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I Introduction

This document contains a set of guidelines for the tests that should be performed in the course of Field Test and Lab Test carried out on a Terminal Device.

Field Tests are tests undertaken during later phases of the terminal development against a real live deployed network (i.e. in the field) to prove of a feature or technology.

Lab Tests are tests undertaken during later phases of the terminal development against laboratory based network components, representative of a real deployed network, to prove a feature or technology.

Field Tests are required to ensure confidence in the performance of Terminal Devices in the operational network environment. Lab Tests usually complement Field Tests for scenarios which cannot be easily executed in a live network.

Field Tests have proven to be a valuable test tool, which exercise terminals under live conditions. Field Tests do address the terminal behaviour in a dynamic environment, which cannot be achieved by simulator tests under laboratory conditions.

Additionally experience has shown that comparable results are achieved in multiple network(s) infrastructures.

Last, but not least, Field Tests do give an insight into customer experience/satisfaction which has been, and will be, the main driver for performing Field Tests. This also implies that certain equipment/configuration requirements can be applicable to perform Field Tests.

In order to support the development of Terminal Devices to the maximum extent possible, the GSMA Terminal Steering Group (TSG) has put considerable effort in applying the experience and knowledge of the operator community in to a set of Device Field and Lab Test Guidelines i.e. this document. Due to a continuous stream of innovations, which includes new standards, features and test experiences, this document shall be a living document.

Although it is the Terminal Manufacturer’s responsibility to define their own Field Test procedures, TSG do believe that the Device Field and Lab Test Guidelines will assist them to achieve an operational process.

It is assumed that Field Tests shall be performed without direct support from the network operator. However TSG and its operator delegates do offer their assistance, if required by any Manufacturer in terms of drafting Field and/or Lab Tests, providing network specific information, etc.

In order to provide visibility on the applicability, extent and the result of Field and/or Lab Tests conducted on a Terminal Device, Annex G has been included in this document.

II Contents

The main part of the document consists of nine annexes.

Annex A contains the description of test scenarios for a 2G/2.5G GSM Terminal Device, and is divided into the following sections:

1 Cell selection/reselection
2 Network Selection
3 Handover
4 Location updating
5 Fax calls
6 Data calls
7 VOID (before: SIM Management)
8 VOID (before: SIM Application Toolkit)
9 GPRS
10 EGPRS
11 A5/3 Ciphering.

**Annex B** contains the description of test scenarios for a W-CDMA Single RAT (=Radio Access Technology) or Multi RAT User Equipment (UE), is counted from section 20 upwards in order to differentiate them from the 2G/2.5G test scenarios and is divided into the following sections:

- 20 System Access & Registration
- 21 Physical Radio Layer FDD
- 22 Mobility
- 23 PS/CS Data
- 24 Multicall and Multi RAB CS-PS
- 25 HSPA.

**Annex C** contains the description of test scenarios for an E-UTRA Single RAT (=Radio Access Technology) or Multi RAT User Equipment (UE), is counted from section 30 upwards in order to differentiate them from the 2G/2.5G and W-CDMA test scenarios and is divided into the following sections:

- 30 System Access & Registration
- 31 Mobility
- 32 PS Data
- 33 VOID (before: UICC/USIM Aspects)
- 34 E-UTRA Voice
- 35 SMS over E-UTRA.

**Annex D** contains the description of test scenarios for RAT independent Services, is counted from section 40 upwards and is divided into the following sections:

- 40 Basic Voice Calls CS
- 41 Short Message Service (SMS)
- 42 Supplementary services
- 43 Multimedia Message Service (MMS)
- 44 Browsing
- 45 Circuit Switched Multimedia Telephony (Video Telephony)
- 46 JAVA and J2ME
- 47 Streaming
- 48 Camera Interworking
- 49 E-Mail Sending/Receiving
- 50 DRM Usability
- 51 IP Multimedia Subsystem (IMS)
- 52 IPv6
- 53 Identification of Network Names
- 54 Test of Ciphering Indicator
- 55 Rich Communication Suite (RCS)
- 56 Steering of Roaming (Managed Roaming), Reject Cause #17 ‘Network Failure’
- 57 (U)ICC with SIM and USIM
Annex E contains the description of test scenarios for Additional Terminal Performance Aspects, is counted from section 60 upwards and is divided into the following proposed sections:

60 Operation in areas of poor signal
61 Speech quality
62 General performance monitoring.

Annex F contains the description of test scenarios for Services based on non-3GPP Radio Access Technologies, is counted from section 80 upwards and is divided into the following proposed sections:

80 Digital Video Broadcasting for Handheld Terminals (DVB-H)
81 Generic Access Network (GAN)
82 Global Positioning System (GPS).

Annex G contains an embedded classification and proforma table, which identifies whether an individual test scenario is a Field Test or a Lab Test or both. Furthermore, this table can be completed by the personnel carrying out the tests, in order to indicate the results of the tests.

Annex H contains a Glossary defining terms used in this document.

Annex I contains a Change Request form which shall be used to add or delete a test scenario or to modify this PRD.


### III General

The Field and/or Lab Tests in this document may be performed in any order that is convenient. Only the features supported by the DUT shall be tested.

It is recommended to use a logging tool, if available, to take log files when running the tests. The log files and their indication of network conditions/behaviour during the tests will help to remove any ambiguity that may come out of the test results.

Also more specifically about the performances tests, it is recommended to run the tests with the terminal to be certified and with a reference terminal such as, for instance, a competitive terminal available on the market. The behaviour of the reference platform will help to remove any ambiguity about the test results.

### IV Classification of Individual Test Scenarios

Every individual test scenario is classified in Field Test, Lab Test or both. This classification should adhere to the following criteria:

**Field Test only:**

- Confidence is only given that this feature works correctly when it has been tested in the field on real live commercial networks.
- It is possible to execute this test in the field (assuming there are live commercial network deployments).
- The only exception to this rule is when a vendor wishes to test a feature for which there are no commercial network deployments. In this case the feature MAY be lab tested for the purpose of gaining some basic confidence in the feature. If this option is used by the vendor then only a ‘provisional pass’ of the test can be achieved and this must clearly be marked in the vendors test report.

**Lab Test only:**

- Technically, it is only practical for this test to be executed in a lab.
• Executing this test in the lab MAY not give the same level of confidence that the feature will work correctly on real live networks, however it may provide some basic confidence in the feature.

• For the identification of absolute performance of the handset, it is better to perform this test in a controlled (Lab-) environment, where resources are allocated only for the handset.

Both, Field Test and Lab Test:

• If there are severe practical difficulties in executing this test in the field then this test MAY be executed in a lab.

• There is equal confidence in the proper function of this feature regardless of whether it is tested in the Field or Lab environment. Passing the test in the lab is therefore equally valid as passing the test in the field.

The individual classification of a test scenario is listed in Annex G.

V References

The following may be cited or referenced in this document.

1. 3GPP Technical Specifications and Technical Reports (GSM xx.yy, TS xx.yyy, TR xx.yyy)
   Available via http://www.3gpp.org
2. OMA Technical Specifications
   Available via http://www.openmobilealliance.org
3. ETSI Technical Specifications
   Available via http://www.etsi.org
4. Global Certification Forum PRDs
   Available via http://www.globalcertificationforum.org
5. GSM Association PRDs
   - TSG Technical Notes (TN.xx)
   - TSG PRDs (TS.xx)
Annex A: Detailed Test Procedures for a 2G/2.5G Terminal Device

This Annex contains the detailed procedures that are recommended to be used for tests of a 2G/2.5G Terminal Device.

1 Cell selection/reselection

1.1 Cell selection (new SIM)

For the Cell selection (new SIM) test, the following default settings of the SIM should be used.

<table>
<thead>
<tr>
<th>File</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{EF}_{\text{FPLMN}} (Forbidden PLMNs)</td>
<td>Length: 12 Bytes</td>
</tr>
<tr>
<td></td>
<td>Format (HEX):</td>
</tr>
<tr>
<td></td>
<td>Bytes 1-3:</td>
</tr>
<tr>
<td></td>
<td>Bytes 4-6:</td>
</tr>
<tr>
<td></td>
<td>Bytes 7-9:</td>
</tr>
<tr>
<td></td>
<td>Bytes 10-12:</td>
</tr>
<tr>
<td>\text{EF}_{\text{LOCI}} (Location information)</td>
<td>File size: 11 Bytes</td>
</tr>
<tr>
<td></td>
<td>Default values:</td>
</tr>
<tr>
<td></td>
<td>Bytes 5-9 (HEX):</td>
</tr>
<tr>
<td></td>
<td>Byte 10 (HEX):</td>
</tr>
<tr>
<td></td>
<td>(Periodic LU Time = &quot;the timer is not running&quot;)</td>
</tr>
<tr>
<td></td>
<td>Byte 11 (BIN):</td>
</tr>
<tr>
<td></td>
<td>(Location Update Status = &quot;not updated&quot;)</td>
</tr>
<tr>
<td>\text{EF}_{\text{BCCH}} (Broadcast control channels)</td>
<td>File size: 16 Bytes</td>
</tr>
<tr>
<td></td>
<td>Default values:</td>
</tr>
<tr>
<td></td>
<td>(BIN) Bytes 1-2:</td>
</tr>
<tr>
<td></td>
<td>Bytes 3-4:</td>
</tr>
<tr>
<td></td>
<td>Bytes 5-6:</td>
</tr>
<tr>
<td></td>
<td>Bytes 7-8:</td>
</tr>
<tr>
<td></td>
<td>Bytes 9-10:</td>
</tr>
<tr>
<td></td>
<td>Bytes 11-12:</td>
</tr>
<tr>
<td></td>
<td>Bytes 13-14:</td>
</tr>
<tr>
<td></td>
<td>Bytes 15-16:</td>
</tr>
</tbody>
</table>

Description
Basic cell selection when the MS is switched on, MS shall select a suitable cell.

Related GSM core specifications
TS 03.22 subclause 3.2.1 (all 3GPP Releases)

Reason for test
Unless the MS correctly selects a cell, no service is possible

Initial configuration
MS is switched off.

Test procedure
Insert a new SIM with default settings, turn on the phone, check that a cell is selected within an appropriate time.

Expected behaviour
MS selects a suitable cell.
1.2 Cell reselection

Description
Basic cell reselection, when entering the coverage area of a new cell, MS shall select a new suitable cell.

Related GSM core specifications
TS 03.22 sub clause 3.2.1 (all 3GPP Releases)

Reason for test
Unless the MS correctly reselects a cell, no service is possible after moving from the initially selected cell.

Initial configuration
MS in idle mode, camped on a suitable cell.

Test procedure
1. Move to the coverage area of a different cell. Ensure that the MS performs a reselection as appropriate.
2. Repeat procedure 1 (from the condition of no service), but entering a cell in a different location area.
3. Repeat procedure 1 (from the condition of no service), but entering a cell which is in a different band (applicable to dual-band mobiles only)
4. Repeat procedure 1 (from the condition of no service), but entering a cell which has channels in the EGSM band (applicable to EGSM mobiles only)

Expected behaviour
After each procedure, the MS performs a cell reselection.

1.3 Cell selection recovering from “no service” state

Description
MS shall select a suitable cell on leaving an area of no coverage.

Related GSM core specifications
TS 03.22 (up to R98), TS 23.122 (for R99 onwards)

Reason for test
Unless the MS correctly selects a cell, no calls can be made or received on leaving an area of no coverage.

Initial configuration
MS in idle mode, in an area of coverage, attached to the network.

Test procedure
1. Enter an area of no coverage; the MS shall not be implicit detached from the network.
2. Re-enter the area covered by the same cell as left before. Ensure that it is selected within the appropriate time.
3. Repeat procedures 1 & 2, but entering a different cell of the same location area.
4. Repeat procedures 1& 2, but entering a cell in a different location area.
5. Repeat procedures 1 & 2, but entering a cell which is in a different band (applicable to dual-band mobiles only)
6. Repeat procedures 1 & 2, but entering a cell which has channels in the EGSM band (applicable to EGSM mobiles only)

In each case, ensure that the MS can receive a call.
Expected behaviour
The MS performs a cell selection and can receive a call following the cell selection.

1.4 Emergency camping

Description
Cell selection where there is an acceptable cell, but there is no suitable cell. MS shall select an acceptable cell.

Related GSM core specifications
TS 03.22 (up to R98), TS 23.122 (for R99 onwards)

Reason for test
Unless the MS correctly selects an acceptable cell in the absence of a suitable cell, emergency calls will not be possible.

Initial configuration
MS in idle mode, camped on a suitable cell.

Test procedure
Enter an area of coverage where there are no suitable cells (only acceptable cells). Ensure that the MS indicates that emergency service only is available.

Expected behaviour
The MS performs a cell selection and indicates that only emergency service is available.

1.5 Cell selection after emergency camping

Description
Cell selection where there is a suitable cell, moving from an area where there were only acceptable cells (only emergency service is available). MS shall select a suitable cell.

Related GSM core specifications
TS 03.22 (up to R98), TS 23.122 (for R99 onwards)

Reason for test
Unless the MS correctly selects a suitable cell, no service is possible on leaving an area of emergency coverage.

Initial configuration
MS in idle mode, camped on a suitable cell.

Test procedure
1. Move outside the coverage of the suitable cell, to an area where only acceptable cells are available. Ensure that the MS indicates that only emergency service is available.
2. Move back to the area covered by the same suitable cell and check that the MS performs a cell selection and that full service is available.
3. Repeat procedures 1 & 2, but entering the coverage area of a different suitable cell. Ensure that the MS performs a selection as appropriate.
4. Repeat procedures 1 & 2, but entering a suitable cell in a different location area.
5. Repeat procedures 1 & 2, but entering a suitable cell which is in a different band (applicable to dual-band mobiles only).
6. Repeat procedures 1 & 2, but entering a suitable cell which has channels in the EGSM band (applicable to EGSM mobiles only).
Expected behaviour
After each procedure, the MS performs a cell selection and indicates that full service is available.

2 Network Selection

2.1 Release 97 Network Selection

The tests in this section apply for Release 97 devices only.

2.1.1 Automatic Network selection; with information on preferred PLMN list

Description
If in automatic network selection mode, on being switched on, the MS shall perform an automatic network selection. The MS shall select the next available GSM network saved on the highest position of the Preferred PLMN list of the SIM card, when the HPLMN or the last registered PLMN is not available.

Related GSM core specifications
TS 22.011, sub clause 3.2.2.2

Reason for test
To ensure that the automatic network selection procedure is correctly performed when roaming away from the HPLMN.

Test Procedure to be performed
The following Release 99 Network Selection test case shall be performed for Release 97 as well:

- 2.2.1.1 Device selects a prioritised network (PLMNsel List on the SIM(<=rel98))

2.1.2 Automatic Network selection; without information on preferred PLMN list, RX_{Lev} > -85dBm

Description
If in automatic network selection mode and without a preferred PLMN list and when the HPLMN or the last registered PLMN is not available, the MS shall randomly select a GSM network, chosen out of a list of networks in which all networks are represented with a field strength better than –85 dBm. (If the received field strength is less than –85 dBm, the network with the highest field strength shall be selected).

Related GSM core specifications
TS 22.011, sub clause 3.2.2.2

Reason for test
To ensure that the automatic network selection procedure is correctly performed when roaming away from the HPLMN.

Test Procedure to be performed
The following Release 99 Network Selection test case shall be performed for Release 97 as well:

- 2.2.2.1 Automatic Network selection; without information on preferred PLMN list

2.1.3 Periodic HPLMN searching when in National Roaming

Description
If in automatic network selection mode, and roaming on a VPLMN in the home country, the MS should periodically attempt to select the HPLMN.
Related GSM core specifications
TS 23.122, sub clause 4.4.3.3

Reason for test
To ensure that the periodic home network searching procedure is correctly performed when in national roaming.

Initial configuration
MS is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN, and registered on a VPLMN in the home country. The SIM card shall have a national roaming access to another national network; the SIM card shall have the HPLMN timer set to a value between 6 and 30 minutes.

Test procedure
Move the terminal to an area where the HPLMN is present, while it is still in coverage of the VPLMN.

Expected behaviour
The terminal shall select the HPLMN in a time not greater than the time settled on the HPLMN timer.

2.1.4 Automatic network selection; available network stored in EF_LOCI

Description
If in automatic network selection mode, and roaming in a foreign country where there are different suitable PLMNs, the MS shall select on power on the last used PLMN (that is stored in the EF_LOCI field on the SIM card), irrespective of the configuration of the preferred PLMN list and the availability of the HPLMN.

Related GSM core specifications
TS 23.122, sub clause 4.4.3.1

Reason for test
To ensure that the last used PLMN is automatically selected at power when in international roaming.

Initial configuration
MS is switched on, in automatic network selection mode, registered on a VPLMN, which is not stored on the preferred PLMN list, in a foreign country. The SIM card shall have an international roaming access to different suitable networks in the visited country. Both, networks on the preferred PLMN list and the HPLMN shall be available.

Test procedure
1. Switch off the MS, then switch it on. Verify that the last used PLMN is selected.
2. Switch off the MS, then move to an area where the last used PLMN is received with a signal strength less than that of other PLMNs. Switch on the MS and verify that the last used PLMN is selected.
3. Switch off the MS, then move to an area covered by another cell of the last used PLMN. Switch on the MS and verify that the last used PLMN is selected.
4. Switch off the MS, then move to an area covered by a cell in another location area of the last used PLMN. Switch on the MS and verify that the last used PLMN is selected.
5. Switch off the MS, then move to an area covered by a cell which is in a different band of the last used PLMN. Switch on the MS and verify that the last used PLMN is selected (applicable to dual-band mobiles only).
6. Switch off the MS, then move to an area covered by a cell which has channels in the EGSM band of the last used PLMN. Switch on the MS and verify that the last used PLMN is selected (applicable to EGSM mobiles only).

Expected behaviour
After each procedure, the MS shall always select the last used PLMN.
2.2 Release 99 Network Selection

The tests in this section apply for Release 99 GSM devices only.

Most of the tests in this section require special field test UICCs with SIM where the content of the PLMN Selector EF\_OPLMNwAcT are set by the operator as defined in the test. For Field Test UICCs Steering of Roaming (SoR) shall not be activated.

2.2.1 Automatic Mode, at power on

These network selection tests can be performed either as field tests (Procedure A) or on a System Simulator (Procedure B). It is preferable to run the tests more than once. Because of consistency, the initial conditions shall be restored if the same test is repeated.

2.2.1.1 Device selects a prioritised network (PLMNsel List on the SIM (<=rel98))

Description

Verification that the device correctly selects a designated and prioritised network.

Remark: The SIM shall be compliant to Rel-98 or earlier

Note: This is a reduced version of UMTS test 20.6.1.1

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

The purpose of the test is to ensure that the device is reading the data from EF\_PLMNsel on the SIM and uses it correctly.

Initial conditions

Initial conditions for Procedure A

The SIM card shall have a CS/PS enabled for roaming with access to all available networks.

The device is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

Initial conditions for Procedure B

A system simulator with at least 2 GSM PLMNs is used.

A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.

A SIM (compliant to Rel-98 or earlier) with the same prioritised network located in the last entry of EF\_PLMNsel.

The device is switched off, in automatic network selection mode.

Initial conditions for the SIM card (both Procedures)

The SIM card shall support preferably 64 (but not less than 32) entries on the Preferred PLMN list.

<table>
<thead>
<tr>
<th>Location Information (EF_LOCI)</th>
<th>FF FF FF FF FF FF FF FF FF 00 00 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden PLMN (EF_PLMN)</td>
<td>FF FF FF FF FF FF FF FF FF FF FF FF</td>
</tr>
<tr>
<td>Broadcast Control Channels (EF_BCCH)</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>PLMN Selector (EF_PLMNsel)</td>
<td>MCC xxx / MNC yy on the last position, all other fields are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
</tbody>
</table>

Note: xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.
Test procedure

The test can be performed in a live network or a system simulator. The reason for using a system simulator is simply that the network conditions (i.e., received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

**Procedure B (Alternative test performed on a system simulator)**

The device is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way that the device would receive the signal strength for GSM better than –85 dBm.

Expected behaviour

The device shall select the prioritised network in the EFPLMNsel and ignore non-prioritised PLMNs.

### 2.2.1.2 Device selects a prioritised network (User controlled PLMNwAcT List on the SIM/USIM (>=rel99))

**Description**

Verification that the device correctly selects a designated and prioritised network.

Remarks: A UICC with SIM and optionally USIM is used for this test. The SIM shall contain EF\_PLMNsel, EF\_PLMNwAcT and EF\_OPLMNwAcT.

Note: This is a reduced version of UMTS test 20.6.1.2

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

The purpose of the test is to ensure that the device is reading the data from EF\_PLMNwAcT on the SIM and using it correctly.

**Initial conditions**

**Initial conditions for Procedure A**

At least the preferred network and a second PLMN (Network B) is available.

The SIM card shall be CS/PS enabled for roaming with access to all available networks.

The device is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

**Initial conditions for Procedure B**

A system simulator with at least 2 GSM PLMNs is used.

A Prioritised Network BCCH (amongst other non-prioritised networks BCCH) is broadcasted.

One UICC (either with SIM only or with both SIM and USIM) (compliant to Rel-99 or later) with the prioritised network located in the last entry of EF\_PLMNwAcT / EF\_OPLMNwAcT is required.

The device is switched off, in automatic network selection mode.

**Initial conditions for the UICC (both Procedures)**

The SIM card shall support preferably 64 (but not less than 32) entries on the EF\_PLMNsel and 50 (but not less than 32) entries on the EF\_PLMNwAcT and EF\_OPLMNwAcT.

| Location Information (EF\_LOCI): FF FF FF FF FF FF FF 00 00 00 01 |
Forbidden PLMN (EF\textsubscript{PLMN}): FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Broadcast Control Channels (EF\textsubscript{BCH}): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

PLMN Selector (EF\textsubscript{PLMNsel})

The MCC xxx / MNC yy of the Preferred PLMN is put on the last position of the following PLMN Selector:

<table>
<thead>
<tr>
<th>UICC PLMN Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM EF PLMNsel</td>
</tr>
</tbody>
</table>

All other fields in EF\textsubscript{PLMNsel} are filled with network codes corresponding to networks not available at the test location.

Access Technology (2 bytes, set to 80 80)

Note: xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.

Test procedure

The test can be performed in a live network or optionally on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

**Procedure B (Alternative test performed on a system simulator)**

The device is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the device receives the signal strength for GSM better than –85 dBm.

Expected behaviour

The device shall select the prioritised PLMN network and ignore the non-prioritised PLMNs.

2.2.1.3 Device selects a prioritised network (Operator controlled OPLMNwAcT List on the SIM (>=rel99))

**Description**

Verification that the device correctly selects a designated and prioritised network.

**Remarks:** A UICC with SIM and optionally USIM is used for this test. The SIM shall contain EF\textsubscript{PLMNsel}, EF\textsubscript{PLMNwAcT} and EF\textsubscript{OPLMNwAcT}.

**Note:** This is a reduced version of UMTS test 20.6.1.3

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

The purpose of the test is to ensure that the device is reading the data from EF\textsubscript{OPLMNwAcT} on the UICC with SIM and uses it correctly.

**Initial conditions**

**Initial conditions for Procedure A**

At least the preferred network and a second PLMN (Network B) is available.
The SIM card shall CS/PS enabled for roaming with access to all available networks.
The device is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

Initial conditions for Procedure B
A system simulator with at least 2 GSM PLMNs is used.
A Prioritised Network BCCH (amongst other non-prioritised networks BCCH) is broadcasted.
One UICC (either with SIM only or with both SIM and USIM) (compliant to Rel-99 or later) with the prioritised network located in the last entry of EF_{PLMNwAcT}/EF_{OPLMNwAcT} is required.
The device is switched off, in automatic network selection mode.

Initial conditions for the UICC (both Procedures)
The SIM card shall support preferably 64 (but not less than 32) entries on the EF_{PLMNsel} and 50 (but not less than 32) entries on the EF_{PLMNwAcT} and EF_{OPLMNwAcT}.

<table>
<thead>
<tr>
<th>Location Information (EF_{LOC}):</th>
<th>FF FF FF FF FF FF FF FF 00 00 00 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden PLMN (EF_{FPLMN}):</td>
<td>FF FF FF FF FF FF FF FF FF FF FF FF</td>
</tr>
<tr>
<td>Broadcast Control Channels (EF_{BCCH}):</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>PLMN Selector (EF_{PLMNwAcT})</td>
<td>The MCC xxx/MNC yy of the Preferred PLMN must NOT be stored in EF_{PLMNwAcT}</td>
</tr>
<tr>
<td>PLMN Selector (EF_{OPLMNwAcT})</td>
<td>The test procedure shall be performed with a UICC (either with SIM only or with both SIM and USIM) The MCC xxx/MNC yy of the Preferred PLMN is put on the last position of the following PLMN Selector:</td>
</tr>
<tr>
<td></td>
<td>UICC</td>
</tr>
<tr>
<td></td>
<td>SIM</td>
</tr>
<tr>
<td></td>
<td>All other fields are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology (2 bytes, set to 80 80)</td>
</tr>
<tr>
<td></td>
<td>Note: xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.</td>
</tr>
<tr>
<td>PLMN Selector (EF_{PLMNsel})</td>
<td>The MCC/MNC of Network B shall be stored in EF_{PLMNsel}. With this method it is tested that the device ignores EF_{PLMNsel} when EF_{PLMNwAcT} or EF_{OPLMNwAcT} is available.</td>
</tr>
</tbody>
</table>

Test procedure
The test can be performed in a live network or optionally on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

Procedure A (On a feasible location)
The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

Procedure B (Alternative test performed on a system simulator)
The device is powered up.
The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

Expected behaviour
The device shall select the prioritised PLMN and ignore the non-prioritised PLMNs.
2.2.2 Network Re-Selection after regaining Coverage

2.2.2.1 Automatic Network selection; without information on preferred PLMN list

Description

If in automatic network selection mode and without a preferred PLMN list and when the HPLMN or the last registered PLMN is not available, the device shall randomly select a network with sufficient received signal level. These are networks with a received signal strength for GSM better than –85 dBm.

Remarks: A SIM card, a UICC with SIM or a UICC (with SIM and USIM) is used for this test. In all cases EF_{PLMNsel}, EF_{PLMNwACT} and EF_{OPLMNwACT} shall either contain no entries or with PLMNs not present in the field.

Note: This is a reduced version of UMTS test 20.6.2.1

Related GSM core specifications

TS 22.011, sub clause 3.2.2.2

Reason for test

To ensure that the automatic network selection procedure is correctly performed when roaming away from the HPLMN.

Initial configuration

The device is switched off, in automatic selection mode. The EF_{PLMNsel}, EF_{PLMNwACT} or EF_{OPLMNwACT} on the SIM shall not contain PLMNs present in the field. The HPLMN or the last registered PLMN is not available. The SIM/USIM shall have roaming subscription at least with CS access to all available networks. Before each test loop, the following data on the SIM card needs to be set to its default values:

| Location Information (LOCI): | FF FF FF FF FF FF FF 00 00 00 01 |
| Forbidden PLMN: | FF FF FF FF FF FF FF FF FF FF FF FF |
| Broadcast Control Channels: | 00 00 00 00 00 00 00 00 00 00 00 00 |

Initial conditions for Procedure A (On a feasible location)

The test shall be carried out at a location, where not less than 2 networks are available on GSM frequencies with a field strength better than –85 dBm. This can be proved using a reference device with a network monitor.

Initial conditions for Procedure B (Alternative test performed on a system simulator)

The configuration of the system simulator shall be that not less than 2 networks on GSM frequencies with a field strength better than –85 dBm.

Test procedure

**Procedure A**

The device is switched on and the selected network is noted. Afterwards the device is switched off and the SIM is prepared for the next loop as stated above.

**Procedure B**

Before each test loop, the device shall perform successfully a location updating procedure at the system simulator. The selected network is noted. Afterwards the device is switched off and the SIM is prepared for the next loop as stated above.

As it is impossible to check the random balance by repeating the test a few times it will be checked that each available network is at least selected once. When this condition is reached the test loop can be stopped. The device fails the test when at least one network is not selected after repeating the test N times. The maximum number of repetitions N depends on the number of GSM networks, i.e. different number of MCC/MNC combinations:
This table is based on the assumption that after reaching the maximum number of repetition a correctly implemented device would have selected each network at least once with a probability of better than 99%.

### Expected behaviour

After each procedure, the device performs an automatic network selection. The network selection was performed in a random balance. When repeating the procedure N times (as defined above) the device has selected each available network (with a field strength better than –85 dBm for GSM) at least once.

#### 2.2.2.2 Device re-selects a prioritised network after regaining coverage (PLMNsel List on the SIM (<=rel98))

### Description

Verification that the device correctly selects a new prioritised network, after having lost the old VPLMN due to loss of coverage.

> Note: This is a reduced version of UMTS test 20.6.2.2

### Related 3GPP/GSM core specifications

TS 23.122

### Reason for test

This test shall verify that the terminals network selection procedure conforms to the 3GPP Rel-99 Specification.

### Initial configuration

#### Initial conditions for Procedure A

The SIM card shall CS/PS be enabled for roaming with access to all available networks.

The device is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN and camps on VPLMN A.

#### Initial conditions for Procedure B

A system simulator with at least 2 GSM PLMNs is used.

A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.

A SIM (compliant to Rel-98 or earlier) with the same prioritised network located in the last entry of EFPLMNsel.

The device is switched on, in automatic network selection mode and camps on the VPLMN A.

#### Initial conditions for the SIM card (both Procedures)

The SIM card shall support preferably 64 (but not less than 32) entries on the Preferred PLMN list.

<table>
<thead>
<tr>
<th>No of MCC/MNC combinations</th>
<th>Maximum number of repetitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>N</td>
<td>$2/(\log_{10}(n) - \log_{10}(n-1))$</td>
</tr>
</tbody>
</table>

In addition to this shall the HPLMN Search Period Timer be set at least to 30 minutes (“05”)
The device has already successfully selected the prioritised network and if left on, in automatic network selection mode.

Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The device was powered up at a location, where not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around the coverage of VPLMN A gets lost (for all radio access technologies of this PLMN). The device loses the network and searches for a new VPLMN. The location where VPLMN A is lost should be found within EF_HPlPLMN (Higher Priority PLMN search period) after switching on the phone, to prevent the device from searching for a higher prioritised network.

Procedure B (Alternative test performed on a system simulator)

The device is powered up VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The signal level of VPLMN A is changed so the serving network is lost. The device starts searching for a new VPLMN.

Expected behaviour

The device shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.

2.2.2.3 Device re-selects a prioritised network (User controlled PLMNwAct List on the SIM/USIM (>=rel99))

Description

Verification that the device correctly selects a prioritised network, after having lost the old VPLMN due to loss of coverage.

Note: This is a reduced version of UMTS test 20.6.2.3

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

This test shall verify that the network selection conforms to the 3GPP Rel-99 Specification.

Initial configuration

Initial conditions for Procedure A

At least the preferred network and a second PLMN (Network C) is available.

The SIM card shall CS/PS be enabled for roaming with access to all available networks.

The device is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN and camps on VPLMN A.

Initial conditions for Procedure B

A system simulator with at least 2 GSM PLMNs is used.

A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.

One UICC (either with SIM only, or with both SIM and USIM) (compliant to Rel-99 or later) are
required, with the prioritised networks VPLMN A and VPLMN B located in the last two entries of EF_{PLMNwAcT} / EF_{OPLMNwAcT}.

The device is switched on, in automatic network selection mode and camps on the VPLMN A.

**Initial conditions for the UICC (both Procedures)**

The SIM card shall support preferably 64 (but not less than 32) entries on the EF_{PLMNsel} and 50 (but not less than 32) entries on the EF_{PLMNwAcT} and EF_{OPLMNwAcT}.

<table>
<thead>
<tr>
<th>Forbidden PLMN (EF_{FPLMN})</th>
<th>FF FF FF FF FF FF FF FF FF FF FF FF FF</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN Selector (EF_{PLMNwAcT})</td>
<td>The MCC / MNC of VPLMN A is stored on the last but one position. MCC/MNC of VPLMN B is stored on the last position:</td>
</tr>
<tr>
<td>UICC</td>
<td>PLMN Selector</td>
</tr>
<tr>
<td>SIM</td>
<td>EF_{PLMNwAcT}</td>
</tr>
<tr>
<td>All other fields in both EF_{PLMNwAcT} are filled with network codes corresponding to networks not available at the test location.</td>
<td></td>
</tr>
<tr>
<td>Access Technology (2 bytes, set to 80 80)</td>
<td></td>
</tr>
</tbody>
</table>

| PLMN Selector (EF_{PLMNsel}) | The MCC/MNC of Network C shall be stored in EF_{PLMNsel}. With this method it is tested that the device ignores EF_{PLMNsel} when EF_{PLMNwAcT} or EF_{OPLMNwAcT} is available. |

In addition to this the HPLMN Search Period Timer be set at least to 30 minutes ("05")

The device has already successfully selected the prioritised network and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The device was powered up at a location, where not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN) so that the device loses the network and is forced to search for a new network.

**Procedure B (Alternative test performed on a system simulator)**

The device is powered up and VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The signal level of VPLMN A is changed so the serving network is lost. The device starts searching for a new VPLMN.

**Expected behaviour**

The device shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.

2.2.2.4 **Device re-selects a prioritised network (Operator controlled OPLMNwAcT List on the SIM (>=rel99))**

**Description**

Verification that the device correctly selects a prioritised network, after having lost the old VPLMN due to loss of coverage.
Note: This is a reduced version of UMTS test 20.6.2.4

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

This test shall verify that the network selection conforms to the Rel-99 Specification.

Initial configuration

Initial conditions for Procedure A

At least the preferred network and a second PLMN (Network C) is available.

The SIM card shall CS/PS be enabled for roaming with access to all available networks.

The device is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN and camps on VPLMN.

Initial conditions for Procedure B

A system simulator with at least 2 GSM PLMNs is used.

A Prioritised Network BCCH (amongst other non-prioritised networks BCCH) is broadcasted.

One UICC (either with SIM only, or with both SIM and USIM) (compliant to Rel-99 or later) are required, with the prioritised networks VPLMN A and VPLMN B located in the last two entries of EF_PLMNwAcT / EF_QPLMNwAcT.

Device is switched on, in automatic network selection mode and camps on the VPLMN A.

Initial conditions for the UICC (both Procedures)

The SIM card shall support preferably 64 (but not less than 32) entries on the EF_PLMNsel and 50 (but not less than 32) entries on the EF_PLMNwAcT and EF_QPLMNwAcT.

Forbidden PLMN (EF_FPLMN): FF FF FF FF FF FF FF FF FF FF FF FF FF

PLMN Selector (EF_PLMNwAcT)

The MCC / MNC of the Preferred PLMNs VPLMN A and VPLMN B must NOT be stored in EF_PLMNwAcT.

PLMN Selector (EF_QPLMNwAcT)

The MCC / MNC of VPLMN A is stored on the last but one position. MCC /MNC of VPLMN B is stored on the last position:

<table>
<thead>
<tr>
<th>UICC</th>
<th>PLMN Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM</td>
<td>EF_QPLMNwAcT</td>
</tr>
</tbody>
</table>

All other fields in both EF_QPLMNwAcT are filled with network codes corresponding to networks not available at the test location.

Access Technology (2 bytes, set to 80 80)

PLMN Selector (EF_PLMNsel)

The MCC/MNC of Network C shall be stored in EF_PLMNsel. With this method it is tested that the device ignores EF_PLMNsel when EF_PLMNwAcT or EF_QPLMNwAcT is available.

In addition to this the HPLMN Search Period Timer be set at least to 30 minutes ("05")

The device has already successfully selected the prioritised network and if left on, in automatic network selection mode.

Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The device was powered up at a location, where not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference device with a network monitor mode.
While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN) so that the device loses the network and is forced to search for a new network.

**Procedure B (Alternative test performed on a system simulator)**

The device is powered up and VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The signal level of VPLMN A is changed so the serving network gets lost. The device starts searching for a new VPLMN.

**Expected behaviour**

The device shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.

### 2.2.3 Periodic HPLMN searching when in Roaming

#### 2.2.3.1 Device re-selects a prioritised network. HPLMN Timer expires in a coverage area with no higher prioritised network coverage

**Description**

To identify the behaviour of the device if the HPLMN Search Period Timer expires in an area were no prioritised network is available.

*Note:* This is a reduced version of UMTS test 20.6.3.1

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

This test shall verify that the network selection is conforms to Rel-99 Specification.

**Initial configuration**

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where:

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>On the UICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PLMN Selector (EF_{PLMNsel})</td>
<td>• PLMN Selector (EF_{PLMNwAct})</td>
</tr>
<tr>
<td>The MCC / MNC of the Preferred PLMN is put on the last position of the PLMN Selector.</td>
<td>All other fields in all PLMN Selectors (EF_{PLMNwAct}, EF_{OPLMNwAct}) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td>Access Technology for EF_{PLMNwAct} and EF_{OPLMNwAct} (2 bytes, set to 80 80)</td>
<td></td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_{HPPLMN}) be set to 6 minutes ("01")

The device has already successfully selected the prioritised network and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.
The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_HPLMN) to ensure a PLMN background scan is activated.

**Procedure B (Alternative test performed on a system simulator)**

The device is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The tester shall wait HPLMN Search Period Timer (EF_HPLMN) until PLMN background scan is activated.

**Expected behaviour**

It shall be checked that the device stays after expiry of HPLMN Search Period Timer (EF_HPLMN) on the same VPLMN.

### 2.2.3.2 Device re-selects a higher prioritised network when camping on a prioritised network

**Description**

To identify the behaviour of the device when it camps on a prioritised network and the HPLMN Search Period Timer (EF_HPLMN) expires in an area were a higher prioritised network is available.

**Note:** This is a reduced version of UMTS test 20.6.3.2

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

This test shall verify that the network selection conforms to the Rel-99 Specification.

**Initial configuration**

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where:

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>On the UICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN Selector (EF_PLMNsel)</td>
<td>PLMN Selector (EF_PLMNwAcT)</td>
</tr>
</tbody>
</table>

- The MCC / MNC of the Preferred VPLMN A and VPLMN B is put on the last two positions of the PLMN Selector.
- All other fields in all PLMN Selectors (EF_PLMNsel, EF_PLMNwAcT, EF_OPLMNwAcT) are filled with network codes corresponding to networks not available at the test location.
- Access Technology for EF_PLMNwAcT and EF_OPLMNwAcT (2 bytes, set to 80 80)

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_HPLMN) be set to 6 minutes (“01”)

The device has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM. This can be proved using a reference device with a network monitor mode.

While driving around the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device should select VPLMN B.
One drives to a location where both, VPLMN A and VPLMN B are available.
The tester shall wait for a period of time greater than the HPLMN Search Period Timer
(EF_HPLMN) so that a PLMN background scan is activated.

Procedure B (Alternative test performed on a system simulator)

VPLMN B is the only available network. The device is powered up and selects VPLMN
B.
The radio conditions are changed so VPLMN A, VPLMN B and at least one non-
prioritised network(s) is available. VPLMN B should transmit with a higher power than
the other networks but all network should transmit in such a way, that the device would
receive the signal strength for GSM better than –85 dBm.
The tester shall wait HPLMN Search Period Timer (EF_HPLMN) until PLMN background
scan is activated.

Expected behaviour
It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer
(EF_HPLMN).

2.2.3.3 Device re-selects a higher prioritised network when camping on a
non-prioritised network

Description
To identify the behaviour of the device when it camps on a non-prioritised network and the HPLMN
Search Period Timer (EF_HPLMN) expires in an area were a higher prioritised network is available.

Note: This is a reduced version of UMTS test 20.6.3.3

Related 3GPP/GSM core specifications
TS 23.122

Reason for test
This test shall verify that the network selection conforms to the Rel-99 Specification.

Initial configuration
A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>On the UICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PLMN Selector (EF_PLMNsel)</td>
<td>• PLMN Selector (EF_PLMNwAct)</td>
</tr>
<tr>
<td>The MCC / MNC of the Preferred VPLMN A is put on the last position of the PLMN Selector.</td>
<td>All other fields in all PLMN Selectors (EF_PLMNsel, EF_PLMNwAct, EF_OPLMNwAct) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td>Access Technology for EF_PLMNwAct and EF_OPLMNwAct (2 bytes, set to 80 80)</td>
<td></td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_HPLMN) be set to 6 minutes ("01").
The device has already successfully selected the prioritised network VPLMN A and if left on, in
automatic network selection mode.

Test procedure
The test can be performed in a live network or on a system simulator. The reason for using a system
simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device)
can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested
Procedure A (On a feasible location)
The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select a non-prioritised VPLMN.

One drives to a location where both, VPLMN A and the non-prioritised VPLMN are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_{HPPLMN}) so ensure a PLMN background scan is activated.

Procedure B (Alternative test performed on a system simulator)
A non-prioritised VPLMN is the only available network. The device is powered up and selects this VPLMN.

The radio conditions are changed so VPLMN A and at least two non-prioritised network(s) is available. The VPLMN the device camps on should transmit with a higher power than the other networks but all network should transmit in such a way, that the Device would receive the signal strength for GSM better than –85 dBm.

The tester shall wait HPLMN Search Period Timer (EF_{HPPLMN}) until PLMN background scan is activated.

Expected behaviour
It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF_{HPPLMN}).

2.2.3.4 Device re-selects a prioritised network - Different Values of the HPLMN Timer / No HPLMN Search timer defined

Description
Verification that the device re-selects a prioritised network according to the HPLMN timer.

Note: This is a reduced version of UMTS test 20.6.3.4

Related 3GPP/GSM core specifications
TS 23.122

Reason for test
Different values for the HPLMN timer should not have an effect on the re-selection procedure. A default value shall be taken if no HPLMN Search Timer available.

Initial configuration
The following three cards are required:

- A SIM (ICC)
- A UICC with SIM only or a UICC with SIM and USIM

Each of these three cards shall have one of the following different values for the HPLMN Search Timer:

- 30 minutes
- 18 minutes
- HPLMN Search Timer not available (default value 60 minutes apply)

Test procedure
Scenario A:
Test executed as defined below with defined value 30 min
Scenario B:
Test executed as defined below with defined value 18 min

Scenario C:
Test executed as defined below with No HPLMN defined

For each of the above scenarios the following test shall be performed:

Procedure A (On a feasible location):
The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select a non-prioritised VPLMN.

One drives to a location where both, VPLMN A and the non-prioritised VPLMN are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EFHPLMN) so ensure a PLMN background scan is activated.

Procedure B (Alternative test performed on a system simulator):
A non-prioritised VPLMN is the only available network. The device is powered up and selects this VPLMN.

The radio conditions are changed so VPLMN A and at least two non-prioritised network(s) is available. The VPLMN the device camps on should transmit with a higher power than the other networks but all network should transmit in such a way, that the Device would receive the signal strength for GSM better than –85 dBm.

The tester shall wait HPLMN Search Period Timer (EFHPLMN) until PLMN background scan is activated.

Expected behaviour
It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EFHPLMN).

2.2.3.5 HPLMN Timer expires during an on-going Voice call

Description
Verification that the device re-selects a higher priority network after call release if the HPLMN timer expires during an on-going voice call.

Note: This is a reduced version of UMTS test 20.6.3.5

Related GSM core specifications
TS 23.122

Reason for test
The network re-selection shall be performed after the voice call has been terminated.

Initial configuration
A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>The MCC / MNC of the Preferred VPLMN A and VPLMN B are stored in the last two positions of the PLMN Selector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PLMN Selector (EFPLMNsel)</td>
<td>All other fields in all PLMN Selectors (EFPLMNsel, EFPLMNwAcT, EFOPLMNWAcT) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td>On the UICC</td>
<td>Access Technology for EFPLMNwAcT and EFOPLMNWAcT (2 bytes, set to 80 80)</td>
</tr>
<tr>
<td>• PLMN Selector (EFPLMNwAcT)</td>
<td></td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For
this card the HPLMN Search Period Timer (EF_HPLMN) be set to 6 minutes ("01").

The device has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.

The tester starts a voice call and waits until HPLMN Search Period Timer (EF_HPLMN) is expired. Afterwards the call is released.

Procedure B (Alternative test performed on a system simulator)

VPLMN B is the only available network. The device is powered up and selects VPLMN B.

The radio conditions are changed so VPLMN A, VPLMN B and at least one non-prioritised network(s) is available. VPLMN B should transmit with a higher power than the other networks but all network should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The tester starts a voice call and waits until HPLMN Search Period Timer (EF_HPLMN) is expired. Afterwards the call is released.

Expected behaviour

It shall be checked that the voice call is active while HPLMN Search Period Timer (EF_HPLMN) expired. After releasing the call the device shall re-select the higher priority PLMN A.

2.2.3.6 HPLMN Timer expires during an on-going data connection (GPRS)

Description

Verification that the device re-selects a higher priority network after releasing a PDP context if the HPLMN timer expires during an on-going packet connection.

Note: This is a reduced version of UMTS test 20.6.3.6

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

The network re-selection shall be performed after the PDP context has been disconnected.

Initial configuration

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where
On the SIM
• PLMN Selector (EF\textsubscript{PLMNsel})

On the UICC
• PLMN Selector (EF\textsubscript{PLMNwAcT})

The MCC / MNC of the Preferred VPLMN A and VPLMN B shall be stored in the last two positions of the PLMN Selector.

All other fields in all PLMN Selectors (EF\textsubscript{PLMNsel}, EF\textsubscript{PLMNwAcT}, EF\textsubscript{PLMNwAcT}) are filled with network codes corresponding to networks not available at the test location.

Access Technology for EF\textsubscript{PLMNwAcT} and EF\textsubscript{PLMNwAcT} (2 bytes, set to 80 80)

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) be set to 6 minutes (“01”)

The device has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the device) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The device is powered up at a location, where not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference device with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.

The tester activates a PDP context and starts data transfer. The HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) expires during data transfer. Afterwards the PDP context is deactivated.

Procedure B (Alternative test performed on a system simulator)

VPLMN B is the only available network. The device is powered up and selects VPLMN B.

The radio conditions are changed so VPLMN A, VPLMN B and at least one non-prioritised network(s) is available. VPLMN B should transmit with a higher power than the other networks but all network should transmit in such a way, that the device would receive the signal strength for GSM better than –85 dBm.

The tester activates a PDP context and starts data transfer. The HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) expires during data transfer. Afterwards the PDP context is deactivated.

Expected behaviour

It shall be checked that the data transfer is on-going while HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) expires and that the PDP context is still active after expiry of the HPLMN Search Period Timer. After deactivation of the PDP context the device shall re-select the higher priority PLMN A.

2.3 Manual Network selection

Description

If in manual network selection mode, the MS shall list all available PLMNs. This behaviour is independent from the content of the preferred PLMN list.

Related GSM core specifications

TS 22.011, sub clause 3.2.2.2
Reason for test
To ensure that the correct list of PLMNs is displayed for the purposes of manual PLMN selection.

Initial configuration
MS switched on, in automatic selection mode.

Test procedure
1. Select the manual network selection mode on the MS and ensure that the list of all available GSM PLMNs is displayed, and that the displayed networks can be selected, even if on the forbidden list.
2. Check that the preferred PLMN list is not changed after the manual network selection.
3. Repeat the test with different entries in the preferred PLMN lists, including the empty list and lists of more than 32 entries.

Expected behaviour
The MS shall display all available GSM PLMNs and it shall perform manual network selection on the chosen network. The preferred PLMN list is not changed after the manual network selection.

2.4 Selection mode following switch off

Description
The MS shall retain its configuration of automatic and manual network selection modes when switched off.

Related GSM core specifications
TS 22.011, sub clause 3.2.2.2

Reason for test
To ensure that the MS retains its configuration of manual and automatic selection modes when switched off.

Initial configuration
MS in idle mode, with automatic network selection mode configured.

Test procedure
1. Change to manual network selection. Turn the MS off and on again. Check that the manual network selection mode is in use.
2. Change to automatic network selection. Turn the MS off and on again. Check that the automatic network selection mode is in use.

Expected behaviour
The MS has the same selection mode when switched on that it had when switched off.

3 Mobility

3.1 Reselections

Description
The DUT should perform reselections without losing service.

Related GSM core specifications
GSM 04.18 sub clause 3
3GPP TS25.304
Reason for test
To ensure that the DUT performs reselections correctly without losing service.

Initial configuration
There must be an appropriate number of GERAN cells available on the same PLMN.

Test procedures (overview)

<table>
<thead>
<tr>
<th>Test Case Number</th>
<th>Test Case Title</th>
<th>GERAN 2G -&gt; 2G (Scenario A)</th>
</tr>
</thead>
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<tr>
<td>3.1.1</td>
<td>GPRS Detached</td>
<td>X</td>
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<tr>
<td>3.1.2</td>
<td>GPRS Attached (No PDP)</td>
<td>X</td>
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<tr>
<td>3.1.3</td>
<td>PDP active (No Transfer)</td>
<td>X</td>
</tr>
<tr>
<td>3.1.4</td>
<td>PDP active (With Transfer)</td>
<td>X</td>
</tr>
<tr>
<td>3.1.5</td>
<td>PDP active (With Transfer) with NACC</td>
<td>X</td>
</tr>
</tbody>
</table>

Scenario A: 2G -> 2G
1. Perform reselections between different 2G cells
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between cells not sharing a MSC.
   - Between cells sharing a Location Area and Routing Area.
   - Between cells not sharing a Location Area and/or a Routing Area.
   - Between cells using the same GSM frequency band.
   - Between cells using a different GSM frequency band.
   - Between cells with and without frequency hopping
   - Between synchronised cells.
   - Between non-synchronised cells.
   - Between cells supporting GPRS and EGPRS.
   - In areas of poor signal strength.

3.1.1  GPRS Detached
Test procedure
1. Perform GPRS detach on DUT (AT+cgatt=0) or use a SIM card without GPRS provisioning.
2. Perform reselections as described in the general scenario above.
3. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
1. Ensure DUT is GPRS detached (GMM IDLE state).
2. Ensure DUT performs reselections as expected and remains in service at all times.
3. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

3.1.2  GPRS Attached (No PDP)
Test procedure
1. Perform GPRS attach on DUT (AT+cgatt=1).
2. Perform reselections as described in the general scenario above.
3. Page (Voice/SMS) the DUT before and after reselections.
Expected Behaviour
1. Ensure DUT is GPRS attached and has no PDP context active (GMM STANDBY state).
2. Ensure DUT performs reselections as expected and remains in service at all times.
3. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

3.1.3 PDP Active (No Transfer)
Test procedure
1. Establish a PDP context on DUT.
2. Block all data traffic.
3. Perform reselections as described in the general scenario above.
4. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
1. Ensure DUT has PDP context established successfully.
2. No data traffic on-going (GMM STANDBY state).
3. Ensure DUT performs reselections as expected and remains in service at all times.
4. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

3.1.4 PDP Active (With Transfer)
Test procedure
1. Set up a PC Dialup or Tethering connection on DUT and download a large file via FTP. Simultaneously set up a PC Dialup or Tethering connection on a Reference Client that has the same Multislot Class as the DUT and download a large file via FTP.
2. Perform reselections as described in the general scenario above.
3. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
1. DUT is successfully in PC Dialup or tethered state and actively downloading data (GMM READY state). Reference Client is successfully in PC Dialup or tethered state and actively downloading data (GMM READY state).
2. Ensure DUT performs reselections as expected and remains in service at all times. The data session should resume after the reselection within 8 seconds and the data rate shall be as expected for the data bearer type assigned by the network throughout the test. The throughput on DUT and Reference Client should be comparable (i.e. within 10%).
3. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

3.1.5 PDP Active (With Transfer) with NACC
Test procedure
1. Set up a PC Dialup or Tethering connection on DUT and download a large file via FTP. Simultaneously set up a PC Dialup or Tethering connection on a Reference Client that has the same Multislot Class as the DUT and download a large file via FTP.
2. Perform reselections as described in the general scenario above.
3. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
1. DUT is successfully in PC Dialup or tethered state and actively downloading data (GMM READY state). Reference Client is successfully in PC Dialup or tethered state and actively downloading data (GMM READY state).
2. Ensure DUT performs reselections as expected and remains in service at all times. The data session should resume after the reselection within 2 seconds and the data rate shall be as expected for the data bearer type assigned by the network throughout the test. The throughput on DUT and Reference Client should be comparable (i.e. within 10%).

3. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

### 3.2 Dedicated Mode Handovers

#### Description

DUT should perform handovers as requested by the network, and behave as expected from the user perspective without losing service.

#### Related core specifications

GSM 04.18 sub clause 3

#### Reason for test

To ensure DUT performs handovers correctly without losing service.

#### Initial configuration

There must be an appropriate number of 2G cells available on the same PLMN.

#### Test procedures (Overview)

<table>
<thead>
<tr>
<th>Test Case Number</th>
<th>Test Case Title</th>
<th>GERAN</th>
<th>WB-AMR</th>
<th>A5/3 Ciphering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intra-Band (Scenario A)</td>
<td>Inter Band (Scenario B)</td>
<td>2G(WB) → 2G(WB) (Scenario C)</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Voice NB</td>
<td>X</td>
<td>X</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Voice WB-AMR</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3.2.3</td>
<td>CS Data</td>
<td>X</td>
<td>X</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Scenario A: Intra-Band**

1. Perform handover between different 2G cells using the same Frequency Band.
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between cells of the same BTS.
   - Between cells of different BTS sharing the same BSC.
   - Between cells of different BSCs sharing the same MSC.
   - Between cells of different MSCs.
   - Between synchronised cells
   - Between non-synchronised cells
   - Between cells with and without frequency hopping
   - Between cells supporting different codec types.

**Scenario B: Inter Band**

1. Perform handover between different 2G cells using a different Frequency Band.
2. Ideally, the test route should contain as many of the scenarios as possible:
- Between cells of the same BTS.
- Between cells of different BTS sharing the same BSC.
- Between cells of different BSCs sharing the same MSC.
- Between cells of different MSCs.
- Between synchronised cells
- Between non-synchronised cells
- Between cells with and without frequency hopping
- Between cells supporting different codec types.

**Scenario C: 2G(WB) -> 2G(WB)**
1. Perform handover between different 2G cells supporting WB-AMR.
2. Ensure the call is continuously performed as Tandem Free WB-AMR call.

**Scenario D: 2G(A5/3) -> 2G(A5/3)**
1. Perform handover between different 2G cells supporting A5/3 ciphering.
2. Ensure DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in HANDOVER COMMAND from the network.

**Scenario E: 2G(A5/3) -> 2G(A5/1)**
Perform handover from a 2G cell supporting A5/3 ciphering to a 2G cell supporting A5/1 ciphering only.

**Scenario F: 2G(A5/1) -> 2G(A5/3)**
1. Perform handover from a 2G cell supporting A5/1 ciphering only to a 2G cell supporting A5/3 ciphering.
2. Ensure DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in HANDOVER COMMAND from the network.

### 3.2.1 Voice NB

**Test procedure**
1. Set up NB MO Voice call (AMR-FR, AMR-HR, EFR, FR or HR) to Client 1 in a static location on the desired RAT.
2. Perform the instruction of the desired scenario.
3. End NB Voice call on DUT.
4. Page (Voice / SMS) the DUT.

**Expected Behaviour**
1. NB Voice call set up successfully.
2. The call should remain active at all times, without any loss or degradation of Voice quality.
3. Ensure NB Voice call is ended.
4. DUT can be paged successfully.

### 3.2.2 Voice WB-AMR

**Test procedure**
1. Set up WB-AMR MO Voice call to Client 1 in a static location on the desired RAT.
2. Follow the instruction of the desired scenario.
3. End WB-AMR Voice call on DUT.
4. Page (Voice / SMS) the DUT.
Expected Behaviour
1. WB-AMR Voice call set up successfully.
2. The call should remain active at all times, without any loss or degradation of Voice quality.
3. Ensure WB-AMR Voice call is ended.
4. DUT can be paged successfully.

3.2.3 CS Data

Test procedure
1. Set up CS Data call in a static location on the desired RAT.
2. Perform the instruction of the desired scenario.
3. End CS Data call on DUT.
4. Page (Voice / SMS) the DUT.

Expected Behaviour
1. CS Data call set up successfully.
2. The call should remain active at all times.
3. Ensure CS Data call is ended.
4. DUT can be paged successfully.

4. Location Updating

4.1 Normal Location Updating

4.1.1 Normal Case (No GPRS attach)

Description
The MS can successfully perform a normal location update after camping onto a serving cell with a different LAI.

Related 3GPP core specifications
3GPP TS 24.008 4.4.1 (Location updating procedure)

Reason for test
To verify that the MS can successfully perform a normal location update after camping onto a serving cell with a different LAI.

Initial configuration
The MS is attached in Circuit mode

Ensure that the device is not GPRS attached.

Test procedure
1. Move the MS from the initial cell into a cell with a different LAI till the MS performs a cell reselection.

2. The MS shall send a LOCATION UPDATE REQUEST message to the network. Check whether the “location updating type” parameter holds the “normal” value.

3. The network shall then send a LOCATION UPDATE ACCEPT message to the MS. This message contains a new TMSI for the MS and the LAI for the new cell.

4. Check that the MS responds to paging in the new cell by calling the MS.
Expected behaviour
The MS performs a ‘Normal Location Update’ procedure and receives an incoming call.

4.1.2 Normal Location Updating with TMSI unknown in VLR

Description
The MS successfully performs a normal location update procedure after camping onto a serving cell with a different LAI and a TMSI which is unknown to the VLR.

Related 3GPP core specifications
3GPP TS 24.008 4.4.1 (Location updating procedure)

Reason for test
To verify that the MS can successfully perform a normal location update after camping onto a serving cell with a different LAI and a TMSI which is unknown to the VLR.

Initial configuration
The MS is attached in Circuit mode.

TMSI unknown in VLR can be provoked by following scenarios:
- Changing PLMNs
- Using two identical (U)SIM cards which are registered in the network at the same time
- Alternatively: Change TMSI and LAI on the (U)SIM to a different but valid figure and then perform an IMSI Attach Procedure.

Test procedure
1. Move the MS from the initial cell into a cell with a different LAI till the MS performs a cell reselection.
2. The MS shall send a LOCATION UPDATE REQUEST message to the network containing a TMSI which is not known by the network. Check whether the “location updating type” parameter holds the “normal” value.
3. Check that the network initiates an Identification Procedure requesting the MS’s IMSI.
4. Check that the MS sends its IMSI to the network.
5. The network shall then send a LOCATION UPDATE ACCEPT message to the MS. This message contains a new TMSI for the MS and the LAI for the new cell.
6. Check that the MS is not indicating loss of coverage.
7. Check that the MS responds to paging in the new cell by calling the MS.

Expected behaviour
The MS performs the ‘Normal Location Update’ procedure (including Identification Procedure) without coverage loss indication and receives an incoming call.

4.2 Periodic Location Area Updating

4.2.1 Periodic Location Area Update successful

Description
The DUT shall successfully perform a Periodic Location Area Update after the T3212 timer has expired.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)
**Reason for test**
To verify the DUT successfully performs a Periodic Location Area Update after the T3212 timer has expired.

**Initial configuration**
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

**Test procedure**
1. Power on DUT (or disable Flight Mode).
2. Leave DUT in Idle until T3212 timer has expired (X minutes).
3. Observe behaviour when T3212 timer has expired.
4. Receive MT Voice Call / MT SMS.

**Expected behaviour**
1. DUT is powered on and T3212 timer commences.
2. DUT is in Idle mode and T3212 timer is running.
3. DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives "Location Update Accept" from the network.
4. MT Voice Call / MT SMS is successful.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>CHANNEL REQUEST</td>
<td>RR connection establishment</td>
</tr>
<tr>
<td>2</td>
<td>⇐</td>
<td>IMMEDIATE ASSIGNMENT</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = periodic</td>
</tr>
<tr>
<td>(4)</td>
<td>⇐</td>
<td>AUTHENTICATION REQUEST</td>
<td>Optional</td>
</tr>
<tr>
<td>(5)</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
<td>Optional</td>
</tr>
<tr>
<td>(6)</td>
<td>⇐</td>
<td>CIPHER MODE COMMAND</td>
<td>Optional</td>
</tr>
<tr>
<td>(7)</td>
<td>➔</td>
<td>CIPHER MODE COMPLETE</td>
<td>Optional</td>
</tr>
<tr>
<td>8</td>
<td>⇐</td>
<td>TMSI REALLOCATION COMMAND</td>
<td>Optional</td>
</tr>
<tr>
<td>9</td>
<td>⇐</td>
<td>LOCATION UPDATING ACCEPT</td>
<td></td>
</tr>
<tr>
<td>(10)</td>
<td>➔</td>
<td>TMSI REALLOCATION COMPLETE</td>
<td>Optional</td>
</tr>
<tr>
<td>11</td>
<td>⇐</td>
<td>CHANNEL RELEASE</td>
<td>RR connection Release</td>
</tr>
</tbody>
</table>

**4.2.2 Reset of T3212 timer**

**Description**
The DUT shall successfully reset its T3212 timer when a) T3212 timer has expired, b) Voice Call is made or received, c) SMS is made or received, d) Supplementary service command is sent.

**Related 3GPP core specifications**
3GPP TS 24.008 4.4.2 (Periodic updating)

**Reason for test**
To verify the DUT successfully resets its periodic location update timer T3212.

**Initial configuration**
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).
Test procedure

Scenario A: T3212 timer expired
1. Power on DUT (or disable Flight Mode).
2. Leave DUT in Idle until T3212 timer has expired (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Scenario B: Voice Call is made or received
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform MO or MT Voice Call. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Scenario C: SMS is sent or received
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform MO or MT SMS. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Scenario D: Supplementary Service command sent
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform Supplementary Service command. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. The T3212 timer is reset at Time B.
3. Confirm T3212 timer expires at Time C. This should be X minutes after Time B.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
4. MT Voice Call / MT SMS is successful.

4.2.3 DUT out of coverage (back in coverage before T3212 expiry)

Description
The DUT shall not reset its T3212 timer when it loses coverage or regains coverage until the T3212 timer has expired.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to out of coverage area. Note the time (Time B).
   Leave DUT out of coverage for ¾ of the T3212 timer value (¾ of X minutes).
3. After ¾ of X minutes, bring DUT back into coverage. Note the time (Time C).
4. Wait for T3212 timer to expire (Time D).
5. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is out of coverage.
3. DUT is back in coverage.
4. Confirm T3212 timer expires at Time D. This should be X minutes after Time A.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives "Location Update Accept" from the network.
5. MT Voice Call / MT SMS is successful.

4.2.4 DUT out of coverage (back in coverage after T3212 expiry)

Description
The DUT immediately performs Periodic Location Area Update when it regains coverage when the T3212 timer has expired during out of coverage.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to out of coverage area. Note the time (Time B).
   Leave DUT out of coverage for a period greater than the T3212 timer value (greater than X minutes).
3. After a period greater than X minutes, bring DUT back into coverage. Note the time (Time C).
4. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is out of coverage.
3. DUT is back in coverage.
   DUT immediately sends a Location Update Request message to the network at Time C.
Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.

Confirm the DUT receives “Location Update Accept” from the network.

4. MT Voice Call / MT SMS is successful.

4.2.5 DUT Emergency Camping (back in coverage before T3212 expiry)

Description
The DUT shall not reset its T3212 timer when it is in Emergency Camping and regains coverage until the T3212 timer has expired.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).

T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to an area where it is Emergency Camping. Note the time (Time B).
   Leave DUT in Emergency Camping for ¾ of the T3212 timer value (¾ of X minutes).
3. After ¾ of X minutes, bring DUT back into coverage. Note the time (Time C).
4. Wait for T3212 timer to expire (Time D).
5. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is Emergency Camping.
3. DUT is back in coverage.
4. Confirm T3212 timer expires at Time D. This should be X minutes after Time A.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
5. MT Voice Call / MT SMS is successful.

4.2.6 DUT Emergency Camping (back in coverage after T3212 expiry)

Description
The DUT immediately performs Periodic Location Area Update when it regains coverage when the T3212 timer has expired during Emergency Camping.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.
Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to an area where it is Emergency Camping. Note the time (Time B).
   Leave DUT in Emergency Camping for a period greater than the T3212 timer value (greater
   than X minutes).
3. After a period greater than X minutes, bring DUT back into coverage. Note the time (Time C).
4. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is Emergency Camping.
3. DUT is back in coverage.
   DUT immediately sends a Location Update Request message to the network at Time C.
   Within the Location Update Request message, confirm the “Location Updating Type”
   parameter holds the “periodic updating” value.
   Confirm the DUT receives "Location Update Accept" from the network.
4. MT Voice Call / MT SMS is successful.

4.3 IMSI Attach

Description
The DUT shall successfully perform the IMSI attach procedures.

Related GSM core specifications
TS 24.008 sub clause 4.4.3

Reason for test
To verify that the DUT can successfully perform the IMSI attach procedures.

Initial configuration
Scenario A: DUT is powered off
Scenario B: Flight mode enabled.

Test procedure
Scenario A: Power ON
   1. Power on DUT.
   2. Receive MT call.

Scenario B: Flight Mode OFF
   1. Disable Flight Mode.
   2. Receive MT call.

Expected behaviour
1. DUT performs a Location Updating procedure using Location Updating Type = 2 (IMSI
   attach).
   The network shall respond to DUT with a LOCATION UPDATING ACCEPT that may contain
   a new TMSI.
If the LOCATION UPDATING ACCEPT contained a new TMSI, then verify that DUT acknowledges this message by sending a TMSI REALLOCATION COMPLETE. Otherwise, no TMSI REALLOCATION COMPLETE shall be sent.

DUT registers the new TMSI correctly

2. Voice Call is successful.

Note: The IMSI attach procedure is used only if the update status is UPDATED and if the stored Location Area Identification is the same as the one which is actually broadcasted on the BCCH of the current serving cell. If the UE indicates Location Updating Type = 0 (Normal location updating), power the UE off and on to verify that it then uses Location Updating Type = 2 (IMSI attach).

4.4 IMSI Detach

Description
The DUT shall successfully perform detach procedures.

Related GSM core specifications
TS 24.008 sub clause 4.3.4

Reason for test
To verify that the DUT can successfully perform detach procedures.

Initial configuration
DUT in idle mode

Test procedure

Scenario A: Power OFF
1. Power off DUT.
2. Receive MT call.

Scenario B: Flight Mode ON
1. Enable Flight Mode.
2. Receive MT call.

Expected behaviour
1. The UE performs the IMSI Detach procedure using the correct TMSI.
2. MT Call is unsuccessful.

5 Fax calls

5.1 GSM to/from fax modem (transparent only TS62)

NOTE: For fax calls, if the MS has a variety of auxiliary interfaces (e.g. serial, IR, Bluetooth) then a set of fax tests should be repeated for each of the interfaces supported.

5.1.1 MO fax calls to fax modem

Description
Call handling for MO fax calls to fax modems

Related GSM core specifications
TS 22.003
Reason for test
Ensure that MO fax calls to fax modems are properly handled.

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending faxes

Test procedure
For each of the following call configurations, make an outgoing fax call. Ensure that the call completes and the fax output is legible.

1. MO to class 1 fax modem, DTE hardware flow control, transmit rate 9600 bits/s
2. MO to Class 1 fax modem, DTE hardware flow control, transmit rate 9600 bits/s with ECM
3. MO to class 1 fax modem, DTE software flow control, transmit rate 9600 bits/s
4. MO to class 1 fax modem, DTE software flow control, transmit rate, 9600 bits/s with ECM
5. MO to class 2 fax modem, transmit rate, 9600 bits/s
6. MO to Class 2 fax modem, transmit rate, 9600 bits/s with ECM
7. Autobauding test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

5.1.2 MT fax calls from fax modem

Description
Call handling for MT fax calls from fax modems

Related GSM core specifications
TS 22.003

Reason for test
Ensure that MO fax calls from fax modems are properly handled.

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for receiving faxes

Test procedure
For each of the following call configurations, arrange to receive an incoming fax call. Ensure that the call completes and the fax output is legible.

1. MT from class 1 fax modem, DTE software flow control, transmit rate 9600 bits/s
2. MT from class 1 fax modem, DTE hardware flow control, transmit rate 9600 bits/s
3. MT from Class 1 fax modem, DTE hardware flow control, transmit rate 9600 bits/s with ECM
4. MT from Class 1 fax modem, DTE software flow control, transmit rate 9600 bits/s with ECM
5. MT from class 2 fax modem, transmit rate, 9600 bits/s
6. MT from class 2 fax modem, transmit rate, 9600 bits/s with ECM
7. Autobauding test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

5.1.3 MO fax calls to PSTN fax device

Description
Call handling for MO fax calls to PSTN fax devices
Related GSM core specifications
TS 22.003

Reason for test
Ensure that MO fax calls are properly handled to PSTN fax devices

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending faxes

Test procedure
For each of the following call configurations, make an outgoing fax call. Ensure that the call completes
and the fax output is legible.

- MO to Group 3 device, transmit rate 9600 bits/s with ECM
- MO to Group 3 device, transmit rate 9600 bits/s
- Down training test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

5.1.4 MT fax calls from PSTN fax device

Description
Call handling for MT fax calls from PSTN fax devices

Related GSM core specifications
TS 22.003

Reason for test
Ensure that Mt fax calls from PSTN fax devices are properly handled.

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for receiving faxes

Test procedure
For each of the following call configurations, arrange to receive an incoming fax call. Ensure that the
call completes and the fax output is legible.

- MT from Group 3 device, transmit rate 9600 bits/s
- MT from Group 3 device, transmit rate 9600 bits/s with ECM
- Down training test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

5.1.5 MO fax calls to GSM Mobile terminal

Description
Call handling for MO fax calls to GSM Mobile terminals

Related GSM core specifications
TS 22.003

Reason for test
Ensure that MO fax calls to GSM Mobile terminals are properly handled

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending faxes
Test procedure
For each of the following call configurations, make an outgoing fax call. Ensure that the call completes and the fax output is legible.

1. Class 1 fax terminal to Class 1 fax terminal, transmit rate 9600 bits/s
2. Class 1 fax terminal to Class 2 fax terminal, transmit rate 9600 bits/s
3. Class 2 fax terminal to Class 1 fax terminal, transmit rate 9600 bits/s
4. Autobauding test (negotiating down from 9600bps)
5. Class 2 fax terminal to Class 2 fax terminal, transmit rate 9600 bits/s

Expected behaviour
The call completes and the fax output is legible.

5.1.6 MT fax calls from GSM Mobile terminal
Description
Call handling for MT fax calls from GSM Mobile terminals
Related GSM core specifications
TS 22.003
Reason for test
Ensure that MT fax calls from GSM Mobile terminals are properly handled.
Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for receiving faxes
Test procedure
For each of the following call configurations, arrange to receive an incoming fax call. Ensure that the call completes and the fax output is legible.

1. Class 1 fax terminal to Class 1 fax terminal, transmit rate 9600 bits/s
2. Class 1 fax terminal to Class 2 fax terminal, transmit rate 9600 bits/s
3. Class 2 fax terminal to Class 1 fax terminal, transmit rate 9600 bits/s
4. Autobauding test (negotiating down from 9600bps)
5. Class 2 fax terminal to Class 2 fax terminal, transmit rate 9600 bits/s
6. Fax download from mailbox at 9600 bps

Expected behaviour
The call completes and the fax output is legible.

5.1.7 MO fax calls to ISDN fax device
Description
Call handling for MO fax calls to ISDN fax devices
Related GSM core specifications
TS 22.003
Reason for test
Ensure that MO fax calls are properly handled to ISDN fax devices
Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending faxes
Test procedure
For each of the following call configurations, make an outgoing fax call. Ensure that the call completes and the fax output is legible.

1. MO to Group 4 device, transmit rate 9600 bits/s with ECM
2. MO to Group 4 device, transmit rate, 9600 bits/s
3. Down training test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

5.1.8 MT fax calls from ISDN fax device

Description
Call handling for MT fax calls from ISDN fax devices

Related GSM core specifications
TS 22.003

Reason for test
Ensure that MT fax calls from ISDN fax devices are properly handled.

Initial configuration
MS in idle mode, connected to auxiliary equipment if necessary and configured for receiving faxes

Test procedure
For each of the following call configurations, arrange to receive an incoming fax call. Ensure that the call completes and the fax output is legible.

1. MT from Group 4 device, transmit rate 9600 bits/s
2. MT from Group 4 device, transmit rate 9600 bits/s with ECM
3. Down training test (negotiating down from 9600bps)

Expected behaviour
The call completes and the fax output is legible.

6 Data calls

NOTE 1: For data calls, if the MS has a variety of auxiliary interfaces (e.g. serial, IR, Bluetooth) then a set of data communication tests should be repeated for each of the interfaces supported.

NOTE 2: For UDI data calls, both V.110 and V.120 protocols should be tested.

6.1 9.6 kbit/s data calls

6.1.1 9.6 kbit/s MO data calls

Description
Call handling for MO 9.6 kbit/s data calls

Related GSM core specifications
TS 22.002

Reason for test
Ensure that MO 9.6 kbit/s data calls to a variety of destinations are properly handled
Initial configuration

MS in idle mode, connected to auxiliary equipment if necessary and configured for sending data.

Test procedure

For each of the following call configurations, make an outgoing MO data call. Ensure that the call completes and the data is exchanged correctly.

1. GSM non-transparent to GSM non-transparent UDI, 9600bits/s, circuit switched data
2. GSM non-transparent to GSM transparent UDI, 9600bits/s, circuit switched data
3. GSM to ISDN UDI, 9600bits/s, circuit switched data
4. GSM transparent to GSM non-transparent UDI, 9600bits/s, circuit switched data
5. GSM transparent to GSM transparent UDI (IWF by-pass), 9600bits/s, circuit switched data
6. MO to PSTN non-transparent, 9600bits/s, Autobauding, circuit switched data
7. MO to PSTN transparent, 9600bits/s, circuit switched data
8. GSM non-transparent to GSM non-transparent, 9600bits/s, Autobauding, circuit switched data
9. GSM non-transparent to GSM transparent, 9600bits/s, Autobauding, circuit switched data
10. GSM transparent to GSM non-transparent, 9600bits/s, Autobauding, circuit switched data
11. GSM transparent to GSM transparent, 9600bits/s, circuit switched data
12. V.42 Error Correction @9600bps in Transparent mode (MO Call to PSTN using VB-data/Analogue)
13. V.42 Error Correction @9600bps in Transparent mode (MO Call to PSTN using UDI)
14. V.42bis Data Compression @9600bps in Non-Transparent mode (MO call to PSTN using VB/Analogue connection)
15. V.42bis Data Compression @9600bps in Non-Transparent mode (MO call to PSTN using UDI connection)
16. V.42bis Data Compression @9600bps in Transparent mode (MO call to PSTN using VB/Analogue connection)
17. V.42bis Data Compression @9600bps in Transparent mode (MO call to PSTN using UDI connection)

Expected behaviour

The call completes and the data is exchanged correctly.

6.1.2 9.6 kbit/s MT data calls

Description

Call handling for MT 9.6 kbit/s data calls

Related GSM core specifications

TS 22.002

Reason for test

Ensure that MT 9.6 kbit/s data calls from a variety of sources are properly handled

Initial configuration

MS in idle mode, connected to auxiliary equipment if necessary and configured for receiving data

Test procedure

For each of the following call configurations, arrange to receive an incoming MT data call. Ensure that the call completes and the data is received correctly by the MS.

1. GSM non-transparent to GSM non-transparent UDI, 9600bits/s, circuit switched data
2. GSM non-transparent to GSM transparent UDI, 9600bits/s, circuit switched data
3. GSM to ISDN UDI, 9600bits/s, circuit switched data
4. GSM transparent to GSM non-transparent UDI, 9600bits/s, circuit switched data
5. GSM transparent to GSM transparent UDI (IWF by-pass), 9600bits/s, circuit switched data
6. MT from PSTN non-transparent, 9600bits/s, Autobauding, circuit switched data
7. MT from PSTN transparent, 9600bits/s, circuit switched data
8. GSM non-transparent to GSM non-transparent, 9600bits/s, Autobauding, circuit switched data
9. GSM non-transparent to GSM transparent, 9600bits/s, Autobauding, circuit switched data
10. GSM transparent to GSM non-transparent, 9600bits/s, Autobauding, circuit switched data
11. GSM transparent to GSM transparent, 9600bits/s, circuit switched data
12. V.42 Error Correction @9600bps in Transparent mode (MT Call from PSTN using VB-data/Analogue)
13. V.42 Error Correction @9600bps in Transparent mode (MT Call from PSTN using UDI)
14. V.42bis Data Compression @9600bps in Non-Transparent mode (MT call from PSTN using VB/Analogue connection)
15. V.42bis Data Compression @9600bps in Non-Transparent mode (MT call from PSTN using UDI connection)
16. V.42bis Data Compression @9600bps in Transparent mode (MT call from PSTN using VB/Analogue connection)
17. V.42bis Data Compression @9600bps in Transparent mode (MT call from PSTN using UDI connection)

**Expected behaviour**
The call completes and the data is exchanged correctly.

### 6.2 14.4 kbit/s and HSCSD data calls

#### 6.2.1 14.4 kbit/s and HSCSD MO data calls

**Description**
Call handling for MO 14.4 kbit/s and HSCSD data calls

**Related GSM core specifications**
TS 22.002

**Reason for test**
Ensure that MO 14.4 kbit/s and HSCSD data calls to a variety of destinations are properly handled

**Initial configuration**
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending data

**Test procedure**
For each of the following call configurations, make an outgoing MO data call. Ensure that the call completes and the data is received correctly by the distant party. For "X+Y" call configurations, the test should be repeated for each combination of uplink and downlink channel numbers supported by the MS.

1. MO to PSTN transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
2. MO to PSTN non-transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
3. MO to UDI transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
4. MO to UDI non-transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
5. GSM to GSM transparent UDI (IWF by-pass), X+Y TS, 9600 & 14400 bps channel codings, HSCSD
6. GSM to GSM non-transparent UDI (IWF by-pass), X+Y TS, 9600 & 14400 bps channel codings, HSCSD
7. HSCSD downgrading & upgrading from 1+1
8. ALA (change of channel coding during call)

**Expected behaviour**
The call completes and the data is exchanged correctly.

### 6.2.2 14.4 kbit/s and HSCSD MT data calls

**Description**
Call handling for MT 14.4 kbit/s and HSCSD data calls

**Related GSM core specifications**
TS 22.002

**Reason for test**
Ensure that MT 14.4 kbit/s and HSCSD data calls from a variety of sources are properly handled

**Initial configuration**
MS in idle mode, connected to auxiliary equipment if necessary and configured for sending data

**Test procedure**
For each of the following call configurations, make an outgoing MO data call. Ensure that the call completes and the data is received correctly by the distant party. For "X+Y" call configurations, the test should be repeated for each combination of uplink and downlink channel numbers supported by the MS.

1. MT from PSTN transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
2. MT from PSTN non-transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
3. MT from UDI transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
4. MT from UDI non-transparent, X+Y TS, 9600 & 14400 bps channel codings, HSCSD
5. GSM to GSM transparent UDI (IWF by-pass), X+Y TS, 9600 & 14400 bps channel codings, HSCSD
6. GSM to GSM non-transparent UDI (IWF by-pass), X+Y TS, 9600 & 14400 bps channel codings, HSCSD
7. HSCSD downgrading & upgrading from 1+1
8. ALA (change of channel coding during call)

**Expected behaviour**
The call completes and the data is exchanged correctly.

### 7 VOID

**NOTE:** This section formerly contained ‘SIM Management’. It is now combined with ‘UICC/USIM Aspects and SIM/USIM Interworking’ and moved to Annex D, section 57.
NOTE: This section formerly contained ‘SIM Application Toolkit’. It is now combined with ‘UICC/USIM Aspects and SIM/USIM Interworking’ and moved to Annex D, section 57.

9  GPRS / EGPRS

9.1  GPRS attach and detach / GPRS Service Indication

9.1.1  GPRS Attach

Description
The DUT shall successfully perform GPRS Attach under default network conditions.

Reason for test
To verify that the DUT can successfully perform the GPRS Attach procedure under default network conditions.

Related GSM core specifications
N.A.

Initial configuration
Automatic GPRS attach is enabled.

Scenario A: DUT is powered off
Scenario B: Flight mode enabled

Test procedure

Scenario A: Power ON
1. Power on the DUT.
2. Check GPRS service indication.

Scenario B: Flight Mode OFF
1. Disable Flight Mode.
2. Check GPRS service indication.

Expected behaviour
1. DUT performs GPRS attach procedure within a few seconds after the IMSI attach.
   DUT sends an ATTACH REQUEST to the network.
   The network shall respond to the DUT with an ATTACH ACCEPT that may contain a new P-TMSI.
   If the ATTACH ACCEPT contained a new P-TMSI, then verify that the DUT acknowledges this message by sending an ATTACH COMPLETE. Otherwise, no ATTACH COMPLETE shall be sent.
   The DUT registers the new P-TMSI correctly.
2. DUT displays an Icon to indicate it is GPRS attached. [Operating System dependent]

9.1.2  GPRS Detach

Description
The DUT shall successfully perform GPRS detach procedures under default network conditions.
Related GSM core specifications
GSM 04.08, section 4.3.4.

Reason for test
To verify that the DUT can successfully perform the GPRS Detach procedure under default network conditions.

Initial configuration
DUT is in Idle mode and GPRS Attached.

Test procedure
Scenario A: Power OFF
Power off DUT.

Scenario B: Flight Mode ON
Enable Flight Mode.

Expected behaviour
DUT sends a DETACH REQUEST indicating Detach type = “power switched off, GPRS detach” using the correct P-TMSI.

The network shall not acknowledge this message.

9.1.3 Service indication (cell reselection)

Description
To verify the operation of the GPRS service icon when DUT is GPRS attached/detached and in an area where no GPRS service is available.

Reason for test
To identify the operation of the GPRS service icon when DUT is GPRS attached/detached and in an area where no GPRS service is available.

Related GSM core specifications
n/a

Initial configuration
DUT is in Idle mode and GPRS Attached and camping on a cell supporting GPRS.

Test procedure
1. Move DUT to an area not supporting GPRS
2. Move DUT to an area supporting GPRS.
3. Move DUT to an area not supporting GPRS
4. Move DUT to an area supporting GPRS.

Expected behaviour
1. DUT stops displaying GPRS Service when in an area of no GPRS
2. DUT displays GPRS service when in an area with GPRS.
3. DUT stops displaying GPRS Service when in an area of no GPRS
4. DUT displays GPRS service when in an area with GPRS.
9.1.4  GPRS attach with IMSI / with P-TMSI / with or without authentication procedure

Description
Verify, that the DUT performs correctly the operation of GPRS attach with IMSI / with P-TMSI / with or without authentication procedure.

Reason for test
Ensure that the DUT performs correctly the operation of GPRS attach.

Related GSM core specifications
GSM 04.08 section 4.7.3.1.

Initial configuration
Initially the DUT must be in power off (if automatic attach is implemented) or in idle state (if manual attach is implemented). The DUT does not have a valid P-TMSI.

The network shall be configured to include the IMSI and P-TMSI signature in the ATTACH procedure. Ciphering is not enabled.

Test procedure
1. GPRS attach with IMSI. Attach Request message from DUT to SGSN includes Random TLLI on BSSGP layer.
2. ATTACH is successful and DUT is identified by IMSI on GMM layer. The SGSN includes the P-TIMSI and the P-TIMSI signature in the ATTACH ACCEPT message. Take note of the P-TIMSI.
   The DUT stores the P-TIMSI and the signature in the SIM.
3. Perform normal GPRS Detach and power off the MS.
4. GPRS attach with P-TMSI (make sure that the P-TMSI passing through the Gb interface is the same as the one noted in step 2)
   The test shall be performed in NMO I (to verify all the combined procedure) and NMO II, with and without Authentication and Ciphering.

Expected behaviour
The DUT performs correctly the operation of GPRS attach with IMSI / with P-TMSI / with or without authentication procedure.

9.1.5  GPRS roaming allowed

Description
Verify, that the DUT handles correctly the roaming procedure.

Reason for test
Ensure that the DUT handles correctly the roaming procedure.

Related GSM core specifications
GSM 04.08

Initial configurations
DUT is switched off.
DUT is outside its HPLMN (camping on a VPLMN)
SIM is configured to allow GPRS roaming.

Test procedure
Power on DUT.

Expected behaviour
DUT performs successful GPRS attach procedure
DUT displays an icon to indicate it is GPRS attached. [Operating System dependent]
DUT indicates by means of an icon that it is Roaming outside its HPLMN.

9.1.6 GPRS Attach/PLMN not allowed (Reject Cause #11)

Description
Verify, that the DUT behaves correctly when the PLMN rejects the GPRS attach procedure with the cause IMSI Unknown in HLR.

Reason for test
To confirm that the DUT behaves correctly when the PLMN rejects the GPRS attach procedure with the cause IMSI Unknown in HLR.

Related GSM core specifications
GSM 04.08 section 4.7.3.1

Initial configuration
Initially the DUT must be in power off (if automatic attach is implemented) or in idle state (if manual attach is implemented). A SIM is available which does not have a valid IMSI.

Test procedure
1. Activate the DUT and perform a GPRS attach.
2. Note the display and error message displayed.
3. Power cycle the DUT.

Expected behaviour
1. The DUT shall attempt to GPRS attach
2. The DUT shall display an appropriate error message
3. The DUT shall attempt to GPRS attach

9.1.7 GSM roaming allowed/GPRS roaming not allowed in this PLMN (Reject cause #14)

Description
Verify, that the DUT handles correctly the reject cause #14 (GPRS Roaming not allowed in this PLMN).

Reason for test
Ensure that the DUT handles correctly the reject cause #14 (GPRS Roaming not allowed in this PLMN).

Related GSM core specifications
GSM 04.08, section 4.7.3

Initial configurations
Initially the DUT must be in power off (if automatic attach is implemented) or in idle state (if manual attach is implemented). A SIM is available which has a valid IMSI in the roaming network.

GSM Roaming is enabled in the visited PLMN. GPRS roaming is not enabled.

Test procedure
1. The DUT is powered on in the HOME PLMN and performs IMSI attach (GSM attach successful) and GPRS attach (GPRS attach successful).
2. The DUT is moved to the VISITED PLMN and shall attempt to register to the VISITED SGSN (GPRS attach does not succeed).
3. The DUT is moved back to the HOME PLMN and shall attempt the GPRS attach (GPRS attach successful).
Expected behaviour
The DUT is performing the GPRS Attach procedure accordingly and shall not attempt to perform a second GPRS Attach or a PDP Context Activation in the VISITED PLMN. Back in the HOME PLMN the DUT shall offer full GPRS functionality.

9.1.8 GSM roaming allowed/GPRS Service not allowed (Reject cause #7)

Note: Some networks do not use reject cause #7 anymore and use #14 instead.

Description
Verify that the DUT handles correctly the reject cause #7 (GPRS Roaming not allowed).

Reason for test
Ensure that the DUT handles correctly the reject cause #7 (GPRS Roaming not allowed).

Related GSM core specifications
GSM 04.08, section 4.7.3

Initial configurations
Initially the DUT must be in power off (if automatic attach is implemented) or in idle state (if manual attach is implemented). A SIM is available which has a valid IMSI in the roaming network.

GSM Roaming is enabled in the visited PLMN. GPRS service is not enabled in the visited PLMN.

Test procedure
1. The DUT is powered on in the HOME PLMN and performs IMSI attach (GSM attach successful) and GPRS attach (GPRS attach successful).
2. The DUT is moved to the VISITED PLMN and shall attempt to register to the VISITED SGSN (GPRS attach does not succeed).
3. The DUT is moved back to the HOME PLMN and shall not attempt the GPRS attach.
4. The DUT is powered off then on. The DUT shall perform GSM and GPRS attach successfully.

Expected behaviour
The DUT is performing the GPRS Attach procedure accordingly and shall not attempt to perform a second GPRS Attach or a PDP Context Activation in the VISITED PLMN. Back in the HOME PLMN the DUT shall offer full GPRS functionality.

9.1.9 Verification of GPRS Ciphering Algorithm Used

Description
This test verifies that the strongest GPRS ciphering algorithm is used that is supported by the DUT and the network.

Reason for test
Several ciphering algorithms are supported by mobile stations and networks today. This test verifies that the DUT sends information about all supported ciphering algorithms to the network so the network can select the strongest algorithm it supports.

Related GSM core specifications
3GPP TS 24.008

Initial configuration
Initially the DUT must not be attached to the GPRS network.

A logging tool is required to verify which encryption algorithm is activated.

Test procedure
1. Perform a GPRS attach
2. Monitor which ciphering algorithms the DUT indicates as supported during the GPRS attach procedure
3. Perform a PDP context activation
4. Monitor which ciphering the network activates

Expected behaviour
The DUT includes information about all ciphering algorithms it supports in the communication with the network. Typically this is GEA1, GEA2 and GEA3 today. Verify that the network then uses the strongest ciphering algorithm it supports.

9.2 Combined Attach and Detach

9.2.1 Combined Attach

Description
The DUT shall successfully perform the combined attach procedures.

Related GSM core specifications
N.A.

Reason for test
To verify that the DUT can successfully perform the combined attach procedures.

Initial configuration
Automatic GPRS attach is enabled.
Scenario A: DUT is powered off
Scenario B: Flight mode enabled.

Test procedure

Scenario A: Power ON
1. Power on DUT.
2. Check GPRS service indication.
3. Receive MT Call.

Scenario B: Flight Mode OFF
1. Disable Flight Mode.
2. Check GPRS service indication.
3. Receive MT Call.

Expected behaviour
1. DUT sends a combined ATTACH REQUEST to the network.
   ATTACH REQUEST message, the “Attach type” parameter holds the “Combined GPRS / IMSI attach” value.
   ATTACH ACCEPT message, the “Attach result” parameter holds the “Combined GPRS / IMSI attached” value.
   If the ATTACH ACCEPT contained a new “TMSI/P-TMSI” value, then verify that the DUT acknowledges this message by sending an ATTACH COMPLETE. Otherwise, no ATTACH COMPLETE shall be sent.
2. DUT displays an Icon to indicate it is GPRS attached. [Operating System dependent]
3. Voice call is successful
9.2.2 Combined Detach

Description
The DUT shall successfully perform the combined detach procedures.

Related GSM core specifications
GSM 04.08, section 4.3.4.

Reason for test
To verify that the DUT can successfully perform the combined detach procedures.

Initial configuration
DUT is in Idle mode and GPRS Attached.

Test procedure
Scenario A: Power OFF
1. Power off DUT.
2. Receive MT Call.

Scenario B: Flight Mode ON
1. Enable Flight Mode.
2. Receive MT Call.

Expected behaviour
1. DUT sends a DETACH REQUEST message, the “Detach type” parameter holds the “power switched off, combined GPRS / IMSI detach” value. If the detach is not done at power off, the “Detach type” parameter will hold the “normal, combined GPRS / IMSI detach” value and the network will answer back to the DETACH REQUEST with a DETACH ACCEPT message.
2. MT call is unsuccessful.

9.3 Access Point Name (APN)

9.3.1 Manual APN set by MMI

Description
This test verifies the possibility to set manually the APN in the DUT via the MMI.

Reason for test
To test the possibility to set manually the APN in the DUT via the MMI.

Related GSM core specifications
n/a

Initial configuration
The DUT must be powered on.

Test procedure
Verify if it is possible to configure manually the APN settings in the DUT via the MMI, especially for WAP applications.
Expected behaviour
The APN can be set manually in the DUT via the MMI.

9.3.2 Manual APN set by Software Command

Description
To verify the possibility to set the APN via software with AT commands (and verify that the phone accepts the correct syntax.

Reason for test
To test the possibility to set the APN via software with AT commands (and verify that the phone accepts the correct syntax.

Related GSM core specifications
GSM 07.07, section 10.1.1

Initial configuration
The DUT must be in power on and connected to a PC with a cable (RS232 or USB) or other supported interface (such as IrDA). The APN is cleared.

Test procedure
Configure the GPRS APN with AT command (AT+CGDCONT).

Expected behaviour
The correct APN is stored in the DUT

9.4 PDP Context

9.4.1 PDP context activation

9.4.1.1 User initiated PDP context activation

Description
The DUT shall perform PDP context activation successfully

Reason for test
Verify that the DUT performs correctly the PDP context activation.

Related GSM core specifications
GSM 04.08, section 6.1.3.1

Initial configuration
DUT is in Idle mode and GPRS Attached.

Test procedure

Scenario A: Browsing Application
1. Activate a PDP context via the embedded Browsing application. If the DUT establishes a PDP context automatically after power-on or after leaving flight mode, this behaviour is acceptable as part of this test case as well.
2. Load a page on the Internal browser.

Scenario B: Modem Application
1. Connect DUT to a PC. Activate a PDP context by setting up a Tethering/PCDial up connection.
2. Load a page on the PC browser or Ping a known reachable IP address.

Expected behaviour
1. The DUT performs PDP context activation.
The DUT indicates the PDP context activation by means of an Icon or similar.

2. The page is loaded successfully.

9.4.1.2 User initiated PDP context activation, rejected by the network with cause unknown APN

Description
Verify DUT informs the user of the PDP context reject.

Related 3GPP core specifications
3GPP TS 24.008

Reason for test
To ensure that the DUT is not able to activate a PDP context with unknown APN and informs the user the reason why it was rejected.

Initial configuration
DUT is in Idle mode and GPRS Attached.

Test procedure
Scenario A: Browsing Application
1. Define an incorrect APN for the browser application.
2. Try to activate a PDP context via the embedded Browsing application. If the DUT establishes a PDP context automatically after power-on or after leaving flight mode, this behaviour is acceptable as part of this test case as well.
3. Load a page on the Internal browser.

Scenario B: Modem Application
1. Connect DUT to a PC. Define an incorrect APN for the Tethering/PCDial up connection.
2. Try to activate a PDP context by setting up a Tethering/PCDial up connection.
3. Load a page on the PC browser or Ping a known reachable IP address.

Expected behaviour
1. Incorrect APN setting stored.
2. The DUT attempts PDP context activation but receives an “ACTIVATE PDP CONTEXT REJECT” with cause “Unknown APN” from the network.
3. The page cannot be loaded.

9.4.2 PDP Context deactivation

9.4.2.1 User initiated PDP context deactivation

Description
The DUT shall perform PDP context deactivation successfully

Reason for test
Verify that the DUT performs correctly the PDP context deactivation.

Related GSM core specifications
GSM 04.08, section 6.1.3.3.1

Initial configuration
DUT has an successful PDP context activated according to test procedure 9.4.1.1 “User initiated PDP context activation”.

Version 11.4
Test procedure

Scenario A: Browsing Application
1. Close the embedded Browsing application. If the PDP context is maintained per default even when all applications are closed, disable the use of data services in the settings menu of the DUT. This behaviour is acceptable as part of this test case as well.
2. 

Scenario B: Modem Application
1. Disconnect the Tethering/PC Dialup connection.
2. Load a page on the PC browser or Ping a known reachable IP address.

Expected behaviour
1. The PDP context is deactivated.
   DUT no longer displays an Icon to indicate PDP context is active.
2. The page cannot be loaded.

9.4.2.2 No PDP context deactivation without user action

Description
Verify that the DUT doesn’t deactivate the PDP context by itself (without user action).

Reason for test
Ensure that the DUT doesn’t deactivate the PDP context by itself (without user action).

Related GSM core specifications
GSM 04.08, section 6.1.3.3.3

Initial configuration
DUT has an successful PDP context activated according to test procedure 9.4.1.1 “User initiated PDP context activation”.

Test procedure

Scenario A: Browsing Application
1. Load a page on the Internal browser.
2. Wait for at least 20 minutes.

Scenario B: Modem Application
1. Load a page on the PC browser or Ping a known reachable IP address.
2. Wait for at least 20 minutes.

Expected behaviour
1. Page is loaded successfully.
2. The DUT doesn’t deactivate the PDP context by itself.

9.4.2.3 Network imitated PDP context deactivation

Description
To verify that the DUT performs correctly the PDP context deactivation when it receives the appropriate network command.

Reason for test
Ensure that the DUT performs correctly the PDP context deactivation when it receives the appropriate network command.
Related GSM core specifications
GSM 04.08, section 6.1.3.3.2

Initial configuration
DUT has a successful PDP context activated according to test procedure 9.4.1.1 “User initiated PDP context activation”.

Test procedure
Scenario A: Browsing Application
1. Load a page on the Internal browser.
2. Network sends PDP context deactivation request to DUT.

Scenario B: Modem Application
1. Load a page on the PC browser or Ping a known reachable IP address.
2. Network sends PDP context deactivation request to DUT.

Expected behaviour
1. Page is loaded successfully.
2. The PDP context is deactivated.
   DUT no longer displays an Icon to indicate PDP context is active.

9.4.3 Simultaneous PDP context

9.4.3.1 User initiated Simultaneous Primary PDP context activation

Description
Verify that the DUT performs correctly the PDP context activation for browser applications and modem applications simultaneously.

Reason for test
Ensure that the DUT performs correctly the PDP context activation for browser applications and modem applications simultaneously.

Related GSM core specifications
GSM 04.08, section 6.1.3.1

Initial configuration
DUT is in Idle mode and GPRS Attached.
2 different APNs of the same network are available.

Test procedure
1. Configure the Browsing application to use APN 1.
2. Activate a PDP via the embedded Browsing application. If the DUT establishes a PDP context automatically after power-on or after leaving flight mode, this behaviour is acceptable as part of this test case as well.
3. Load a page on the Internal browser.
4. Connect DUT to a PC. Configure the Tethering/PCDial Up connection to use APN 2.
5. Activate a PDP by setting up a Tethering/PCDial up connection.
6. Load a page on the PC browser or Ping a known reachable IP address.

Expected behaviour
1. APN settings for Browsing application configured correctly.
2. The DUT performs PDP context activation.
The DUT indicates the PDP context activation by means of an Icon or similar.

3. The page is loaded successfully.

4. APN settings for Tethering/PC Dial Up connection configured correctly.

5. The DUT performs a second PDP context activation.
   The DUT indicates the active PDP contexts by means of an Icon or similar.

6. The page is loaded successfully.

9.4.3.2 User initiated Simultaneous PDP context deactivation

Description
Verify that the DUT performs correctly the PDP context activation for browser applications and modem applications simultaneously.

Reason for test
Ensure that the DUT performs correctly the PDP context activation for browser applications and modem applications simultaneously.

Related GSM core specifications
GSM 04.08, section 6.1.3.1

Initial configuration
DUT has an successful PDP contexts activated according to test procedure 9.4.3.1 “User initiated Simultaneous Primary PDP context activation”.

Test procedure
1. Disconnect the Tethering/PC Dialup connection.
2. Load a page on the Internal browser.

Expected behaviour
1. The PDP context is deactivated for the Tethering/PC Dialup connection.
   The PDP context for the internal Browser is still active.
2. The page is loaded successfully.

9.4.4 User initiated PDP context modification

Description
Verify the behaviour of the DUT upon receipt of a “modify PDP context request” message.

Reason for test
Test the behaviour of the DUT upon receipt of a “modify PDP context request” message.

Related GSM core specifications
GSM 04.08, section 6.1.3.2

Initial configuration
The DUT must be in ready or standby state, with the PDP context activated.

Test procedure
The user must activate a PDP context. A “modify PDP context request” message is then sent to the DUT from the SGSN (the trigger of this message depends on the network implementation) with a QoS that is acceptable to the MS.

Expected behaviour
The DUT shall send a “modify PDP context accept” message in return. If the QoS are not acceptable from the MS, it shall send a “deactivate PDP context request” message in return.
9.5 Coding schemes

9.5.1 Support of CS1, CS2, CS3, CS4 coding scheme

Description
Test if the DUT supports the four coding schemes. Verify also if the DUT can switch between different Coding Schemes during download.

Reason for test
Ensure that the DUT supports the four coding schemes. Verify also if the DUT can switch between different Coding Schemes during download.

Related GSM core specifications
GSM 03.64

Initial configuration
The DUT must be power on.

Test procedure
Create the condition such the PCU will use different coding scheme. This operation is network dependent (either forcing the usage of one specific CS or through automatically link adaptation).

Verify the following cases:
1. The terminal support CS1 coding scheme
2. The terminal support CS2 coding scheme
3. The terminal support CS3 coding scheme
4. The terminal support CS4 coding scheme

Expected behaviour
The DUT supports the four coding schemes. The DUT switches between different CS during download.

9.6 Multislot Allocation

9.6.1 PSET Down-/Upgrade

Description
To verify that the DUT can operate correctly when the GPRS resource is downgraded from 4 to 3 to 2 to 1 to 0 timeslots using CS traffic and TCH Blocking. Multiplexing and adding new GPRS traffic and CS traffic. Verify that the DUT can operate using consecutive and non-consecutive timeslots and that the SUSPEND and RESUME commands operate correctly.

Reason for test
To ensure that the DUT can operate correctly when the GPRS resource is downgraded from 4 to 3 to 2 to 1 to 0 timeslots using CS traffic and TCH Blocking. Multiplexing and adding new GPRS traffic and CS traffic. Ensure that the DUT can operate using consecutive and non-consecutive timeslots and that the SUSPEND and RESUME commands operate correctly.

Related GSM core specifications
GSM 03.64

Initial configuration
The DUT is GPRS and IMSI attached. A PDP Context is active.

Test procedure
1. Set-up an FTP or similar so that all available PDCHs are being utilised by the MS.
2. Check that the GPRS resource is downgraded from 4 to 3 to 2 to 1 to 0 timeslots using CS traffic and TCH Blocking. Multiplexing and adding new GPRS traffic and CS traffic. Ensure that the DUT can operate using consecutive and non-consecutive timeslots and that the SUSPEND and RESUME commands operate correctly.

**Expected behaviour**
The DUT is correctly up- and downgrading when the GPRS resource is changed and the Data Transmission is maintained.

### 9.7 Cell selection and reselection

#### 9.7.1 Periodic Location Update (PLU) during GPRS operations

**Description**
Verify that the DUT performs a PLU upon T3212 expiry even if the Class B DUT is performing FTP for example.

**Reason for test**
To ensure that the DUT performs a PLU upon T3212 expiry even if the Class B DUT is performing FTP for example.

**Related GSM core specifications**
GSM 04.08, section 4.4.2

**Initial configuration**
DUT is in Idle mode and GPRS Attached.

**Test procedure**
1. Activate a PDP context by setting up a Tethering/PCDial up connection.
2. Download a large non-compressible file.
3. Wait for the T3212 timer to expire.
5. Monitor the data transfer.

**Expected behaviour**
1. PDP context is activated.
2. File is downloading.
3. A successful Periodic Location Update procedure is performed.
4. MT call is successful
5. Data transfer resumes.

#### 9.7.2 Periodic Routing Area Update (PRAU)

**Description**
To verify that the DUT does not perform a PRAU before expiry of MobileReachableTimer. Verify that the DUT does perform a PRAU upon expiry of MobileReachableTimer + the READY timer value. To check that the PRAU timer is independent of the PLU timer T3212.

**Reason for test**
To ensure that the DUT does not perform a PRAU before expiry of MobileReachableTimer. Ensure that the DUT does perform a PRAU upon expiry of MobileReachableTimer + the READY timer value. Ensure that the PRAU timer is independent of the PLU timer T3212.

**Related GSM core specifications**
GSM 04.08 sections 4.7.2.2 and 4.7.5
Initial configuration
DUT is in Idle mode and GPRS Attached.

Test procedure
1. Wait for the T3312 timer to expire.
2. Check GPRS service indication.
3. Activate a PDP context via the embedded Browsing application. If the DUT already established a PDP context automatically after power-on this behaviour is acceptable as part of this test case as well.
4. Load a page on the Internal browser.

Expected behaviour
1. Observe if the DUT sends the network a ROUTING AREA UPDATE REQUEST message.
   Check whether the “update type” parameter holds the “periodic updating” (3) value.
   The network shall then send a ROUTING AREA UPDATE ACCEPT message to the DUT.
   If the ROUTING AREA UPDATE ACCEPT contained a new P-TMSI, then verify that the DUT acknowledges this message by sending an ROUTING AREA UPDATE COMPLETE. Otherwise, no ROUTING AREA UPDATE COMPLETE shall be sent.
2. DUT displays an Icon to indicate it is GPRS attached. [Operating System dependent]
3. The DUT performs PDP context activation.
4. The page is loaded successfully.

9.8 Stationary Data Performance

9.8.1 Stationary Downlink Throughput

Description
Verify the downlink data throughput of GPRS / EGPRS implementation in live networks.

Reason for test
To ensure that the downlink GPRS and downlink EGPRS data throughput of the DUT is acceptable in stationary condition

Related GSM core specifications
N/A

Initial configuration
Client 1 is used as a reference device.
Client 1 is used in parallel with DUT to rule out any network discrepancies.
Client 1 is has same Multislot class as DUT.
DUT and Client 1 are IMSI and GPRS attached in the same PLMN.
DUT and Client 1 are connected to a laptop.

Test procedure
Scenario A: GPRS
1. Activate PDP Context on DUT and Client 1 by means of Tethering or DUN.
2. Download a large non-compressible file and record the average throughput.
3. Repeat the download for up to 5 attempts.

Scenario B: EGPRS
1. Activate PDP Context on DUT and Client 1 by means of Tethering or DUN.
2. Download a large non-compressible file and record the average throughput.
3. Repeat the download for up to 5 attempts.

**Expected behaviour**
1. PDP context is established on DUT and Client 1.
2. DUT and Client 1 complete the download and the throughput is recorded.
3. After 5 attempts, the average throughput result on DUT and Client 1 shall be comparable (for example within 10%).

### 9.8.2 Stationary Downlink Data Transfer Stability

**Description**
Verify the stability of DUT during downlink data transfer.

**Reason for test**
To ensure that the GPRS stack and IP layer implementation is stable for large file download

**Related GSM core specifications**
N/A

**Initial configuration**
DUT is IMSI and GPRS attached.
DUT is connected to a laptop.
Identify the area where signal strength is medium (-70dBm to -90dBm)

**Test procedure**

**Scenario A: GPRS**
1. Activate PDP Context on DUT by means of Tethering or DUN.
2. Download a large non-compressible file of 15 Mb.
3. When the download completes, open the internal browser and load a page.
4. Repeat steps 1-3 for up to 3 attempts.

**Scenario B: EGPRS**
1. Activate PDP Context on DUT by means of Tethering or DUN.
2. Download a large non-compressible file of 15 Mb.
3. When the download completes, open the internal browser and load a page.
4. Repeat steps 1-3 for up to 3 attempts

**Expected behaviour**
1. PDP context is established on DUT.
2. The file download completes successfully.
3. The page loads successfully.
4. The DUT is stable throughout the attempts.

### 9.8.3 Stationary Uplink Throughput

**Description**
Verify the uplink data throughput of GPRS / EGPRS implementation in live networks.
Reason for test
To ensure that the uplink GPRS and uplink EGPRS data throughput of the DUT is acceptable in stationary condition

Related GSM core specifications
N/A

Initial configuration
Client 1 is used as a reference device.
Client 1 is used in parallel with DUT to rule out any network discrepancies.
Client 1 is has same Multislot class as DUT.
DUT and Client 1 are IMSI and GPRS attached in the same PLMN.
DUT and Client 1 are connected to a laptop.

Test procedure
Scenario A: GPRS
1. Activate PDP Context on DUT and Client 1 by means of Tethering or DUN.
2. Upload a large non-compressible file and record the average throughput.
3. Repeat the upload for up to 5 attempts.

Scenario B: EGPRS
1. Activate PDP Context on DUT and Client 1 by means of Tethering or DUN.
2. Upload a large non-compressible file and record the average throughput.
3. Repeat the upload for up to 5 attempts.

Expected behaviour
1. PDP context is established on DUT and Client 1.
2. DUT and Client 1 complete the upload and the throughput is recorded.
3. After 5 attempts, the average throughput result on DUT and Client 1 shall be comparable (for example within 10%).

9.8.4 Stationary Uplink Data Transfer Stability

Description
Verify the stability of DUT during uplink data transfer.

Reason for test
To ensure that the GPRS stack and IP layer implementation is stable for large file upload

Related GSM core specifications
N/A

Initial configuration
DUT is IMSI and GPRS attached.
DUT is connected to a laptop.
Identify the area where signal strength is medium (-70dBm to -90dBm)

Test procedure
Scenario A: GPRS
1. Activate PDP Context on DUT by means of Tethering or DUN.
2. Upload a large non-compressible file of 15 Mb.
3. When the upload completes, open the internal browser and load a page.
4. Repeat steps 1-3 for up to 3 attempts.

**Scenario B: EGPRS**

1. Activate PDP Context on DUT by means of Tethering or DUN.
2. Upload a large non-compressible file of 15 Mb.
3. When the upload completes, open the internal browser and load a page.
4. Repeat steps 1-3 for up to 3 attempts

**Expected behaviour**

1. PDP context is established on DUT.
2. The file upload completes successfully.
3. The page loads successfully.
4. The DUT is stable throughout the attempts.

### 9.9 Interactions with GSM

**Description**

Verify the GSM services while DUT is in GMM STANDBY/READY states.

**Reason for test**

To ensure that GSM services are not impacted by packet data activities.

**Related 3GPP core specifications**

TS 23.060

**Initial configuration**

DUT is IMSI and GPRS attached.

DUT is connected to a laptop.

For Scenario B and Scenario C, If DUT does not have tethering functionality another means to execute the test case is to use an internal application to generate GPRS traffic such as the web browser. If the DUT has a multitasking operating system, all parts of this test case can be executed. If the DUT is only single tasking and hence the web browser can't be closed with the GPRS session being closed as well, at least the mobile terminated tests shall be executed and a comment shall be made in the test case result documentation.

**Test procedure**

**Scenario A: GPRS Attached**

1. DUT is in IDLE mode (GMM STANDBY state).
4. Send MO SMS to Client 1.
5. Receive MT SMS from Client 1.

**Scenario B: PDP context (no data transfer) (see initial configuration)**

1. Activate PDP context and block data. Wait until DUT is in GMM STANDBY state.
4. Send MO SMS to Client 1.
5. Receive MT SMS from Client 1.
Scenario C: PDP context (with data transfer) (see initial configuration)

1. Activate PDP context and download a large non-compressible file during GMM Ready state.
4. Send MO SMS to Client 1.
5. Receive MT SMS from Client 1.

Expected behaviour

1. DUT is in state according to desired scenario (A/B/C).
2. Voice call is successful. During Scenario C, the DUT should suspend data transfer when the voice call is active and resume data transfer once the voice call is ended.
3. Voice call is successful. During Scenario C, it is possible that MT voice calls may not be received during an active data transfer unless the network operates in NMO I or uses some form of paging coordination. This shall be known before the test so the tester can verify the according behaviour.
4. SMS is sent successfully.
5. SMS is received successfully. During Scenario C, it is possible that MT SMS may not be received during an active data transfer unless the network operates in NMO I or uses some form of paging coordination. This shall be known before the test so the tester can verify the according behaviour.

9.10 Link Adaptation and Incremental Redundancy

Description
Verify link adaptation and incremental redundancy.

Reason for test
To ensure that the correct implementation of LA and IR on the ME.

Initial configuration
The DUT is GPRS attached and IMSI attached.
Use the DUT in tethered mode as a modem for laptop
Identify a route with C/I and RSSI various significantly
If available one of the test routes should contain some cells which are GPRS-only.

Test procedure

1. Activate PDP Context
2. Start FTP download of a large file.
3. Drive on the identified route and take MS/network traces
4. Start file upload and repeat step 3.

Expected behaviour

1. The file upload and download shall completed when there is no loss of coverage
2. Verify the DUT adapts its modulation and coding schemes when RF condition varies
3. Verify the MCS family used.

10 VOID

NOTE: This section formerly contained Test Cases for ‘EGPRS’. It is now combined with section ‘GPRS / EGPRS’ and moved to section 9.
11 A5/3 Ciphering Scenarios

11.1 Stationary A5/3 Tests

11.1.1 Location Updating with A5/3 Ciphering

Description
Location Updating with A5/3 ciphering is performed.

Reason for test
To ensure ciphering with A5/3 algorithm during location updating.

Related GSM core specifications
3GPP TS 04.18, 44.018, 24.008, 55.216

Initial configuration
The test is performed in a 2G network which supports cipher algorithm A5/3 on both BSS and MSC.
For NMO I networks, ensure the DUT is set to CS only attach (no auto attach).
Change the TMSI and LAI on the (U)SIM to a different but valid figure. (For some networks, ciphering will only occur when a TMSI reallocation process takes place during the Location updating procedure).
DUT is powered off.

Test procedure
1. Power on DUT.
2. Receive MT call.

Expected behaviour
1. Verify that the DUT sends “A5/3 available” within MOBILE STATION CLASSMARK section of the CLASSMARK CHANGE message to the Network.
   Verify that the device receives “cipher with algorithm A5/3” within CIPHER MODE SETTING section of the CIPHERING MODE COMMAND message from the network.
   The network shall respond to DUT with a LOCATION UPDATING ACCEPT message that contains a new TMSI.
2. Voice Call is successful.

11.1.2 VOID
This Test Case has been deleted.

11.1.3 Mobile Originated Speech Call with A5/3 Ciphering

Description
A mobile originated voice call is established using A5/3 ciphering.

Reason for test
To ensure ciphering with A5/3 algorithm is possible when this is supported in the network.

Related GSM core specifications
3GPP TS 04.18, 44.018, 24.008, 55.216

Initial configuration
The 2G network used for this test supports cipher algorithm A5/3 on both BSS and MSC. A second device (PSTN or mobile phone) is required.
Test procedure

1. Initiate a mobile originated speech call from the DUT to any phone (PSTN or mobile phone).
2. Verify that the DUT sends “A5/3 available” within MOBILE STATION CLASSMARK 2 in CM SERVICE REQUEST to the Network.
3. Verify that the DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in CIPHER MODE COMMAND from the network.
4. The B-party accepts the call.
5. The call is active for at least one minute. Release the call.

Expected behaviour

1. A mobile originated speech call can be set up
2. The device sends “A5/3 available.”
3. Cipher mode setting is set to “cipher with algorithm A5/3”
4. The end to end voice connection could be setup
5. The call is active and can be successfully released

11.1.4 Mobile Terminated Speech Call with A5/3 Ciphering

Description
A mobile terminated voice call is established using A5/3 ciphering.

Reason for test
To ensure ciphering with A5/3 algorithm is possible when this is supported in the network.

Related GSM core specifications
3GPP TS 04.18, 44.018, 24.008, 55.216.

Initial configuration
The 2G network used for this test supports cipher algorithm A5/3 on both BSS and MSC. A second device (PSTN or mobile phone) is required.

Test procedure

1. Perform a mobile terminated speech call to the DUT from any phone (PSTN or mobile phone).
2. Verify that the DUT sends “A5/3 available” within MOBILE STATION CLASSMARK 2 in CM SERVICE REQUEST to the Network.
3. Verify that the DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in CIPHER MODE COMMAND from the network.
4. The B-party accepts the call. Check the end to end voice connection.
5. Release the call.

Expected behaviour

1. A mobile originated speech call can be set up
2. The device sends “A5/3 available.”
3. Cipher mode setting is set to “cipher with algorithm A5/3”
4. The end to end voice connection could be setup
5. The call is successfully released

11.1.5 Short Message Services with A5/3 Ciphering

Description
Both, a mobile originated and terminated SMS is established using A5/3 ciphering.
Reason for test
To ensure ciphering with A5/3 algorithm is possible when this is supported in the network.

Related GSM core specifications
3GPP TS 04.18, 44.018, 24.008, 55.216.

Initial configuration
The 2G network used for this test supports cipher algorithm A5/3 on both BSS and MSC. A second mobile phone is required.

Test procedure
1. Send a SMS from the DUT to the second mobile phone
2. Verify that the DUT sends “A5/3 available” within MOBILE STATION CLASSMARK 2 in CM SERVICE REQUEST to the Network
3. Verify that the DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in CIPHER MODE COMMAND from the network
4. SMS on the receiving 2nd mobile phone is checked.
5. Respond with a SMS from the second mobile phone to the DUT.
6. Verify that the DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in CIPHER MODE COMMAND from the network when the SMS is received.
7. The received SMS is checked.

Expected behaviour
1. The SMS can be sent
2. The device sends “A5/3 available.
3. Cipher mode setting is set to “cipher with algorithm A5/3”
4. The received SMS is identical with the sent one
5. –
6. Cipher mode setting is set to “cipher with algorithm A5/3”
7. The received SMS is identical with the sent one
Annex B: Detailed Test Procedures for a Single RAT / Multi RAT W-CDMA User Equipment

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT W-CDMA User Equipment.

To ensure that all features supported by the UE operate correctly on all supported frequency bands, an appropriate selection of frequency bands shall be used for the following tests.

20 System Access & Registration

20.1 Attach and Detach

20.1.1 IMSI Attach and Detach; Successful

20.1.1.1 IMSI Attach

Description
The DUT shall successfully perform the IMSI attach procedures.

Related 3GPP core specifications
3GPP TS 24.008 4.4.3 (IMSI attach procedure)

Reason for test
To verify that the DUT can successfully perform the IMSI attach procedures.

Initial configuration
Scenario A: DUT is powered off
Scenario B: Flight mode enabled.

Test procedure

<table>
<thead>
<tr>
<th>Scenario A:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Power on DUT.</td>
</tr>
<tr>
<td>4. Receive MT call.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scenario B:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Disable Flight Mode.</td>
</tr>
<tr>
<td>4. Receive MT call.</td>
</tr>
</tbody>
</table>

Expected behaviour

3. DUT performs a Location Updating procedure using Location Updating Type = 2 (IMSI attach).

The network shall respond to DUT with a LOCATION UPDATING ACCEPT that may contain a new TMSI.

If the LOCATION UPDATING ACCEPT contained a new TMSI, then verify that DUT acknowledges this message by sending a TMSI REALLOCATION COMPLETE. Otherwise, no TMSI REALLOCATION COMPLETE shall be sent.

DUT registers the new TMSI correctly

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>←</td>
<td>SYSTEM INFORMATION (BCCH)</td>
<td>MW broadcast</td>
</tr>
<tr>
<td>2</td>
<td>→</td>
<td>RRC CONNECTION REQUEST (CCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>←</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td>RRC</td>
</tr>
</tbody>
</table>
4. Voice Call is successful.

Note: The IMSI attach procedure is used only if the update status is UPDATED and if the stored Location Area Identification is the same as the one which is actually broadcasted on the BCCH of the current serving cell. If the UE indicates Location Updating Type = 0 (Normal location updating), power the UE off and on to verify that it then uses Location Updating Type = 2 (IMSI attach).

20.1.1.2 IMSI Detach

Description
The DUT shall successfully perform detach procedures.

Related 3GPP core specifications
3GPP TS 24.008 4.3.4 (IMSI detach procedure) Reason for test
To verify that the DUT can successfully perform detach procedures.

Initial configuration
Scenario A: DUT is powered on
Scenario B: Flight mode disabled.

Test procedure
Scenario A:
3. Power off DUT.
4. Receive MT call.

Scenario B:
3. Enable Flight Mode.
4. Receive MT call.

Expected behaviour
1. The UE performs the IMSI Detach procedure using the correct TMSI

2. MT Call is unsuccessful.
20.1.2 IMSI Attach; Rejected (Reject Cause #15: No Suitable Cells In Location Area)

Description
The UE shall successfully perform the IMSI attach procedure on another LA of the same PLMN after it was rejected with Reject Cause #15 ‘No Suitable Cells In Location Area’.

Related 3GPP core specifications
3GPP TS 24.008 4.4.4.7 (Location updating not accepted by the network)

Reason for test
To verify that the UE successfully performs the IMSI attach procedure on another LA of the same PLMN after it was rejected with Reject Cause #15 ‘No Suitable Cells In Location Area’.

Initial configuration
- ATT = 1
- No Roaming with the UMTS PLMN ‘A’
- 2 different Location Areas in the UMTS PLMN ‘A’
- Roaming allowed with the GSM PLMN ‘A’
- UE is powered off

Test procedure
1. Power on the UE and verify that the UE sends a LOCATION UPDATING REQUEST to the UMTS network indicating: Location Updating Type = 2 (IMSI attach).
   
   NOTE: The IMSI attach procedure is used only if the update status is UPDATED and if the stored Location Area Identification is the same as the one which is actually broadcasted on the BCCH of the current serving cell. If the UE indicates Location Updating Type = 0 (Normal location updating), power the UE off and on to verify that it then uses Location Updating Type = 2 (IMSI attach).

2. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #15 ‘No Suitable Cells In Location Area’.

3. Check that the UE stores the LAI in the list of "forbidden location areas for roaming".

4. Check that the UE performs a Location Update procedure on the second LA in UMTS technology of the same PLMN.

5. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #15 ‘No Suitable Cells In Location Area’.

6. Check that the UE stores the LAI of the second LA in UMTS technology in the list of "forbidden location areas for roaming".

7. Check that the UE has still stored the LAI of the first LA in UMTS technology in the list of "forbidden location areas for roaming".

8. Check that the UE performs a Location Update procedure on a LA in GSM technology of the same PLMN.

9. The network shall respond to the UE with a LOCATION UPDATING ACCEPT that may contain a new TMSI.

10. If the LOCATION UPDATING ACCEPT contained a new TMSI, then verify that the UE acknowledges this message by sending a TMSI REALLOCATION COMPLETE. Otherwise, no TMSI REALLOCATION COMPLETE shall be sent.

11. Check that the UE is able to receive a call.

Expected behaviour
1. The UE performs a Location Updating procedure using Location Updating Type = 2 (IMSI attach).
3. The UE stores the LAI in the list of “forbidden location areas for roaming”

4. The UE performs a Location Update procedure on a second LA in UMTS technology of the same PLMN.

6. The UE stores the LAI of the second UMTS LA in the list of “forbidden location areas for roaming”.

7. The UE has stored both LAIs from the UMTS PLMN in the list of “forbidden location areas for roaming”. The UE is not reselecting the first LA in UMTS technology of the same PLMN.

8. The UE performs a Location Update procedure on a LA in GSM technology of the same PLMN.

10. The UE registers the new TMSI correctly

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;</td>
<td>SYSTEM INFORMATION (BCCH)</td>
<td>LAI = a, UMTS</td>
</tr>
<tr>
<td>2</td>
<td>&gt;</td>
<td>RRC CONNECTION REQUEST (CCCH)</td>
<td>In UMTS PLMN 'A', LAI = a</td>
</tr>
<tr>
<td>3</td>
<td>&lt;</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>&gt;</td>
<td>RRC CONNECTION SETUP COMPLETE (DCCH)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>&gt;</td>
<td>LOCATION UPDATING REQUEST</td>
<td>Location Updating Type = 2 (IMSI attach)</td>
</tr>
<tr>
<td>6</td>
<td>&lt;</td>
<td>LOCATION UPDATING REJECT</td>
<td>Reject Cause #15 'No Suitable Cells In Location Area'</td>
</tr>
<tr>
<td>7</td>
<td>&lt;</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>&gt;</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>&lt;</td>
<td>SYSTEM INFORMATION (BCCH)</td>
<td>LAI = b, UMTS</td>
</tr>
<tr>
<td>10</td>
<td>&gt;</td>
<td>RRC CONNECTION REQUEST (CCCH)</td>
<td>In UMTS PLMN 'A', LAI = b</td>
</tr>
<tr>
<td>11</td>
<td>&lt;</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>&gt;</td>
<td>RRC CONNECTION SETUP COMPLETE (DCCH)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>&gt;</td>
<td>LOCATION UPDATING REQUEST</td>
<td>Location Updating Type = 2 (IMSI attach)</td>
</tr>
<tr>
<td>14</td>
<td>&lt;</td>
<td>LOCATION UPDATING REJECT</td>
<td>Reject Cause #15 'No Suitable Cells In Location Area'</td>
</tr>
<tr>
<td>15</td>
<td>&lt;</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>&gt;</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>&lt;</td>
<td>SYSTEM INFORMATION (BCCH)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>&gt;</td>
<td>RRC CONNECTION REQUEST (CCCH)</td>
<td>In GSM PLMN 'A', LAI = c</td>
</tr>
<tr>
<td>19</td>
<td>&lt;</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>&gt;</td>
<td>LOCATION UPDATING REQUEST</td>
<td></td>
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<tr>
<td>21</td>
<td>&lt;</td>
<td>AUTHENTICATION REQUEST</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>&gt;</td>
<td>AUTHENTICATION RESPONSE</td>
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<tr>
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<td>SECURITY MODE COMPLETE</td>
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<tr>
<td>25</td>
<td>&lt;</td>
<td>LOCATION UPDATING ACCEPT</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>&gt;</td>
<td>TMSI REALLOCATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>&lt;</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>&gt;</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

11. The UE receives an incoming call.

### 20.1.3 IMSI Attach; Rejected (Reject Cause #13: Roaming not allowed in this Location Area)

**Description**

The UE shall perform a new PLMN selection after being rejected with Reject Cause #13 ‘Roaming not allowed in this location area’.
Related 3GPP core specifications
3GPP TS 24.008 4.4.4.7 (Location updating not accepted by the network)

Reason for test
To verify that the UE successfully performs the IMSI attach procedure on another RAT of the same PLMN after being rejected with Reject Cause #13 'Roaming not allowed in this location area'.

Initial configuration
- ATT = 1
- USIM with "User Controlled PLMN Selector with Access Technology" (EF PLMNwAcT) indicating, in the first position, PLMN ‘A’ and Access Technology Identifier ‘UTRAN’
- USIM with "User Controlled PLMN Selector with Access Technology" (EF PLMNwAcT) indicating, in the second position, PLMN ‘B’ and Access Technology Identifier ‘GSM’ (PLMN ‘B’ may be the same as PLMN ‘A’)
- No Roaming with the UMTS PLMN ‘A’
- 2 different Location Areas in the UMTS PLMN ‘A’
- Roaming allowed with the GSM PLMN ‘B’ (PLMN ‘B’ may be the same as PLMN ‘A’)
- UE is powered off

Test procedure
1. Power on the UE and verify that the UE sends a LOCATION UPDATING REQUEST to the UMTS network.
2. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #13 ‘Roaming not allowed in this location area’.
3. Check that the UE stores the LAI in the list of “forbidden location areas for roaming”.
4. Check that the UE performs a PLMN selection instead of selecting immediately the second LA in UMTS technology of the same PLMN.
5. Check that, after the PLMN selection, the UE performs a Location Update procedure on the second LA in UMTS technology of the same PLMN.
6. The UMTS network shall again respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #13 ‘Roaming not allowed in this location area’.
7. Check that the UE stores the LAI of the second LA in UMTS technology in the list of “forbidden location areas for roaming”.
8. Check that the UE has still stored the LAI of the first LA in UMTS technology in the list of “forbidden location areas for roaming”.
9. Check that, after a new PLMN selection, the UE performs a Location Update procedure on a LA in GSM technology of PLMN ‘B’.
10. The network shall respond to the UE with a LOCATION UPDATING ACCEPT.
11. Check that the UE is able to receive a call.

Expected behaviour
1. The UE performs a Location Updating procedure.
3. The UE stores the LAI in the list of “forbidden location areas for roaming”.
4. The UE performs a new PLMN selection.
5. The UE performs a Location Update procedure on a second LA in UMTS technology of the same PLMN.
6. -
7. The UE stores the LAI of the second UMTS LA in the list of “forbidden location areas for roaming”.

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8. The UE has stored both LAIs from the UMTS PLMN in the list of “forbidden location areas for roaming”.

9. The UE performs a new PLMN selection. The UMTS LAs can’t be selected. The UE performs a Location Update procedure on a LA in GSM technology of PLMN ‘B’.

10. The UE registers correctly.

11. The UE receives an incoming call.

## 20.2 GPRS Attach and Detach

### 20.2.1 GPRS Attach and Detach; Successful

#### 20.2.1.1 GPRS Attach

**Description**

The DUT shall successfully perform GPRS Attach under default network conditions.

**Related 3GPP core specifications**

3GPP TS 24.008 4.7.3 (GPRS attach procedure)

**Reason for test**

To verify that the DUT can successfully perform the GPRS Attach procedure under default network conditions.

**Initial configuration**

Scenario A: DUT is powered off

Scenario B: Flight mode enabled

Automatic GPRS attach is enabled.

**Test procedure**

**Scenario A: Power ON**

1. Power on the DUT.
2. Open the browser.

**Scenario B: Flight Mode**

1. Disable Flight Mode.
2. Open the browser.

**Expected behaviour**

2. DUT sends an ATTACH REQUEST to the network.

   The network shall respond to the DUT with an ATTACH ACCEPT that may contain a new P-TMSI.

   If the ATTACH ACCEPT contained a new P-TMSI, then verify that the DUT acknowledges this message by sending an ATTACH COMPLETE. Otherwise, no ATTACH COMPLETE shall be sent.

   The UE registers the new P-TMSI correctly.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
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<tbody>
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<td>←</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>4</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE (DCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>ATTACH REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>AUTHENTICATION AND CIPHERING REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>AUTHENTICATION AND CIPHERING RESPONSE</td>
<td>GMM</td>
</tr>
</tbody>
</table>
### 20.2.1.2 GPRS Detach

**Description**  
The DUT shall successfully perform GPRS detach procedures under default network conditions.

**Related 3GPP core specifications**  
3GPP TS 24.008 4.7.4 (GPRS detach procedure)

**Reason for test**  
To verify that the DUT can successfully perform the GPRS Detach procedure under default network conditions.

**Initial configuration**  
Scenario A: DUT is powered ON.  
Scenario B: Flight Mode is disabled.

**Test procedure**

**Scenario A:**
1. Power off DUT.

**Scenario B:**
1. Enable Flight Mode.  
2. Open the browser

**Expected behaviour**

1. DUT sends a DETACH REQUEST indicating Detach type = “power switched off, GPRS detach” using the correct TMSI.  
The network shall not acknowledge this message.  
2. The browser page does not load.

### 20.2.2 GPRS Attach; Rejected (GPRS services not allowed)

**NOTE:** This test is network infrastructure specific – should be performed in different infrastructures:  
#7 GPRS services not allowed (e.g. Ericsson)  
#14 GPRS services not allowed in this PLMN (e.g. NEC-SGSN)

**Description**

Check the UE’s behaviour on the reject message ‘GPRS services not allowed’.

**Related 3GPP core specifications**

3GPP TS 24.008 4.7.3 (GPRS attach procedure)

**Reason for test**

To verify that the UE behaves correctly on a reject message ‘GPRS services not allowed’.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>RRC</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>RRC</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>ATTACH ACCEPT</td>
<td>GMM</td>
</tr>
<tr>
<td>11</td>
<td>→</td>
<td>ATTACH COMPLETE</td>
<td>GMM</td>
</tr>
<tr>
<td>12</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td>RRC</td>
</tr>
</tbody>
</table>
Initial configuration

- UE is powered off with valid P-TMSI, P-TMSI signature and RAI
- Network does not allow GPRS services (e.g. no GPRS Roaming Agreement)

Test procedure

1. Power on the UE and attempt the GPRS Attach procedure.
2. GMM cause at the time of sending the Attach Reject message varies depending on the network:
   - #7 GPRS services not allowed (e.g. Ericsson)
   - #14 GPRS services not allowed in this PLMN (e.g. NEC-SGSN)
3. Move the UE into a different PLMN of the same country (e.g. through manual network selection).
4. Trigger a GPRS Attach procedure (e.g. via AT command). Check whether the UE registers to the new network.

Expected behaviour

1. The UE is performing successfully an IMSI Attach procedure.
2. The UE attempts to perform a GPRS Attach procedure.
4a. If Reject Cause was ‘#7 GPRS services not allowed (e.g. Ericsson)’: The UE does not attempt at all to perform a GPRS Attach procedure until it is powered off or the SIM card is removed. The P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number is deleted.
4b. If Reject Cause was ‘#14 GPRS services not allowed in this PLMN (e.g. NEC-SGSN)’: The P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number is deleted. The UE will re-attempt to perform a GPRS Attach procedure in the new PLMN.

20.2.3 Network Initiated GPRS Detach, Re-attach not required (#7 GPRS services not allowed)

Description

Check the UE’s behaviour at network initiated GPRS Detach, when the network indicates that Re-attach is not required.

Related 3GPP core specifications

3GPP TS 24.008 4.7.4.2 (Network initiated GPRS detach procedure)

Reason for test

To verify that the UE does not perform any GPRS Attach procedure before it is powered off and on again.

Initial configuration

UE is idle and GPRS Attached.

Test procedure

1. The NW sends the Detach Request message (Detach type = ‘re-attach not required’, Cause =#7 ‘GPRS services not allowed’).
2. Check the GPRS display indication.
3. Attempt to perform a GPRS Attach procedure via AT command.
4. Perform a GPRS Attach after the UE is powered off and powered on again.

Expected behaviour

1. The UE returns the Detach Accept message at the time of the reception of the Detach Request message. The UE does not indicate GPRS services any more on the display.
2. The UE does not indicate GPRS services on the display.
3. When the UE receives the Detach Request message (Detach type = ‘re-attach not required’, Cause =#7 ‘GPRS services not allowed’) from the NW, the UE
   - does not perform GPRS Attach
   - deletes the stored RAI, P-TMSI, P-TMSI signature, and GPRS-CKSN.
4. The UE performs GPRS Attach after it is powered off and powered on again.

20.2.4 Network Initiated GPRS Detach, Re-attach not required (#14 GPRS service not allowed in this PLMN)

Description
Check the UE’s behaviour at network initiated GPRS Detach, when the network indicates that Re-attach is not required.

Related 3GPP core specifications
3GPP TS 24.008 4.7.4.2 (Network initiated GPRS detach procedure)

Reason for test
To verify that the UE does not perform any GPRS Attach procedure before it has changed the PLMN.

Initial configuration
UE is idle and GPRS Attached.

Test procedure
1. The NW sends the Detach Request message (Detach type = ‘re-attach not required’, Cause =#14 ‘GPRS services not allowed in this PLMN’).
2. Check the GPRS display indication.
3. Attempt to perform a GPRS Attach procedure in this PLMN via AT command.
4. Move the UE into a different PLMN and trigger a GPRS Attach procedure.

Expected behaviour
1. The UE returns the Detach Accept message at the time of the reception of the Detach Request message. The UE does not indicate GPRS services any more on the display.
2. The UE does not indicate GPRS services on the display.
3. When the UE receives the Detach Request message (Detach type = ‘re-attach not required’, Cause =#14 ‘GPRS services not allowed in this PLMN’) from the NW, the UE
   - Cannot perform GPRS Attach
   - deletes the stored RAI, P-TMSI, P-TMSI signature, and GPRS-CKSN.
4. The UE performs the GPRS Attach procedure.

20.3 Combined Attach and Detach (in NMO1)

20.3.1 Combined Attach and Detach; Successful

20.3.1.1 Combined Attach

Description
The DUT shall successfully perform the combined attach procedures.

Related 3GPP core specifications
3GPP TS 24.008 4.7.3 (GPRS attach procedure)

Reason for test
To verify that the DUT can successfully perform the combined attach procedures.
Initial configuration
Scenario A: DUT is powered off
Scenario B: Flight mode enabled.

Test procedure
Scenario A: Power ON
1. Power on DUT.
2. Receive MT Call.
3. Open Browser.

Scenario B: Flight Mode OFF
1. Disable Flight Mode.
2. Receive MT Call.
3. Open Browser.

Expected behaviour
4. DUT sends a combined ATTACH REQUEST to the network.
   ATTACH REQUEST message, the “Attach type” parameter holds the “Combined GPRS / IMSI attach” value.
   ATTACH ACCEPT message, the “Attach result” parameter holds the “Combined GPRS / IMSI attached” value.
   If the ATTACH ACCEPT contained a new “TMSI/P-TMSI” value, then verify that the UE acknowledges this message by sending an ATTACH COMPLETE. Otherwise, no ATTACH COMPLETE shall be sent.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
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<tr>
<td>3</td>
<td>←</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>4</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE (DCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>ATTACH REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>6</td>
<td>→</td>
<td>AUTHENTICATION AND CIPHERING REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>7</td>
<td>←</td>
<td>AUTHENTICATION AND CIPHERING RESPONSE</td>
<td>GMM</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>RRC</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>RRC</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>ATTACH ACCEPT</td>
<td>GMM, New TMSI/P-TMSI</td>
</tr>
<tr>
<td>11</td>
<td>←</td>
<td>ATTACH COMPLETE</td>
<td>GMM</td>
</tr>
<tr>
<td>12</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td>RRC</td>
</tr>
</tbody>
</table>

5. Voice call is successful
6. The browser is opened and a page loads successfully.

Note: If it is the first time the handset attaches on the network (it was on another one beforehand), check that in the ATTACH REQUEST message the “type of identity” parameter holds the “IMSI” value. If it is not the first time the handset attaches, check that in the ATTACH REQUEST message the “type of identity” parameter holds the “TMSI/P-TMSI” value.

20.3.1.2 Combined Detach

Description
The DUT shall successfully perform the combined detach procedures.
Related 3GPP core specifications
3GPP TS 24.008 4.7.4 (GPRS detach procedure)

Reason for test
To verify that the DUT can successfully perform the combined detach procedures.

Initial configuration
Scenario A: DUT is powered on.
Scenario B: Flight Mode is disabled.

Test procedure

Scenario A: Power OFF
3. Power off DUT.
4. Receive MT Call.

Scenario B: Flight Mode ON
3. Enable Flight Mode.
4. Receive MT Call.
5. Open the browser.

Expected behaviour
1. DUT sends a DETACH REQUEST message, the “Detach type” parameter holds the “power switched off, combined GPRS / IMSI detach” value. If the detach is not done at power off, the “Detach type” parameter will hold the “normal, combined GPRS / IMSI detach” value and the network will answer back to the DETACH REQUEST with a DETACH ACCEPT message.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>←</td>
<td>SYSTEM INFORMATION (BCCH)</td>
<td>MW broadcast</td>
</tr>
<tr>
<td>2</td>
<td>→</td>
<td>RRC CONNECTION REQUEST (CCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>←</td>
<td>RRC CONNECTION SETUP (CCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>4</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE (DCCH)</td>
<td>RRC</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>ATTACH REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>AUTHENTICATION AND CIPHERING REQUEST</td>
<td>GMM</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>AUTHENTICATION AND CIPHERING RESPONSE</td>
<td>GMM</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>RRC</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>RRC</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>ATTACH ACCEPT</td>
<td>GMM, New TMSI/P-TMSI</td>
</tr>
<tr>
<td>11</td>
<td>→</td>
<td>ATTACH COMPLETE</td>
<td>GMM</td>
</tr>
<tr>
<td>12</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td>RRC</td>
</tr>
</tbody>
</table>

2. MT call is unsuccessful.
3. The Browser Page does not load.

20.4 Location Updating

20.4.1 Normal Location Updating

20.4.1.1 Normal Case

Description
The UE can successfully perform a normal location update after camping onto a serving cell with a different LAI.
Related 3GPP core specifications
3GPP TS 24.008 4.4.1 (Location updating procedure)

Reason for test
To verify that the UE can successfully perform a normal location update after camping onto a serving cell with a different LAI.

Initial configuration
The UE is attached in Circuit mode.

Test procedure
1. Move the UE from the initial cell into a cell with a different LAI till the UE performs a cell reselection.
2. The UE shall send a LOCATION UPDATE REQUEST message to the network. Check whether the "location updating type" parameter holds the "normal" value.
3. The network shall then send a LOCATION UPDATE ACCEPT message to the UE. This message contains a new TMSI for the UE and the LAI for the new cell.
4. Check that the UE responds to paging in the new cell by calling the UE.

Expected behaviour
The UE performs a ‘Normal Location Update’ procedure and receives an incoming call.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td>&quot;Establishment cause&quot;: Registration.</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = normal, &quot;CKSN&quot; = CKSN1, &quot;location area identification&quot; = a, &quot;mobile station classmark 1&quot; and &quot;mobile identity&quot; = TMSI1.</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>MM</td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
<td>MM</td>
</tr>
<tr>
<td>7</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>SECURITY MODE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>←</td>
<td>LOCATION UPDATING ACCEPT</td>
<td>&quot;Mobile identity&quot; = new TMSI (=TMSI2), LAI = b.</td>
</tr>
<tr>
<td>10</td>
<td>➔</td>
<td>TMSI REALLOCATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>➔</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

20.4.1.2 Normal Location Updating with TMSI unknown in VLR

Description
The UE successfully performs a normal location update procedure after camping onto a serving cell with a different LAI and a TMSI which is unknown to the VLR.

Related 3GPP core specifications
3GPP TS 24.008 4.4.1 (Location updating procedure)

Reason for test
To verify that the UE can successfully perform a normal location update after camping onto a serving cell with a different LAI and a TMSI which is unknown to the VLR.

Initial configuration
The UE is attached in Circuit mode.

TMSI unknown in VLR can be provoked by following scenarios:
Changing PLMNs
Using two identical (U)SIM cards which are registered in the network at the same time
Alternatively: Change TMSI and LAI on the (U)SIM to a different but valid figure and then perform an IMSI Attach Procedure.

Test procedure
1. Move the UE from the initial cell into a cell with a different LAI till the UE performs a cell reselection.
2. The UE shall send a LOCATION UPDATE REQUEST message to the network containing a TMSI which is not known by the network. Check whether the “location updating type” parameter holds the “normal” value.
3. Check that the network initiates an Identification Procedure requesting the UE’s IMSI.
4. Check that the UE sends its IMSI to the network.
5. The network shall then send a LOCATION UPDATE ACCEPT message to the UE. This message contains a new TMSI for the UE and the LAI for the new cell.
6. Check that the UE is not indicating loss of coverage.
7. Check that the UE responds to paging in the new cell by calling the UE.

Expected behaviour
The UE performs the ‘Normal Location Update’ procedure (including Identification Procedure) without coverage loss indication and receives an incoming call.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td>“Establishment cause”: Registration.</td>
</tr>
<tr>
<td>2</td>
<td>⇐</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>LOCATION UPDATING REQUEST</td>
<td>“location updating type” = normal, “CKSN” = CKSN1, “location area identification” = a, “mobile station classmark 1” and “mobile identity” = TMSI1.</td>
</tr>
<tr>
<td>5</td>
<td>⇐</td>
<td>IDENTITY REQUEST</td>
<td>IMSI</td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>IDENTITY RESPONSE</td>
<td>UE responds with its IMSI</td>
</tr>
<tr>
<td>7</td>
<td>⇐</td>
<td>AUTHENTICATION REQUEST</td>
<td>MM</td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
<td>MM</td>
</tr>
<tr>
<td>9</td>
<td>⇐</td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>➔</td>
<td>SECURITY MODE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>⇐</td>
<td>LOCATION UPDATING ACCEPT</td>
<td>“Mobile identity” = new TMSI (=TMSI2), LAI = b.</td>
</tr>
<tr>
<td>12</td>
<td>➔</td>
<td>TMSI REALLOCATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>⇐</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>➔</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

20.4.1.3 Normal Location Updating; Rejected (Reject Cause #15: No Suitable Cells In Location Area)

Description
The UE shall successfully perform the Normal Location Update procedure on another LA of the same PLMN after it was rejected with Reject Cause #15 ‘No Suitable Cells In Location Area’.

Related 3GPP core specifications
3GPP TS 24.008 4.4.4.7 (Location updating not accepted by the network)
Reason for test
To verify that the UE successfully performs the Normal Location Updating Procedure on another LA of
the same PLMN after it was rejected with Reject Cause #15 ‘No Suitable Cells In Location Area’.

Initial configuration
- The UE is attached in Circuit mode in GSM mode, PLMN A, LAI = a
- No Roaming with the UMTS PLMN ‘A’, LAI = b
- No Roaming with the UMTS PLMN ‘A’, LAI = c
- Roaming allowed with the GSM PLMN ‘A’, LAI = d

Test procedure
1. Move the UE from the initial GSM cell of PLMN A into a UMTS cell of PLMN A with LAI = b
   until the UE performs a cell reselection.
2. The UE shall send a LOCATION UPDATE REQUEST message to the UMTS network. Check
   whether the “location updating type” parameter holds the “normal” value.
3. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with
   Reject Cause #15 ‘No Suitable Cells In Location Area’.
4. Check that the UE stores the LAI in the list of “forbidden location areas for roaming”.
5. Move the UE from the UMTS cell of PLMN A with LAI = b into UMTS cell of PLMN A with LAI = c
   until the UE performs a cell reselection
6. The UE shall send a LOCATION UPDATE REQUEST message to the UMTS network. Check
   whether the “location updating type” parameter holds the “normal” value.
7. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with
   Reject Cause #15 ‘No Suitable Cells In Location Area’.
8. Check that the UE stores the LAI in the list of “forbidden location areas for roaming”.
9. Check that the UE has stored both LAIs in the list of “forbidden location areas for roaming”.
10. Check that the UE performs a Location Update procedure on LA = d in GSM technology of
    the same PLMN.
11. The network shall respond to the UE with a LOCATION UPDATING ACCEPT containing a
    new TMSI.
12. Check that the UE is able to receive a call.

Expected behaviour
2. The UE performs a Normal Location Updating procedure.
4. The UE stores the LAI in the list of “forbidden location areas for roaming”
5. The UE performs a Normal Location Updating procedure.
7. The UE stores the LAI in the list of “forbidden location areas for roaming”. The UE is not
   reselecting the first LA in UMTS technology of the same PLMN.
10. The UE performs a Location Update procedure on LA = d in GSM technology of the same
    PLMN.
11. The UE registers the new TMSI correctly

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Î</td>
<td>RRC CONNECTION REQUEST</td>
<td>In PLMN ‘A’, LAI = b, UMTS technology, “Establishment cause”: Registration</td>
</tr>
<tr>
<td>2</td>
<td>Ç</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Î</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Î</td>
<td>LOCATION UPDATING REQUEST</td>
<td>“location updating type” = normal, “CKSN” = CKSN1, “location area”</td>
</tr>
</tbody>
</table>
### 20.4.1.4 Normal Location Updating; Rejected (Reject Cause #12: Location Area Not Allowed)

#### Description

The UE shall successfully perform the Normal Location Update procedure on another LA of the same PLMN after it was rejected with Reject Cause #12 ‘Location Area Not Allowed’.

#### Related 3GPP core specifications

3GPP TS 24.008 4.4.4.7 (Location updating not accepted by the network)

#### Reason for test

To verify that the UE successfully performs the Normal Location Updating Procedure on another LA of the same PLMN after it was rejected with Reject Cause #12 ‘Location Area Not Allowed’.

#### Initial configuration

- The UE is attached in Circuit mode in GSM mode, PLMN A, LAI = a
- No Roaming with the UMTS PLMN ‘A’, LAI = b
- No Roaming with the UMTS PLMN ‘A’, LAI = c

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>→</td>
<td>LOCATION UPDATING REJECT</td>
<td>Reject Cause #15 ‘No Suitable Cells In Location Area’</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>→</td>
<td>RRC CONNECTION REQUEST</td>
<td>In PLMN ‘A’, LAI = c, UMTS technology, “Establishment cause”: Registration</td>
</tr>
<tr>
<td>9</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>→</td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = normal, &quot;location area identification&quot; = a, &quot;mobile station classmark 1&quot; and &quot;mobile identity&quot; = IMSI.</td>
</tr>
<tr>
<td>12</td>
<td>→</td>
<td>LOCATION UPDATING REJECT</td>
<td>Reject Cause #15 ‘No Suitable Cells In Location Area’</td>
</tr>
<tr>
<td>13</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>→</td>
<td>RRC CONNECTION REQUEST</td>
<td>In PLMN ‘A’, LAI = d, GSM technology, “Establishment cause”: Registration</td>
</tr>
<tr>
<td>16</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>→</td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = normal, &quot;location area identification&quot; = a, &quot;mobile station classmark 1&quot; and &quot;mobile identity&quot; = IMSI.</td>
</tr>
<tr>
<td>19</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
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</tr>
<tr>
<td>21</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>←</td>
<td>LOCATION UPDATING ACCEPT</td>
<td>&quot;Mobile identity&quot; = new TMSI (=TMSI2), LAI = d.</td>
</tr>
<tr>
<td>24</td>
<td>→</td>
<td>TMSI REALLOCATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

12. The UE receives an incoming call.
• Roaming allowed with the GSM PLMN ‘A’, LAI = d

Test procedure
1. Move the UE from the initial GSM cell of PLMN A into a UMTS cell of PLMN A with LAI = b until the UE performs a cell reselection.
2. The UE shall send a LOCATION UPDATE REQUEST message to the UMTS network. Check whether the “location updating type” parameter holds the “normal” value.
3. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #15 ‘Location Area Not Allowed’.
4. Check that the UE stores the LAI in the list of “forbidden location areas for regional provision of service”.
5. Move the UE from the UMTS cell of PLMN A with LAI = b into UMTS cell of PLMN A with LAI = c until the UE performs a cell reselection.
6. The UE shall send a LOCATION UPDATE REQUEST message to the UMTS network. Check whether the “location updating type” parameter holds the “normal” value.
7. The UMTS network shall respond to the UE with a LOCATION UPDATING REJECT with Reject Cause #12 ‘Location Area Not Allowed’.
8. Check that the UE stores the LAI in the list of “forbidden location areas for roaming”.
9. Check that the UE has stored both LAIs in the list of “forbidden location areas for regional provision of service”.
10. Check that the UE performs a Location Update procedure on LA = d in GSM technology of the same PLMN.
11. The network shall respond to the UE with a LOCATION UPDATING ACCEPT containing a new TMSI.
12. Check that the UE is able to receive a call.

Expected behaviour
2. The UE performs a Normal Location Updating procedure.
4. The UE stores the LAI in the list of “forbidden location areas for regional provision of service”.
6. The UE performs a Normal Location Updating procedure.
8. The UE stores the LAI in the list of “forbidden location areas for roaming”. The UE is not reselecting the first LA in UMTS technology of the same PLMN.
10. The UE performs a Location Update procedure on LA = d in GSM technology of the same PLMN.
11. The UE registers the new TMSI correctly.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td>In PLMN ‘A’, LAI = b, UMTS technology, &quot;Establishment cause&quot;: Registration</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = normal, &quot;CKSN&quot; = CKSN1, &quot;location area identification&quot; = a, &quot;mobile station classmark 1&quot; and &quot;mobile identity&quot; = TMSI1.</td>
</tr>
<tr>
<td>5</td>
<td>➔</td>
<td>LOCATION UPDATING REJECT</td>
<td>Reject Cause #12 ‘Location Area Not Allowed’</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>➔</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td>In PLMN ‘A’, LAI = c, UMTS technology, &quot;Establishment cause&quot;:</td>
</tr>
</tbody>
</table>
Step | Direction | Message | Comments
--- | --- | --- | ---
9 | UE - NW | RRC CONNECTION SETUP | Registration
10 | UE - NW | RRC CONNECTION SETUP COMPLETE |
11 | UE | LOCATION UPDATING REQUEST | "location updating type" = normal, "location area identification" = a, "mobile station classmark 1" and "mobile identity" = IMSI.
12 | UE | LOCATION UPDATING REJECT | Reject Cause #12 'Location Area Not Allowed'
13 | UE - NW | RRC CONNECTION RELEASE |
14 | UE - NW | RRC CONNECTION RELEASE COMPLETE |
15 | UE | RRC CONNECTION REQUEST | In PLMN 'A', LAI = d, GSM technology, "Establishment cause": Registration
16 | UE - NW | RRC CONNECTION SETUP |
17 | UE - NW | RRC CONNECTION SETUP COMPLETE |
18 | UE | LOCATION UPDATING REQUEST | "location updating type" = normal, "location area identification" = a, "mobile station classmark 1" and "mobile identity" = IMSI.
19 | UE - NW | AUTHENTICATION REQUEST |
20 | UE | AUTHENTICATION RESPONSE |
21 | UE - NW | SECURITY MODE COMMAND |
22 | UE - NW | SECURITY MODE COMPLETE |
23 | UE - NW | LOCATION UPDATING ACCEPT | "Mobile identity" = new TMSI (=TMSI2), LAI = d.
24 | UE | TMSI REALLOCATION COMPLETE |
25 | UE - NW | RRC CONNECTION RELEASE |
26 | UE - NW | RRC CONNECTION RELEASE COMPLETE |

12. The UE receives an incoming call.

### 20.4.2 Periodic Location Area Updating

#### 20.4.2.1 Periodic Location Area Update successful

**Description**
The DUT shall successfully perform a Periodic Location Area Update after the T3212 timer has expired.

**Related 3GPP core specifications**
3GPP TS 24.008 4.4.2 (Periodic updating)

**Reason for test**
To verify the DUT successfully performs a Periodic Location Area Update after the T3212 timer has expired.

**Initial configuration**
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

**Test procedure**
1. Power on DUT (or disable Flight Mode).
2. Leave DUT in Idle until T3212 timer has expired (X minutes).
3. Observe behaviour when T3212 timer has expired.
4. Receive MT Voice Call / MT SMS.
Expected behaviour

1. DUT is powered on and T3212 timer commences.
2. DUT is in Idle mode and T3212 timer is running.
3. DUT sends a Location Update Request message to the network.
   - Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   - Confirm the DUT receives “Location Update Accept” from the network.
4. MT Voice Call / MT SMS is successful.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>RRC CONNECTION REQUEST</td>
<td>&quot;Establishment cause&quot;: Registration.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>LOCATION UPDATING REQUEST</td>
<td>&quot;location updating type&quot; = periodic</td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td>AUTHENTICATION REQUEST</td>
<td>Optional</td>
</tr>
<tr>
<td>(6)</td>
<td></td>
<td>AUTHENTICATION RESPONSE</td>
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</tr>
<tr>
<td>(7)</td>
<td></td>
<td>SECURITY MODE COMMAND</td>
<td>Optional</td>
</tr>
<tr>
<td>(8)</td>
<td></td>
<td>SECURITY MODE COMPLETE</td>
<td>Optional</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>LOCATION UPDATING ACCEPT</td>
<td></td>
</tr>
<tr>
<td>(10)</td>
<td></td>
<td>TMSI REALLOCATION COMPLETE</td>
<td>Optional</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>RRC CONNECTION RELEASE</td>
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</tr>
<tr>
<td>12</td>
<td></td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

20.4.2.2 Reset of T3212 timer

Description
The DUT shall successfully reset its T3212 timer when a) T3212 timer has expired, b) Voice Call is made or received, c) SMS is made or received, d) Supplementary service command is sent.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure

Scenario A: T3212 timer expired
1. Power on DUT (or disable Flight Mode).
2. Leave DUT in Idle until T3212 timer has expired (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Scenario B: Voice Call is made or received
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform MO or MT Voice Call. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.
Scenario C: SMS is sent or received
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform MO or MT SMS. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Scenario D: Supplementary Service command sent
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. After a time less than Time X, perform Supplementary Service command. Note the time (Time B).
3. Wait for T3212 timer to expire (Time C).
4. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. The T3212 timer is reset at Time B.
3. Confirm T3212 timer expires at Time C. This should be X minutes after Time B.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
4. MT Voice Call / MT SMS is successful.

20.4.2.3 DUT out of coverage (back in coverage before T3212 expiry)

Description
The DUT shall not reset its T3212 timer when it loses coverage or regains coverage until the T3212 timer has expired.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to out of coverage area. Note the time (Time B).
   Leave DUT out of coverage for ¾ of the T3212 timer value (¾ of X minutes).
3. After ¾ of X minutes, bring DUT back into coverage. Note the time (Time C).
4. Wait for T3212 timer to expire (Time D).
5. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is out of coverage.
3. DUT is back in coverage.
4. Confirm T3212 timer expires at Time D. This should be X minutes after Time A.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
5. MT Voice Call / MT SMS is successful.

20.4.2.4 DUT out of coverage (back in coverage after T3212 expiry)

Description
The DUT immediately performs Periodic Location Area Update when it regains coverage when the T3212 timer has expired during out of coverage.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to out of coverage area. Note the time (Time B).
   Leave DUT out of coverage for a period greater than the T3212 timer value (greater than X minutes).
3. After a period greater than X minutes, bring DUT back into coverage. Note the time (Time C).
4. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is out of coverage.
3. DUT is back in coverage.
   DUT immediately sends a Location Update Request message to the network at Time C.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
4. MT Voice Call / MT SMS is successful.

20.4.2.5 DUT Emergency Camping (back in coverage before T3212 expiry)

Description
The DUT shall not reset its T3212 timer when it is in Emergency Camping and regains coverage until the T3212 timer has expired.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)
Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to an area where it is Emergency Camping. Note the time (Time B).
   Leave DUT in Emergency Camping for a period greater than the T3212 timer value (greater than X minutes).
3. After a period greater than X minutes, bring DUT back into coverage. Note the time (Time C).
4. Wait for T3212 timer to expire (Time D).
5. Receive MT Voice Call / MT SMS.

Expected behaviour
1. DUT is powered on and T3212 timer commences.
2. DUT is Emergency Camping.
3. DUT is back in coverage.
4. Confirm T3212 timer expires at Time D. This should be X minutes after Time A.
   DUT sends a Location Update Request message to the network.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives "Location Update Accept" from the network.
5. MT Voice Call / MT SMS is successful.

20.4.2.6 DUT Emergency Camping (back in coverage after T3212 expiry)

Description
The DUT immediately performs Periodic Location Area Update when it regains coverage when the
T3212 timer has expired during Emergency Camping.

Related 3GPP core specifications
3GPP TS 24.008 4.4.2 (Periodic updating)

Reason for test
To verify the DUT successfully resets its periodic location update timer T3212.

Initial configuration
DUT is powered off (or Flight Mode enabled).
T3212 timer value for network under test is known to the tester (X minutes).

Test procedure
1. Power on DUT (or disable Flight Mode). Note the time (Time A).
2. Move DUT to an area where it is Emergency Camping. Note the time (Time B).
   Leave DUT in Emergency Camping for a period greater than the T3212 timer value (greater than X minutes).
3. After a period greater than X minutes, bring DUT back into coverage. Note the time (Time C).
4. Receive MT Voice Call / MT SMS.
Expected behaviour

1. DUT is powered on and T3212 timer commences.
2. DUT is Emergency Camping.
3. DUT is back in coverage.
   DUT immediately sends a Location Update Request message to the network at Time C.
   Within the Location Update Request message, confirm the “Location Updating Type” parameter holds the “periodic updating” value.
   Confirm the DUT receives “Location Update Accept” from the network.
4. MT Voice Call / MT SMS is successful.

20.5 Routing Area Update

20.5.1 Routing Area Update; Successful

Description

The UE can successfully perform a normal Routing Area Update after camping onto a serving cell with a different RAC.

Related 3GPP core specifications

3GPP TS 24.008 4.7.5 (Routing area updating procedure)

Reason for test

To verify that the UE can successfully perform a normal Routing Area Update after camping onto a serving cell with a different RAC.

Initial configuration

The UE is attached in packet mode.

Test procedure

1. Move the UE from the initial cell into a cell with a different RAC till the UE performs a cell reselection.
2. The UE shall send a ROUTING AREA UPDATE REQUEST message to the network. Check whether the “update type” parameter holds the “RA updating” value.
3. The network shall then send a ROUTING AREA UPDATE ACCEPT message to the UE. This message contains a new P-TMSI for the UE and the RAC for the new cell.
4. Check that the UE can establish a packet switched data connection.

Expected behaviour

The UE performs a ‘Routing Area Update’ procedure and can establish a packet switched data connection.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>RRC CONNECTION REQUEST</td>
<td>&quot;Establishment cause&quot;: Registration.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>ROUTING AREA UPDATING REQUEST</td>
<td>Update type = ‘RA updating’ P-TMSI 1 signature Routing area identity = RAI 1</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>AUTHENTICATION AND CIPHERING REQUEST</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>AUTHENTICATION AND CIPHERING RESPONSE</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>SECURITY MODE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>ROUTING AREA UPDATING ACCEPT</td>
<td>Update result = ‘RA updated’ P-TMSI 2 signature</td>
</tr>
</tbody>
</table>

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20.5.2 Combined Routing Area and Location Area Update (NMO1)

**Description**
The UE shall successfully perform the combined Routing Area and Location Area Update procedures.

**Related 3GPP core specifications**
3GPP TS 24.008 4.7.5.2 (Combined routing area updating procedure)

**Reason for test**
To verify that the UE can successfully perform the combined Routing Area and Location Area Update procedures.

**Initial configuration**
The UE is attached in Packet and Circuit mode.

**Test procedure**
1. Move the UE from the initial cell into a cell with a different LAI/RAC till the UE performs a cell reselection.
2. Verify that the UE sends a combined ROUTING AREA UPDATING REQUEST message to the network.
3. Check that in the ROUTING AREA UPDATING REQUEST message, the “Update type” parameter holds the “Combined RA/LA updating” value.
4. Check that in the ROUTING AREA UPDATING ACCEPT message, the “Update result” parameter holds the “Combined RA/LA updated” value.
5. Verify that the UE stores the new “TMSI/P-TMSI” value and acknowledges the ROUTING AREA UPDATING ACCEPT message by sending a ROUTING AREA UPDATING COMPLETE message.
6. Check that the UE responds to paging in the new cell by calling the UE.
7. Check that the UE can establish a packet data connection in the new cell.

**Expected behaviour**

2. The UE performs a combined Routing Area Updating procedure as follows:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
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<td>ROUTING AREA UPDATING COMPLETE</td>
<td>Routing area identity = RAI 2</td>
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<tr>
<td>11</td>
<td>←</td>
<td>RRC CONNECTION RELEASE</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>➔</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>ROUTING AREA UPDATING REQUEST</td>
<td>Update type = ‘Combined RA/LA updating’ P-TMSI 1 signature Routing area identity = RAI 1</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>AUTHENTICATION AND CIPHERING REQUEST</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>AUTHENTICATION AND CIPHERING RESPONSE</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>SECURITY MODE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>←</td>
<td>ROUTING AREA UPDATING ACCEPT</td>
<td>Update result = ‘Combined RA/LA updated’ Mobile identity = P-TMSI 2 Routing area identity = RAI 2</td>
</tr>
<tr>
<td>10</td>
<td>➔</td>
<td>ROUTING AREA UPDATING COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>
3. In the ROUTING AREA UPDATING REQUEST message, the "Update type" parameter holds the "Combined RA/LA updating" value.
4. In the ROUTING AREA UPDATING ACCEPT message, the "Update result" parameter holds the "Combined RA/LA updated" value.
5. The UE stores the new "TMSI/P-TMSI" value and acknowledges the ROUTING AREA UPDATING ACCEPT message by sending a ROUTING AREA UPDATING COMPLETE message.
6. The UE receives an incoming call in the new cell.
7. The UE can establish a packet data connection in the new cell.

### 20.5.3 Periodic Routing Area Update

**Description**
The UE successfully performs a Periodic Routing Area Update after the expiry of the T3312 timer.

**Related 3GPP core specifications**
3GPP TS 24.008 4.7.5 (Routing area updating procedure)

**Reason for test**
To verify that the UE successfully performs a Periodic Routing Area Update after the expiry of the T3312 timer.

**Initial configuration**
The UE shall be attached in Packet mode and in idle state, T3312 is reset.

**Test procedure**
1. Wait for the T3312 timer to expire, and observe if the UE sends the network a ROUTING AREA UPDATE REQUEST message. Check whether the "update type" parameter holds the "periodic updating" value.
2. The network shall then send a ROUTING AREA UPDATE ACCEPT message to the UE.
3. Check that the UE can establish a packet data connection after the Periodic Routing Area Update procedure.

**Expected behaviour**
The UE performs a 'Periodic Routing Area Update' procedure and can establish a packet data connection after the Periodic Routing Area Update procedure.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRC CONNECTION REQUEST</td>
<td>&quot;Establishment cause&quot;: Registration.</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>→</td>
<td>ROUTING AREA UPDATING REQUEST</td>
<td>&quot;update type&quot; = periodic updating</td>
</tr>
<tr>
<td>(5)</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>Optional</td>
</tr>
<tr>
<td>(6)</td>
<td>←</td>
<td>AUTHENTICATION RESPONSE</td>
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<td>(7)</td>
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<td>SECURITY MODE COMMAND</td>
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<tr>
<td>(8)</td>
<td>→</td>
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<td>9</td>
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<td>ROUTING AREA UPDATING ACCEPT</td>
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<td>(10)</td>
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<tr>
<td>11</td>
<td>←</td>
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</tr>
<tr>
<td>12</td>
<td>→</td>
<td>RRC CONNECTION RELEASE COMPLETE</td>
<td></td>
</tr>
</tbody>
</table>
20.5.4 Routing Area Update; Rejected (#9 MS identity cannot be derived by the network)

Description
The UE successfully performs a Routing Area Update procedure after camping onto a serving cell with a different LAI and a P-TMSI which is unknown to the network.

Related 3GPP core specifications
3GPP TS 24.008 4.7.5.1.4 (Routing area updating procedure not accepted by the network)

Reason for test
To verify that the UE can successfully perform a Routing Area Update procedure after camping onto a serving cell with a different LAI and a P-TMSI which is unknown to the network.

Initial configuration
The UE is attached in packet mode.

P-TMSI unknown in network can be provoked by following scenarios:
- Changing PLMNs
- Using two identical (U)SIM cards which are registered in the network at the same time
- Alternatively: Change P-TMSI and LAI on the (U)SIM to a different but valid figure and then perform an GPRS Attach Procedure.

Test procedure
1. Move the UE from the initial cell into a cell with a different LAI till the UE performs a cell reselection.
2. The UE shall send a ROUTING AREA UPDATE REQUEST message to the network containing a P-TMSI which is not known by the network. Check whether the “update type” parameter holds the “RA updating” value.
3. Check that the Test UE deletes the stored RAI, GPRS-CKSN, P-TMSI and P-TMSI signature when it receives the Routing Area Update Reject message (GMM cause #9 ‘MS identity cannot be derived by the network’)
4. Check that the UE restarts the GPRS Attach procedure using its IMSI.
5. The network shall then send a ATTACH ACCEPT message to the UE. This message contains a new TMSI for the UE and the LAI for the new cell, which is acknowledged by the UE.
6. Check that the UE can establish a packet data connection after the GPRS Attach procedure.

Expected behaviour
The UE performs this ‘Routing Area Update’ procedure without coverage loss indication and is able to establish a packet data connection after the GPRS Attach procedure.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC CONNECTION REQUEST</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION SETUP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION SETUP COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>ROUTING AREA UPDATE REQUEST</td>
<td>update type = RA updating, mobile identity = P-TMSI 1 P-TMSI 1 signature Routing area identity = RAI 1</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>ROUTING AREA UPDATE REJECT</td>
<td>GMM cause #9 'MS identity cannot be derived by the network'</td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>ATTACH REQUEST</td>
<td>Attatch type = 'GPRS attach' Mobile identity = IMSI</td>
</tr>
<tr>
<td>7</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
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</tr>
<tr>
<td>9</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td></td>
</tr>
</tbody>
</table>
## 20.6 PLMN Selection for R99 devices

Most of the tests in this section require special field test UICCs where the content of the PLMN Selector $EF_{OPLMNwAct}$ are set by the operator as defined in the test. For Field Test UICCs Steering of Roaming (SoR) shall not be activated.

### 20.6.1 Automatic Mode, at power on

These network selection tests can be performed either as field tests (Procedure A) or on a System Simulator (Procedure B). It is preferable to run the tests more than once. Because of consistency, the initial conditions shall be restored if the same test is repeated.

#### 20.6.1.1 UE selects a prioritised network (PLMNsel List on the SIM (<=rel98))

**Description**

Verification that the UE correctly selects a designated and prioritised network.

**Remark:** The SIM shall be compliant to Rel-98 or earlier

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

The purpose of the test is to ensure that the UE is reading the data from $EF_{PLMNsel}$ on the SIM and uses it correctly.

**Initial conditions**

For dual mode W-CDMA / GSM devices two scenarios must be tested:

1) For the preferred network only GSM cells are available and at least one further network shall have a W-CDMA cell available.

2) For the preferred network both UMTS cells and GSM cells are available.

**Initial conditions for Procedure A**

The SIM card shall have a CS/PS enabled for roaming with access to all available networks.

UE is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

**Initial conditions for Procedure B**

A system simulator with at least 3 PLMNs is used.

A Prioritised Network BCCH (amongst other non-prioritised networks BCCH) is broadcasted.

A SIM (compliant to Rel-98 or earlier) with the same prioritised network located in the last entry of $EF_{PLMNsel}$

UE is switched off, in automatic network selection mode.

**Initial conditions for the SIM card (both Procedures)**

The SIM card shall support preferably 64 (but not less than 32) entries on the Preferred PLMN list.
Location Information (EF_LOC): FF FF FF FF FF FF FF FF FF FF FF 00 00 01
Forbidden PLMN (EF_FPLMN): FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
Broadcast Control Channels (EF_BCC): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PLMN Selector (EF_PLMNsel) MCC xxx / MNC yy on the last position, all other fields are filled with network codes corresponding to networks not available at the test location.
Note: xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.

Test procedure

The test can be performed in a live network or a system simulator. The reason for using a system simulator is simply that the network conditions (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The UE is powered up at a location, where not less than 3 networks are available with a field strength better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

Procedure B (Alternative test performed on a system simulator)

The UE is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

Expected behaviour

The UE shall select the prioritised network in the EF_PLMNsel and ignore non-prioritised PLMNs.

20.6.1.2 UE selects a prioritised network (User controlled PLMNwAcT List on the SIM/USIM (>=rel99))

Description

Verification that the UE correctly selects a designated and prioritised network.

Remarks: A UICC with SIM or a UICC (with SIM and USIM) is used for this test. In both cases the SIM shall contain EF_PLMNsel, EF_PLMNwACT and EF_OPLMNwACT-

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

The purpose of the test is to ensure that the UE is reading the data from EF_PLMNwACT on the (U)SIM and using it correctly.

Initial conditions

For dual mode W-CDMA / GSM devices the following initial condition applies:

For the preferred network both UMTS cells and GSM cells are available. At least one further network (Network C) shall have a GSM cell available.

Initial conditions for Procedure A

The SIM card shall be CS/PS enabled for roaming with access to all available networks.
UE is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

Initial conditions for Procedure B

A system simulator with at least 3 PLMNs is used.

A Prioritised Network BCCH (amongst other non-prioritised networks BCCH) is broadcasted.

Two UICCs (one with SIM only, one with both SIM and USIM) (compliant to Rel-99 or later) with the prioritised network located in the last entry of EFPLMNwAcT / EFOPLMNwAcT is required.

UE is switched off, in automatic network selection mode.

Initial conditions for the UICC (both Procedures)

The SIM card shall support preferably 64 (but not less than 32) entries on the EFPLMNsel and 50 (but not less than 32) entries on the EFPLMNwAcT and EFOPLMNwAcT.

| Location Information (EFLOC): | FF FF FF FF FF FF FF FF 00 00 00 01 |
| Forbidden PLMN (EFPLMN): | FF FF FF FF FF FF FF FF FF FF FF FF |
| Broadcast Control Channels (EFBCCH): | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
| PLMN Selector (EFPLMNwAcT) | The MCC xxx / MNC yy of the Preferred PLMN is put on the last position of the following PLMN Selector: |
| | 1) SIM only | EFPLMNwAcT |
| | 2) SIM and USIM | EFPLMNwAcT |
| OPLMN Selector (EFOPLMNwAcT) | Not relevant for this test. |
| PLMN Selector (EFPLMNsel) | The MCC/MNC of Network C shall be stored in EFPLMNsel. With this method it is tested that the UE ignores EFPLMNsel when EFPLMNwAcT or EFOPLMNwAcT is available. |

Test procedure

The test can be performed in a live network or optionally on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

Procedure B (Alternative test performed on a system simulator)

The UE is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the UE receives the signal strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.
Expected behaviour
The UE shall select the prioritised PLMN network and ignore the non-prioritised PLMNs.

20.6.1.3 UE selects a prioritised network (Operator controlled OPLMNWAct List on the SIM(>=rel99))

Description
Verification that the UE correctly selects a designated and prioritised network.

Remarks: A UICC with SIM or a UICC (with SIM and USIM) is used for this test. In both cases the SIM shall contain EF_{PLMNsel}, EF_{PLMNwACT} and EF_{OPLMNwACT}.

Related 3GPP/GSM core specifications
TS 23.122

Reason for test
The purpose of the test is to ensure that the UE is reading the data from EF_{OPLMNwACT} on the (U)SIM and uses it correctly.

Initial conditions
For dual mode W-CDMA / GSM devices the following initial condition applies:
For the preferred network both UMTS cells and GSM cells are available. At least one further network (Network C) shall have a GSM cell available.

Initial conditions for Procedure A
The SIM card shall CS/PS enabled for roaming with access to all available networks.
UE is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.

Initial conditions for Procedure B
A system simulator with at least 3 PLMNs is used.
A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.
Two UICCs (one with SIM only, one with both SIM and USIM) (compliant to Rel-99 or later) with the prioritised network located in the last entry of EF_{PLMNwACT} / EF_{OPLMNwACT} is required.
UE is switched off, in automatic network selection mode.

Initial conditions for the UICC (both Procedures)
The SIM card shall support preferably 64 (but not less than 32) entries on the EF_{PLMNsel} and 50 (but not less than 32) entries on the EF_{PLMNwACT} and EF_{OPLMNwACT}.

<table>
<thead>
<tr>
<th>Location Information (EF_{LOCI})</th>
<th>FF FF FF FF FF FF FF 00 00 00 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden PLMN (EF_{FPLMN})</td>
<td>FF FF FF FF FF FF FF FF FF FF FF FF</td>
</tr>
<tr>
<td>Broadcast Control Channels (EF_{BCCH})</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>PLMN Selector (EF_{PLMNwACT})</td>
<td>The MCC xxx / MNC yy of the Preferred PLMN and Network C must NOT be stored in EF_{PLMNwACT}</td>
</tr>
<tr>
<td>PLMN Selector (EF_{OPLMNwACT})</td>
<td>The test procedure shall be repeated for both UICCs.</td>
</tr>
</tbody>
</table>

The MCC xxx / MNC yy of the Preferred PLMN is placed on the last position of the following PLMN Selector:

<table>
<thead>
<tr>
<th>UICC</th>
<th>PLMN Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) SIM only</td>
<td>EF_{PLMNwACT}</td>
</tr>
<tr>
<td>2) SIM and USIM</td>
<td>EF_{OPLMNwACT}</td>
</tr>
</tbody>
</table>

All other fields are filled with network codes corresponding to networks not available at the test location.

Access Technology (2 bytes, set to 80 80)

Note: xxx and yy should be the MCC and MNC of one of the
Test procedure

The test can be performed in a live network or optionally on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

**Procedure B (Alternative test performed on a system simulator)**

The UE is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

**Expected behaviour**

The UE shall select the prioritised PLMN and ignore the non-prioritised PLMNs.

### 20.6.2 Network Re-Selection after regaining Coverage

#### 20.6.2.1 Automatic Network selection; without information on preferred PLMN list

**Description**

If in automatic network selection mode and without a preferred PLMN list and when the HPLMN or the last registered PLMN is not available, the UE shall randomly select a network with sufficient received signal level. These are networks with a received signal strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

**Remarks**

A SIM card, a UICC with SIM or a UICC (with SIM and USIM) is used for this test. In all cases the SIM or USIM shall contain EF\textsubscript{PLMNsel}, EF\textsubscript{PLMNwAcT} or EF\textsubscript{OPLMNwAcT} either with no entries or with PLMNs not present in the field.

**Related GSM core specifications**

TS 22.011, sub clause 3.2.2.2

**Reason for test**

To ensure that the automatic network selection procedure is correctly performed when roaming away from the HPLMN.

**Initial configuration**

UE switched off, in automatic selection mode. The EF\textsubscript{PLMNsel}, EF\textsubscript{PLMNwACT} or EF\textsubscript{OPLMNwACT} on the SIM or USIM shall not contain PLMNs present in the field. The HPLMN or the last registered PLMN is not available. The SIM/USIM shall have roaming subscription at least with CS access to all available networks. Before each test loop, the following data on the SIM card needs to be set to its default values:
Initial conditions for Procedure A (On a feasible location)

The test shall be carried out at a location, where not less than 3 networks are available with a field strength better than –85 dBm for GSM and a primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For UEs supporting GSM only, ensure that not less than 2 networks are available on GSM frequencies with a field strength better than –85 dBm. This can be proved using a reference device with a network monitor.

Initial conditions for Procedure B (Alternative test performed on a system simulator)

The configuration of the system simulator shall be that not less than 3 networks are provided. At least one GSM network with field strength better than -85 dBm and at least 2 UMTS networks with a primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For terminals supporting GSM only, the system simulator shall provide at least 2 networks on GSM frequencies with a field strength better than –85 dBm.

Test procedure

Procedure A

The UE is switched on and the selected network is noted. Afterwards the UE is switched off and the SIM is prepared for the next loop as stated above.

Procedure B

Before each test loop, the UE shall perform successfully a location updating procedure at the system simulator. The selected network is noted. Afterwards the UE is switched off and the SIM is prepared for the next loop as stated above.

As it is impossible to check the random balance by repeating the test a few times it will be checked that each available network is at least selected once. When this condition is reached the test loop can be stopped. The device fails the test when at least one network is not selected after repeating the test N times. The maximum number of repetitions N depends on the number of networks, i.e. different number of MCC/MNC combinations:

<table>
<thead>
<tr>
<th>No of MCC/MNC combinations</th>
<th>Maximum number of repetitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>n</td>
<td>(2/(\log_{10}(n)-\log_{10}(n-1)))</td>
</tr>
</tbody>
</table>

This table is based on the assumption that after reaching the maximum number of repetition a correctly implemented UE would have selected each network at least once with a probability of better than 99%.

Expected behaviour

After each procedure, the UE performs an automatic network selection. The network selection was performed in a random balance. When repeating the procedure N times (as defined above) the UE has selected each available network (with a field strength better than –85 dBm for GSM and a primary CPICH RSCP better than -95 dBm for UMTS-FDD) at least once.
20.6.2.2 UE re-selects a prioritised network after regaining coverage
(PLMNsel List on the SIM(<=rel98)

Description
Verification that the UE correctly selects a new prioritised network, after having lost the old VPLMN
due to loss of coverage.

Related 3GPP/GSM core specifications
TS 23.122

Reason for test
This test shall verify that the terminals network selection procedure conforms to the 3GPP Rel-99
Specification.

Initial configuration
For dual mode W-CDMA / GSM devices two scenarios must be tested:
1) For the preferred network VPLMN B only GSM cells are available and at least one further network
   shall have a W-CDMA cell available.
2) For the preferred network VPLMN B both UMTS cells and GSM cells are available.

Initial conditions for Procedure A
The SIM card shall CS/PS be enabled for roaming with access to all available networks.
UE is switched on, in automatic network selection mode, located outside the coverage area of the
HPLMN and camps on VPLMN A.

Initial conditions for Procedure B
A system simulator with at least 3 PLMNs is used.
A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.
A SIM (compliant to Rel-98 or earlier) with the same prioritised network located in the last entry of
EFPLMNsel.
UE is switched on, in automatic network selection mode and camps on the VPLMN A.

Initial conditions for the SIM card (both Procedures)
The SIM card shall support preferably 64 (but not less than 32) entries on the Preferred PLMN list.

| Forbidden PLMN (EFPLMN) | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around the coverage of VPLMN A gets lost (for all radio access technologies of this PLMN). The UE loses the network and searches for a new VPLMN. The location where VPLMN A is lost should be found within EF_HPLMN (Higher Priority PLMN search period) after switching on the phone, to prevent the device from searching for a higher prioritised network.

**Procedure B (Alternative test performed on a system simulator)**

The UE is powered up VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The signal level of VPLMN A is changed so the serving network is lost. The UE starts searching for a new VPLMN.

**Expected behaviour**

The UE shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.

**20.6.2.3 UE re-selects a prioritised network (User controlled PLMNwAcT List on the SIM/USIM(>=rel99))**

**Description**

Verification that the UE correctly selects a prioritised network, after having lost the old VPLMN due to loss of coverage.

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

This test shall verify that the network selection conforms to the 3GPP Rel-99 Specification.

**Initial configuration**

For dual mode W-CDMA / GSM devices the following initial condition applies:

For the preferred network VPLMN B both UMTS cells and GSM cells are available. At least one further network (PLMN D) shall have a GSM cell available.

**Initial conditions for Procedure A**

The SIM card shall CS/PS be enabled for roaming with access to all available networks.

UE is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN and camps on VPLMN A.

**Initial conditions for Procedure B**

A system simulator with at least 3 PLMNs is used.

A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.

Two UICC(s) (one with SIM only, one with both SIM and USIM) (compliant to Rel-99 or later) are required, with the prioritised networks VPLMN A and VPLMN B located in the last two entries of EF_PLMNwAcT / EF_OPLMNwAcT.

UE is switched on, in automatic network selection mode and camps on the VPLMN A.

**Initial conditions for the UICC (both Procedures)**

The SIM card shall support preferably 64 (but not less than 32) entries on the EF_PLMNsel and 50 (but not less than 32) entries on the EF_PLMNwAcT and EF_OPLMNwAcT.
Forbidden PLMN (EF_PLMN): FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

**PLMN Selector (EF_PLMNwAcT)**

The MCC / MNC of VPLMN A is stored on the last but one position. MCC /MNC of VPLMN B is stored on the last position:

<table>
<thead>
<tr>
<th>UICC</th>
<th>PLMN Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) SIM only</td>
<td>EF_PLMNwAcT</td>
</tr>
<tr>
<td>2) SIM and USIM</td>
<td>EF_PLMNwAcT</td>
</tr>
</tbody>
</table>

The test procedure shall be repeated for both UICCs.

All other fields in both EF_PLMNwAcT are filled with network codes corresponding to networks not available at the test location.

Access Technology (2 bytes, set to 80 80)

**OPLMN Selector (EF_OPLMNwAcT)**

Not relevant for this test.

**PLMN Selector (EF_PLMNsel)**

The MCC/MNC of Network D shall be stored in EF_PLMNsel. With this method it is tested that the UE ignores EF_PLMNsel when EF_PLMNwAcT or EF_OPLMNwAcT is available.

In addition to this the HPLMN Search Period Timer be set at least to 30 minutes (“05”)

UE has already successfully selected the prioritised network and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE was powered up at a location, where not less than 3 networks are available with a field strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN) so that the UE loses the network and is forced to search for a new network.

**Procedure B (Alternative test performed on a system simulator)**

The UE is powered up and VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The signal level of VPLMN A is changed so the serving network is lost. The UE starts searching for a new VPLMN.

**Expected behaviour**

The UE shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.
20.6.2.4 UE re-selects a prioritised network (Operator controlled OPLMNwAct List on the SIM(>=rel99))

Description
Verification that the UE correctly selects a prioritised network, after having lost the old VPLMN due to loss of coverage.

Related 3GPP/GSM core specifications
TS 23.122

Reason for test
This test shall verify that the network selection conforms to the Rel-99 Specification.

Initial configuration
For dual mode W-CDMA / GSM devices the following initial condition applies:
For the preferred network VPLMN B both UMTS cells and GSM cells are available. At least one further network (PLMN D) shall have a GSM cell available.

Initial conditions for Procedure A
The SIM card shall CS/PS be enabled for roaming with access to all available networks.
UE is switched on, in automatic network selection mode, located outside the coverage area of the HPLMN and camps on VPLMN.

Initial conditions for Procedure B
A system simulator with at least 3 PLMNs is used.
A Prioritised Network BCCH (amongst other non- prioritised networks BCCH) is broadcasted.
Two UICCs (one with SIM only, one with both SIM and USIM) (compliant to Rel-99 or later) are required, with the prioritised networks VPLMN A and VPLMN B located in the last two entries of EF-PLMNwAct / EFPLMNwAct.
UE is switched on, in automatic network selection mode and camps on the VPLMN A.

Initial conditions for the UICC (both Procedures)
The SIM card shall support preferably 64 (but not less than 32) entries on the EFPLMNsel and 50 (but not less than 32) entries on the EFPLMNwAcT and EFPLMNwAcT.

<table>
<thead>
<tr>
<th>Forbidden PLMN (EFPLMN)</th>
<th>FF FF FF FF FF FF FF FF</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN Selector (EFPLMNwAct)</td>
<td>The MCC / MNC of the Preferred PLMNs VPLMN A, VPLMN B and VPLMN D must NOT be stored in EFPLMNwAct.</td>
</tr>
<tr>
<td>PLMN Selector (EFPLMNwAcT)</td>
<td>The MCC / MNC of VPLMN A is stored on the last but one position. MCC /MNC of VPLMN B is stored on the last position:</td>
</tr>
<tr>
<td>UICC</td>
<td>PLMN Selector</td>
</tr>
<tr>
<td>1) SIM only</td>
<td>EFPLMNwAct</td>
</tr>
<tr>
<td>2) SIM and USIM</td>
<td>EFPLMNwAct</td>
</tr>
</tbody>
</table>

The test procedure shall be repeated for both UICCs.
All other fields in both EF-PLMNwAcT are filled with network codes corresponding to networks not available at the test location.
Access Technology (2 bytes, set to 80 80)

| PLMN Selector (EFPLMNsel) | The MCC/MNC of Network D shall be stored in EFPLMNsel. With this method it is tested that the UE ignores EFPLMNsel when EFPLMNwAct or EFPLMNwAcT is available. |

In addition to this the HPLMN Search Period Timer be set at least to 30 minutes ("05")
UE has already successfully selected the prioritised network and if left on, in automatic network selection mode.
Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

Procedure A (On a feasible location)

The UE was powered up at a location, where not less than 3 networks are available with a field strength for GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN) so that the UE loses the network and is forced to search for a new network.

Procedure B (Alternative test performed on a system simulator)

The UE is powered up and VPLMN A is selected.

The non-prioritised network(s) (excluding VPLMN A / VPLMN B) should transmit with a higher power than VPLMN B. All networks should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The signal level of VPLMN A is changed so the serving network gets lost. The UE starts searching for a new VPLMN.

Expected behaviour

The UE shall select the prioritised network VPLMN B and ignore the non-prioritised PLMNs.

20.6.3. Periodic HPLMN searching when in Roaming

20.6.3.1 UE re-selects a prioritised network. HPLMN Timer expires in a coverage area with no higher prioritised network coverage

Description

To identify the behaviour of the UE if the HPLMN Search Period Timer expires in an area were no prioritised network is available.

Related 3GPP/GSM core specifications

TS 23.122

Reason for test

This test shall verify that the network selection is conforms to Rel-99 Specification.

Initial configuration

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where:

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>PLMN Selector (EFPLMNsel)</th>
<th>The MCC / MNC of the Preferred PLMN is put on the last position of the PLMN Selector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the UICC</td>
<td>PLMN Selector (EFPLMNwAcT)</td>
<td>All other fields in all PLMN Selectors (EFPLMNsel, EFPLMNwAcT, EFOPLMNwAcT) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access Technology for EFPLMNwAcT and EFOPLMNwAcT (2 bytes, set to 80 80)</td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EFHPPLMN) be set to 6 minutes ("01")
UE has already successfully selected the prioritised network and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_HPPLMN) to ensure a PLMN background scan is activated.

**Procedure B (Alternative test performed on a system simulator)**

The UE is powered up.

The non-prioritised network(s) should transmit with a higher power than the prioritised network. The prioritised network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester shall wait HPLMN Search Period Timer (EF_HPPLMN) until PLMN background scan is activated.

**Expected behaviour**

It shall be checked that the device stays after expiry of HPLMN Search Period Timer (EF_HPPLMN) on the same VPLMN.

**20.6.3.2 UE re-selects a higher prioritised network when camping on a prioritised network**

**Description**

To identify the behaviour of the UE when it camps on a prioritised network and the HPLMN Search Period Timer (EF_HPPLMN) expires in an area were a higher prioritised network is available.

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

This test shall verify that the network selection conforms to the Rel-99 Specification.

**Initial configuration**

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where:

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>On the UICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN Selector (EF_PLMNsel)</td>
<td>PLMN Selector (EF_PLMNwAcT)</td>
</tr>
</tbody>
</table>

| The MCC / MNC of the Preferred VPLMN A and VPLMN B is put on the last two positions of the PLMN Selector. |
| All other fields in all PLMN Selectors (EF_PLMNwAcT, EF_OPLMNwAcT) are filled with network codes corresponding to networks not available at the test location. |
| Access Technology for EF_PLMNwAcT and EF_OPLMNwAcT (2 bytes, set to 80 80) |
For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_{HPLMN}) be set to 6 minutes ("01")

UE has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured).

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM. This can be proved using a reference UE with a network monitor mode.

While driving around the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device should select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_{HPLMN}) so that a PLMN background scan is activated.

**Procedure B (Alternative test performed on a system simulator)**

VPLMN B is the only available network. The UE is powered up and selects VPLMN B.

The radio conditions are changed so VPLMN A, VPLMN B and at least one non-prioritised network(s) is available. VPLMN B should transmit with a higher power than the other networks but all network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester shall wait HPLMN Search Period Timer (EF_{HPLMN}) until PLMN background scan is activated.

**Expected behaviour**

It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF_{HPLMN}).

**20.6.3.3 UE re-selects a higher prioritised network when camping on a non-prioritised network**

**Description**

To identify the behaviour of the UE when it camps on a non-prioritised network and the HPLMN Search Period Timer (EF_{HPLMN}) expires in an area were a higher prioritised network is available.

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

This test shall verify that the network selection conforms to the Rel-99 Specification.

**Initial configuration**

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where
On the SIM
- PLMN Selector (EF\textsubscript{PLMNsel})

On the UICC
- PLMN Selector (EF\textsubscript{PLMNwAcT})

| The MCC / MNC of the Preferred VPLMN A is put on the last position of the PLMN Selector. |
| All other fields in all PLMN Selectors (EF\textsubscript{PLMNsel}, EF\textsubscript{PLMNwAcT}, EF\textsubscript{OPLMNwAcT}) are filled with network codes corresponding to networks not available at the test location. |
| Access Technology for EF\textsubscript{PLMNwAcT} and EF\textsubscript{OPLMNwAcT} (2 bytes, set to 80 80) |

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) be set to 6 minutes ("01").

UE has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

Test procedure

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select a non-prioritised VPLMN.

One drives to a location where both, VPLMN A and the non-prioritised VPLMN are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) so ensure a PLMN background scan is activated.

**Procedure B (Alternative test performed on a system simulator)**

A non-prioritised VPLMN is the only available network. The UE is powered up and selects this VPLMN.

The radio conditions are changed so VPLMN A and at least two non-prioritised network(s) is available. The VPLMN the device camps on should transmit with a higher power than the other networks but all network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester shall wait HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) until PLMN background scan is activated.

**Expected behaviour**

It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF\textsubscript{HPPLMN}).

**20.6.3.4 UE re-selects a prioritised network - Different Values of the HPLMN Timer / No HPLMN Search timer defined**

**Description**

Verification that the UE re-selects a prioritised network according to the HPLMN timer.
Related 3GPP/GSM core specifications
TS 23.122

Reason for test
Different values for the HPLMN timer should not have an effect on the re-selection procedure. A default value shall be taken if no HPLMN Search Timer available.

Initial configuration
The following three cards are required:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Each of these three cards shall have one of the following different values for the HPLMN Search Timer:

- 30 minutes
- 18 minutes
- HPLMN Search Timer not available (default value 60 minutes apply)

Test procedure

Scenario A:
Test executed as defined below with defined value 30 min

Scenario B:
Test executed as defined below with defined value 18 min

Scenario C:
Test executed as defined below with No HPLMN defined

For each of the above scenarios the following test shall be performed:

Procedure A (On a feasible location)
The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select a non-prioritised VPLMN.

One drives to a location where both, VPLMN A and the non-prioritised VPLMN are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) so ensure a PLMN background scan is activated.

Procedure B (Alternative test performed on a system simulator)
A non-prioritised VPLMN is the only available network. The UE is powered up and selects this VPLMN.

The radio conditions are changed so VPLMN A and at least two non-prioritised network(s) is available. The VPLMN the device camps on should transmit with a higher power than the other networks but all network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester shall wait HPLMN Search Period Timer (EF\textsubscript{HPPLMN}) until PLMN background scan is activated.
Expected behaviour
It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF_HPLMN).

20.6.3.5 HPLMN Timer expires during an on-going Voice call

Description
Verification that the UE re-selects a higher priority network after call release if the HPLMN timer expires during an on-going voice call.

Related GSM core specifications
TS 23.122

Reason for test
The network re-selection shall be performed after the voice call has been terminated.

Initial configuration
A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>The MCC / MNC of the Preferred VPLMN A and VPLMN B are stored in the last two positions of the PLMN Selector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the UICC</td>
<td>All other fields in all PLMN Selectors (EF PLMNsel, EF PLMNwAcT, EF_OPLMNwAcT) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology for EF PLMNwAcT and EF OPLMNwAcT (2 bytes, set to 80 80)</td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_HPLMN) be set to 6 minutes ("01").

UE has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

Test procedure
The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

Procedure A (On a feasible location)
The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.

The tester start a voice call and waits until HPLMN Search Period Timer (EF_HPLMN) is expired. Afterwards the call is released.

Procedure B (Alternative test performed on a system simulator)
VPLMN B is the only available network. The UE is powered up and selects VPLMN B.

The radio conditions are changed so VPLMN A, VPLMN B and at least one non-prioritised network(s) is available. VPLMN B should transmit with a higher power than
the other networks but all network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester start a voice call and waits until HPLMN Search Period Timer (EF_HPPLMN) is expired. Afterwards the call is released.

**Expected behaviour**

It shall be checked that the voice call is active while HPLMN Search Period Timer (EF_HPPLMN) expired. After releasing the call the UE shall re-select the higher priority PLMN A.

### 20.6.3.6 HPLMN Timer expires during an on-going data connection (GPRS)

**Description**

Verification that the UE re-selects a higher priority network after releasing a PDP context if the HPLMN timer expires during an on-going packet connection.

**Related 3GPP/GSM core specifications**

TS 23.122

**Reason for test**

The network re-selection shall be performed after the PDP context has been disconnected.

**Initial configuration**

A SIM or UICC (with SIM only or with both SIM and USIM) shall be used for this test where

<table>
<thead>
<tr>
<th>On the SIM</th>
<th>On the UICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PLMN Selector (EF_PLMNsel)</td>
<td>The MCC / MNC of the Preferred VPLMN A and VPLMN B shall be stored in the last two positions of the PLMN Selector.</td>
</tr>
<tr>
<td>• PLMN Selector (EF_PLMNwAcT)</td>
<td>All other fields in all PLMN Selectors (EF_PLMNsel, EF_PLMNwAcT, EF_OPLMNwAcT) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology for EF_PLMNwAcT and EF_OPLMNwAcT (2 bytes, set to 80 80)</td>
</tr>
</tbody>
</table>

For this test a special SIM or UICC (with SIM only or with both SIM and USIM) is recommended. For this card the HPLMN Search Period Timer (EF_HPPLMN) be set to 6 minutes (“01”) UE has already successfully selected the prioritised network VPLMN A and if left on, in automatic network selection mode.

**Test procedure**

The test can be performed in a live network or on a system simulator. The reason for using a system simulator is simply that the network condition (i.e. received signal strength of the BCCH by the UE) can be configured easily and the conditions seen by the mobile can be assured.

Either procedure A or B needs to be tested

**Procedure A (On a feasible location)**

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm or primary CPICH RSCP better than -95 dBm for UMTS-FDD.

For devices supporting GSM only, ensure that not less than 2 GSM networks are available with a field strength for GSM better than –85 dBm. This can be proved using a reference UE with a network monitor mode.

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.
The tester activates a PDP context and starts data transfer. The HPLMN Search Period Timer (EF_{HPPLMN}) expires during data transfer. Afterwards the PDP context is deactivated.

**Procedure B (Alternative test performed on a system simulator)**

VPLMN B is the only available network. The UE is powered up and selects VPLMN B.

The radio conditions are changed so VPLMN A, VPLMN B and at least one non-prioritised network(s) is available. VPLMN B should transmit with a higher power than the other networks but all network should transmit in such a way, that the UE would receive the signal strength for GSM better than –85 dBm and primary CPICH RSCP better than -95 dBm for UMTS-FDD.

The tester activates a PDP context and starts data transfer. The HPLMN Search Period Timer (EF_{HPPLMN}) expires during data transfer. Afterwards the PDP context is deactivated.

**Expected behaviour**

It shall be checked that the data transfer is on-going while HPLMN Search Period Timer (EF_{HPPLMN}) expires and that the PDP context is still active after expiry of the HPLMN Search Period Timer. After deactivation of the PDP context the UE shall re-select the higher priority PLMN A.

### 20.6.4 Manual Mode

**Description**

If in manual network selection mode, the UE shall list all available PLMNs. This behaviour is independent from the content of the preferred PLMN list.

**Related GSM core specifications**

TS 22.011, sub clause 3.2.2.2

**Reason for test**

To ensure that the correct list of PLMNs is displayed for the purposes of manual PLMN selection.

**Initial configuration**

UE switched on, in automatic selection mode in an area with coverage from both GSM and UMTS networks.

**Test procedure**

1. Select the manual network selection mode on the UE and ensure that the list of all available PLMNs is displayed, and that the displayed networks can be selected, even if on the forbidden list.
2. Check that the preferred PLMN list is not changed after the manual network selection.
3. Repeat the test with different entries in the preferred PLMN lists, including the empty list and lists of more than 32 entries.

**Expected behaviour**

The UE shall display all available PLMNs and it shall perform manual network selection on the chosen network. The preferred PLMN list is not changed after the manual network selection.

The UE shall display all available GSM and UMTS networks.

### 20.6.5 Selection mode following switch off

**Description**

The UE shall retain its configuration of automatic and manual network selection modes when switched off.

**Related GSM core specifications**

TS 22.011, sub clause 3.2.2.2
Reason for test
To ensure that the UE retains its configuration of manual and automatic selection modes when switched off.

Initial configuration
UE in idle mode, with automatic network selection mode configured.

Test procedure
1. Change to manual network selection. Turn the UE off and on again. Check that the manual network selection mode is in use.
2. Change to automatic network selection. Turn the UE off and on again. Check that the automatic network selection mode is in use.

Expected behaviour
The UE has the same selection mode when switched on that it had when switched off.

20.6.6 Reception of System Info Type 5bis on non-supported UMTS Band

Description
Verification that the UE is able to select any Radio Access Technology (RAT) after receiving SIB Type 5bis on a non-supported UMTS band due to overlap of downlink channels. The test is performed with both, Release 6 devices supporting SIB Type 5bis and prior Release 6 devices where reception causes a decoding error.

Related core specifications and references
TS 25.331, Tdoc R2-072540, Tdoc R2-080035

Reason for test
In automatic network selection mode the device may receive SIB Type 5bis on a non-supported UMTS band due to overlap of downlink channels. Either 3GPP release 6 SIB Type 5bis will be successfully decoded (when supported) or reception causes a decoding error (when not supported). The test ensures that in both cases the device ignores the non-supported UMTS band and continues to search for any supported RAT.

Initial configuration
The test is performed in an environment which supports the following condition:

- A Radio Access Technology which is supported by the Device under Test (DUT).
- A Radio Access Technology which broadcasts SIB Type 5bis and where the corresponding downlink band is supported by the DUT, but not the uplink band. This can be one of the following combinations:

<table>
<thead>
<tr>
<th>Combination</th>
<th>Network / Simulator</th>
<th>DUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>UMTS Band IV</td>
<td>UMTS Band I</td>
</tr>
<tr>
<td></td>
<td>UL: 1710-1755 MHz</td>
<td>UL: 1920-1980 MHz</td>
</tr>
<tr>
<td></td>
<td>DL: 2110-2155 MHz</td>
<td>DL: 2110-2170 MHz</td>
</tr>
<tr>
<td>#2</td>
<td>UMTS Band X</td>
<td>UMTS Band I</td>
</tr>
<tr>
<td></td>
<td>UL: 1710-1770 MHz</td>
<td>UL: 1920-1980 MHz</td>
</tr>
<tr>
<td></td>
<td>DL: 2110-2170 MHz</td>
<td>DL: 2110-2170 MHz</td>
</tr>
<tr>
<td>#3</td>
<td>UMTS Band IX</td>
<td>UMTS Band III</td>
</tr>
<tr>
<td></td>
<td>UL: 1749.9-1784.9 MHz</td>
<td>UL: 1710-1785 MHz</td>
</tr>
<tr>
<td></td>
<td>DL: 1844.9-1879.9 MHz</td>
<td>DL: 1805-1880 MHz</td>
</tr>
</tbody>
</table>

Further a simple Simulator (or a corresponding test bed environment) is required where the DUT can successfully attach on the UMTS Band I or III, depending on the combination listed above.

A second device, e.g. a mobile phone, is required.
Test procedure
1. Depending on the device’s and the network’s configuration a test combination #1, #2 or #3 is selected. The SIM used for step 2 is connected to the device. The DUT is connected to a simulator (or a corresponding test bed environment) where the UMTS Band I or III, depending on the selected test combination is enabled. The device is switched on and switched off after location update. This step enables that the device may start searching in step 2 on the same band and technology as before switch off.

2. The DUT is switched on in the life network or a System Simulator which supports the RATs as listed under initial configuration.

3. A mobile originated call is performed to any destination.

Expected behaviour
1. The device performs a successful location update.
2. The device ignores the non-supported UMTS band (IV, X or IX) and finds a Radio Access Technology which is supported.
3. The mobile terminated call is successfully performed.

20.7 Security Mode (Integrity and Ciphering)

20.7.1 Authentication

20.7.1.1 IMSI Attach (incl. Security Mode Command)

Description
Procedure for testing support of the AUTHENTICATE command on the USIM

Related 3GPP core specifications
3GPP TS 31.102

Reason for test
To ensure that a UE supports authentication and ciphering during IMSI attach in 3G network correctly.

Initial configuration
The USIM has to support the elementary file EFKeys (Ciphering and Integrity Keys)
The PIN is enabled on the USIM.

This test requires either a trace UE or the possibility to log the signalling on the network side (e.g. Iub)
This test requires that the attach flag (ATT) is broadcast in the L3-RRC SYSTEM INFORMATION BLOCK 1 message.

Test procedure
1. The UE is switched on.
2. PIN is entered correctly.

Expected behaviour
1. The UE prompts for PIN.
2. PIN is accepted. The UE displays service in the network.

The signalling is checked in the log file. The UMTS authentication challenge is performed successfully:

<table>
<thead>
<tr>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE - NW</td>
<td>RRC (Connection Request)</td>
<td>RRC</td>
</tr>
<tr>
<td></td>
<td>RRC (Connection Setup)</td>
<td>RRC</td>
</tr>
<tr>
<td></td>
<td>RRC (Connection Setup Complete)</td>
<td>RRC</td>
</tr>
</tbody>
</table>
### 20.7.1.2 Mobile Originated Speech Call

**Description**

The UE responds shall correctly respond to an authentication request by the network when a MO call is established.

**Related 3GPP core specifications**

3GPP TS 24.008 Clause 4.3.2

**Reason for test**

To verify that the UE responds correctly responds to an authentication request by the network when a MO call is established.

**Initial configuration**

The USIM has to support the elementary file EFKeys (Ciphering and Integrity Keys)

This test requires either a trace UE or the possibility to log the signalling on the network side (e.g. Iub)

The UE is IMSI Attached using a USIM.

**Test procedure**

1. Initiate a mobile originated speech call from the UE to a PSTN phone.
2. Verify that the UE sends a CM SERVICE REQUEST Message to the Network.
3. The Network will then send an AUTHENTICATION REQUEST message.
4. Check that the UE responds with an AUTHENTICATION ACCEPT message.
5. Check that the UE will then send a SETUP message to the Network and complete the call.
6. Repeat Steps 1. – 5. with a SIM

**Expected behaviour**

The call is setup correctly.
20.7.1.3 GPRS Attach

Description
The UE shall correctly respond to an authentication request by the network on GPRS Attach.

Related 3GPP core specifications
3GPP TS 24.008 Clause 4.3.2

Reason for test
To verify that a UE correctly responds to an authentication request by the network on GPRS Attach.

Initial configuration
The USIM has to support the elementary file EFKeys (Ciphering and Integrity Keys)

This test requires either a trace UE or the possibility to log the signalling on the network side (e.g. Iub)
The UE is powered on and idle updated using an USIM.

Test procedure
1. Initiate the UE under test to perform the PS attach procedure using the UI menu or AT commands.
2. Verify that the UE sends an ATTACH REQUEST to the network.
3. The network will then send an AUTHENTICATION and CIPHERING REQUEST message.
4. Verify that the UE responds with an AUTHENTICATION and CIPHERING RESPONSE message.
5. The network will then send a LOCATION UPDATE ACCEPT message.
6. Repeat steps 1. – 5 with a SIM

Expected behaviour
The UE is correctly GPRS attached.

20.7.1.4 Primary PDP context activation

Description
The UE shall correctly respond to an authentication request by the network when a Primary PDP Context is activated.

Related 3GPP core specifications
3GPP TS 24.008 Clause 4.3.2

Reason for test
To verify that the UE correctly responds to an authentication request by the network when a Primary PDP Context is activated.

Initial configuration
The USIM has to support the elementary file EFKeys (Ciphering and Integrity Keys)

This test requires either a trace UE or the possibility to log the signalling on the network side (e.g. Iub)
The UE is powered on and idle updated using an USIM.

Test procedure
1. Initiate an externally initiated packet data session using any GPRS bearer supported by the UE. Verify that the UE sends a SERVICE REQUEST to the network.
2. The network will send an AUTHENTICATION and CIPHERING RESPONSE REQUEST to the UE.
3. Verify that the UE responds with a AUTHENTICATION and CIPHERING RESPONSE.
4. Verify that the UE then sends an ACTIVATE PDP CONTEXT REQUEST to the network.
5. Verify that the network responds with an ACTIVATE PDP CONTEXT ACCEPT and that the externally initiated packet data session is established.
6. Repeat steps 1. – 5. with a SIM

**Expected behaviour**
The UE has correctly established the GPRS connection.

### 20.7.2 Security Mode Command in Signalling Connection Establish Request (CS/PS)

**Description**
The UE shall correctly respond to a Security Mode Command Message.

**Related 3GPP core specifications**
3GPP TS 25.331

**Reason for test**
To verify that a UE correctly responds to a Security Mode Command Message.

**Initial configuration**
The UE is powered off.

This test requires either a trace UE or the possibility to log the signalling on the network side (e.g. Iub)

**Test procedure**
1. Power the UE on.
2. Examine and take note of the Security Capability (Ciphering and Integrity) Elements of the UE (as stated in the RRC Connection SETUP Complete Message).
3. On reception of a Layer 3 message (Location Update, Routing Area Update or, CM Service Request) from the UE, the network will respond with a Security Mode Command message containing the following information:
   - securityCapability
     - cipheringAlgorithmCap { uea1, uea0 },
     - integrityProtectionAlgorithmCap { uia1 }
   - cipheringModeInfo
     - cipheringModeCommand
     - startRestart: uea1
   - integrityProtectionModeInfo
     - IntegrityProtectionModeCommand startIntegrityProtection :
     - integrityProtInitNumber (this is a variable)
     - integrityProtectionAlgorithm uia1
   - cn-DomainIdentity (this is a variable)
   - ue-SystemSpecificSecurityCap
     - gsm:
       - gsmSecurityCapability (variants of a-5 algorithm supported by the UE)
4. The Security Capabilities sent by the network should correspond to the capabilities sent by the UE in the RRC Connection Setup Complete message.
5. Check that the UE establishes the service.

**Expected behaviour**
The UE is successfully establishing the service in Security Mode.
20.8 Equivalent PLMN functionality

NOTE: Complete tests covering the following subjects will be added at a later date. The headlines provided below are for guidance and shall create motivation for voluntary contributions.

20.8.1 Storage of ePLMNs

20.8.1.1 Reception of PLMN and ePLMN identities in SIB 3, 4 and 18
[Test to be defined]

20.8.1.2 LOCATION UPDATING ACCEPT
[Test to be defined]

20.8.1.3 ATTACH ACCEPT
[Test to be defined]

20.8.1.4 ROUTING AREA UPDATE ACCEPT
[Test to be defined]

20.8.2 Deletion of stored ePLMN in the UE
[Test to be defined]

20.8.2.1 LOCATION UPDATING ACCEPT
[Test to be defined]

20.8.2.2 ATTACH ACCEPT
[Test to be defined]

20.8.2.3 ROUTING AREA UPDATE ACCEPT
[Test to be defined]

20.8.3 Use of stored ePLMN in the UE

20.8.3.1 On switch on
[Test to be defined]

20.8.3.2 Preservation of stored ePLMN list upon removal of SIM
[Test to be defined]

20.8.3.3 When the ePLMN list is full
[Test to be defined]

20.8.3.4 Automatic mode

20.8.3.4.1 Across different ePLMNs with MS in different states
[Test to be defined]

20.8.3.4.2 From ePLMN to non-ePLMN with MS in different states
[Test to be defined]
20.8.3.4.3 From non-ePLMN to ePLMN with MS in different states
[Test to be defined]

20.8.3.4.4 Timer rescan of higher priority ePLMNs
[Test to be defined]

20.8.3.4.5 Return to HPLMN from ePLMN
[Test to be defined]

20.8.3.4.6 Support of MM/ GMM reject cause #15
[Test to be defined]

20.8.3.5 Manual mode

20.8.3.5.1 Across different ePLMNs with MS in PMM Connected state
[Test to be defined]

20.8.3.5.2 Across different ePLMNs with MS in PMM Idle state
[Test to be defined]

20.8.3.5.3 Across different ePLMNs with MS in MM Standby state
[Test to be defined]

20.8.3.5.4 Across different ePLMNs with MS in MM Ready state
[Test to be defined]

20.8.3.5.5 Selection of non-ePLMN
[Test to be defined]

20.8.4 Removal of Forbidden ePLMN list

20.8.4.1 LOCATION UPDATING ACCEPT
[Test to be defined]

20.8.4.2 ATTACH ACCEPT
[Test to be defined]

20.8.4.3 ROUTING AREA UPDATE ACCEPT
[Test to be defined]

20.8.5 Display of PLMN Network Name and Operator PLMN List

20.8.5.1 Support of the display of PLMN Network Name
Description
Procedure for correct display of PLMN Network Name stored in the USIM
Related 3GPP core specifications
3GPP TS 31.102
Reason for test
To ensure that the UE correctly displays the PLMN Network Name stored in the elementary file EF\textsubscript{PNN} (PLMN Network Name).

Initial configuration
The USIM has to support the following elementary files:

- EF\textsubscript{PNN} (PLMN Network Name)

One telephone subscriptions with the telephone number <MSISDN #1> is required to send and receive calls.

For this tests USIMs with the following different EF\textsubscript{PNN} values are needed:

a) <PLMN Network Name> coded as 7 bit coded value, unused bytes shall be set to ‘FF’.

b) <PLMN Network Name> coded as UCS2 coded value, unused bytes shall be set to ‘FF’.

Test procedure
With both USIM the following test procedures are performed.

1) The USIM is connected with the ME. The UE is switched on.

2) A mobile originated call to <MSISDN #1> is performed. The call is accepted by <MSISDN #1> and released afterwards.

3) A mobile terminated call from <MSISDN #1> is performed. The call is accepted by the UE and released afterwards.

Expected behaviour

1) The UE performs a location update and displays network name. Depending on the USIM used the following is presented on the display:

   a) The UE displays <PLMN Network Name> correctly.

   b) The UE displays the UCS2 coded <PLMN Network Name> correctly.

2) After release of the call the UE shall display the PLMN network name as listed in step 1).

### 20.8.5.2 Support of the display of Operator PLMN List in the USIM

Description
Procedure for correct display of PLMN Network Name and Operator PLMN List stored in the USIM

Related 3GPP core specifications

3GPP TS 31.102

Reason for test
To ensure that the UE correctly displays the PLMN Network Name and the Operator PLMN List stored in the elementary file EF\textsubscript{PNN} (PLMN Network Name) and EF\textsubscript{OPL} (Operator PLMN List).

Initial configuration
The USIM has to support the following elementary files:

- EF\textsubscript{PNN} (PLMN Network Name)

- EF\textsubscript{OPL} (Operator PLMN List)

One telephone subscriptions with the telephone number <MSISDN #1> is required to send and receive calls.

For this tests USIM with the following different EF\textsubscript{PNN} and EF\textsubscript{OPL} values are needed:

a) PNN: Register 1: <PLMN Network Name1> coded as 7 bit coded value, unused bytes shall be set to ‘FF’. Register 2: <PLMN Network Name2> coded as UCS2 coded value, unused bytes shall be set to ‘FF’.
b) OPL: Register 1: <Location Area Identity>, PNN Identifier = '01'. Register 2: <Location Area Identity>, PNN Identifier = '02'.

Test procedure
With both USIM the following test procedures are performed.
1) The USIM is connected with the ME. The UE is switched on.
2) A mobile originated call to <MSISDN #1> is performed. The call is accepted by <MSISDN #1> and released afterwards.
3) A mobile terminated call from <MSISDN #1> is performed. The call is accepted by the UE and released afterwards.

Expected behaviour
1) The UE performs a location update and displays network name. Depending on the Location Area the following is presented on the display:
   a) The UE displays <PLMN Network Name1> correctly.
   b) The UE displays the UCS2 coded <PLMN Network Name2> correctly.
2) After release of the call the UE shall display the PLMN network name as listed in step 1).

20.8.5.3 Priority of display of PLMN Network Name and Operator PLMN List over MM/GMM Information message (NITZ)

[Test to be defined]

20.9 W-CDMA Cell Selection Criteria Tests

20.9.1 W-CDMA Test for “Srxlev” Cell Selection Criteria
Description
The 3GPP specifications state that a Terminal shall only remain connected to a W-CDMA cell when the cell selection criterion “S” is fulfilled. 3GPP TS 25.304 defines that W-CDMA cells should only be selected when Srxlev > 0 and Squal > 0. Where Srxlev = Qrxlevmeas – Qrxlevmin – Pcompensation.

Related W-CDMA core specifications
3GPP TS 25.304

Reason for test
Terminals that do not adhere to these requirements will yield a poor user experience. For example:

- Some Terminals remain steadfastly camped to a network when the cell selection criterion falls below minimum levels. In this state these Terminals are unable to actually connect to the network resulting in a bad experience for the user (i.e. they indicate that they are ‘in service’ but are unable to make / receive calls).
- Some Terminals detach from the network before the cell selection criterion fall below minimum levels. In the field this behaviour results in either the Terminal selecting an alternative 2G network when there is adequate 3G coverage or, in the worst case, the Terminal loosing network coverage altogether.

Initial configuration
This test is to be undertaken under lab conditions using a simulated network environment.
The test requires the Terminal to support an Engineering Test Mode Display (or other mechanism) to report CPICH_RSCP to the tester.
The Terminal under test shall be enclosed in a RF shielded box or Anechoic Chamber.

Test procedure
1) Connect the Terminal to a simulated W-CDMA network (e.g. a W-CDMA system simulator or other such test equipment) via use of an RF cable.
2) Channel conditions shall initially set up with received CPICH_RSCP = -95 dBm and CPICH_EcIo = 0 dB. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1 of 3GPP TS34.121. Ensure that RSCP_EcIo remains > -5 dB throughout the test.
3) Set Qrxlevmin to = -115 dBm and Qqualmin to -18 dB on the simulated network.
4) Switch on the phone and wait for the Terminal to register to the simulated network and enter into RRC idle state.
5) Check the value of CPICH_RSCP reported by the Terminal via its Engineering Test Mode Display. Any delta between the reported CPICH_RSCP and the actual CPICH_RSCP shall hereby referenced to as ‘ø’ and shall be noted by the tester.
6) Set CPICH_RSCP on the simulated network to -114.2+ø dBm if the Terminal is power class 3 or -111.2+ø dBm if the Terminal is power class 4 (we consider 0.8 dB as test measurement tolerance).

Expected behaviour
1) If the Terminal is out of coverage the test is failed.

ELSE, if the Terminal is in service:
2) Perform a mobile terminated voice call (from the test equipment) if the voice call fails then the test is failed.

ELSE, if the voice call is successful:
3) Set CPICH_RSCP on the simulated network to -115.8+ø dBm if the Terminal is power class 3 or -112.8+ø dBm if the Terminal is power class 4 (0.8 dB as test measurement tolerance). If the Terminal is still in service, then the test is failed.

ELSE, if the Terminal is out of service:
4) The test is passed.

29.9.2 W-CDMA Test for “Squal” Cell Selection Criteria

Description
The 3GPP specifications state that a Terminal shall only remain connected to a W-CDMA cell when the cell selection criterion “S” is fulfilled. 3GPP TS 25.304 defines that W-CDMA FDD cells should only be selected when Srxlev > 0 and Squal > 0. Where: Squal = Qqualmeas – Qqualmin.

Related W-CDMA core specifications
3GPP TS 25.304

Reason for test
Terminals that do not adhere to these requirements will yield a poor user experience. For example:

- Some Terminals remain steadfastly camped to a network when the cell selection criterion falls below minimum levels. In this state these Terminals are unable to actually connect to the network resulting in a bad experience for the user (i.e. they indicate that they are ‘in service’ but are unable to make / receive calls).

- Some Terminals detach from the network before the cell selection criterion fall below minimum levels. In the field this behaviour results in either the Terminal selecting an alternative 2G network when there is adequate 3G coverage or, in the worst case, the Terminal loosing network coverage altogether.

Initial configuration
This test is to be undertaken under lab conditions using a simulated network.

The test requires the Terminal to support an Engineering Test Mode Display (or other such mechanism) to report CPICH_EcIo to the tester.

The Terminal under test shall be enclosed in a RF shielded box or Anechoic Chamber.
**Test procedure**

1) Connect the Terminal to a simulated W-CDMA network (e.g. a W-CDMA system simulator or other such test equipment) via use of an RF cable.

2) Channel conditions are initially set up with received CPICH_RSCP = -95 dBm and CPICH_EcIo = 0 dB. The relative power level of downlink physical channels to Ior are set up according to clause E.2.1 of 3GPP TS34.121.

3) Set Qrxlevmin to -115 dBm and Qqualmin to = -18 dB on the simulated network.

4) Switch on the phone and wait for the Terminal to register to the simulated network and enter into RRC idle state.

5) Lower the CPICH_EcIo of the simulated network until the Terminal's Engineering Test Mode Display reports a CPICH_EcIo value of -17 dB.

**Expected behaviour**

1) If the Terminal is out of coverage the test is failed.

2) Perform a mobile terminated voice call (from the test equipment) if the voice call fails then the test is failed.

3) Set lower the CPICH_EcIo of the simulated network to -19 dB. If the Terminal is still in service, then the test is failed.

4) The test is passed.

---

21 Physical Radio Layer FDD

21.1 Power Control

*Note:* To perform the following tests, some kind of tracing tool is needed by the tester in order to check the signalling exchange between UE and UTRAN. The purpose is to ensure that the power transmitted by the UE is raised or lowered as ordered by the UTRAN as needed.

Power control is an important feature to be tested, as this kind of misbehaviour produces excessive interference which reduces the total system capacity.

21.1.1 Open loop power control

21.1.1.1 Open loop power control to PRACH

*Description*

Verification that the UE calculates and applies the correct power for the first preamble when user tries to establish a dedicated channel.

*Related 3GPP core specifications*

TS 25.331 (section 8.5.7), TS 25.214 (section 5.1.1).

*Reason for test*

To ensure that the UE is not transmitting more power than specified, hence does not harm the cell capacity.

*Initial configuration*

UE in idle mode or Cell_PCH state.
Test procedure

Make a voice call.

Using a tracing tool, ensure that the power with which the preamble is transmitted is appropriate and if UE does not receive acknowledge from the UTRAN, check the preamble power is increased by one step (the operator should inform of the step size, and that should correspond to the measured increase) until the UE receives the acknowledge through AICH channel (channel assignment).

Expected behaviour

The UE initiates the communication correctly. The power with which the preambles are transmitted is not in excess of the specified and “power ramping” is well performed by the UE.

21.1.1.2 Open loop power control upon establishment of DPCCH

Description

Verification that the UE uses the UL open loop power control at the beginning of the DPCH transmission.

Related 3GPP core specifications

TS 25.331 (section 8.5.3), TS 25.214 (section 5.1.2).

Reason for test

To ensure that in the first stages of the dedicated channel establishment, the power is controlled in open loop until it is started to be controlled in closed loop. Ensure UE is not overpowered.

Initial configuration

UE establishing a DPCH.

Test procedure

Check the power with which DPCH channel is transmitted just after being established (being still in open loop power control). Repeat procedure in areas closer and farther from the Node B. Represent the power with which DPCH is transmitted in function of distance from Node B in a plot.

Expected behaviour

The UE transmits more power when it is farther from the Node B and less power when it is closer from it. The communication is successfully initiated in all cases.

21.1.2 Closed loop power control

21.1.2.1 Algorithm 1 for processing TPC commands

Description

Verification that UE performs correctly closed power control using “algorithm1”, including soft handover situations.

Related 3GPP core specifications

TS 25.214 (section 5.1.2.2.2).

Reason for test

To ensure that when the UE is in Cell-DCH state, it is following Transmit Power Control commands.

Initial configuration

UE engaged in a voice call. (Cell-DCH)

Test procedure

The test shall be performed in an area where operator ensures algorithm1 is used by the network. Follow a route, e.g. a road, along which soft handover can be performed (this information shall be provided by the network operator).
Move away from Node B “1”, and check that transmission power is increasing at a certain rate (some dBs per Kilometre). When the UE enters in the area of soft handover, check transmission power does not increase as fast as before: it increases more slowly, or keeps constant or even decreases. Check that, once out of the soft handover area, as we move closer to the Node B “2”, the transmission power is decreasing.

Represent the power with which DPCH is transmitted in function of distance from Node B in a plot.

It would be good if TPC commands received from the network and “TPC_cmd” generated by the UE could be logged: this way the fact that power is increased/decreased as requested by the network could be checked with more confidence.

**Expected behaviour**

UE correctly performs closed loop power control using “algorithm 1” and does not transmit more power than needed. The transmitted power log graph should be quite noisy with “algorithm 1”, as the transmitted power changes at every slot. There should be no horizontal segments in the graph, as from one slot to the next, the transmitted power is always changed, either raised or lowered, but never kept constant.

In the handover process, the expected behaviour is:

The received power at the "old" Node B gets weaker, while the received power at the "new" Node B gets stronger. UE transmit power should be determined by the strongest Node B at any time, i.e. the UE does not increase the transmit power as long as at least one Node B is satisfied (sends TPC down commands).

### 21.2 Transmit Diversity

#### 21.2.1 Time Switched Transmit Diversity (TSTD)

**Description**

Verification that UE performs correctly TSTD for SCH.

**Related 3GPP core specifications**

TS 25.211 (section 5.3.3.5.1).

**Reason for test**

To ensure UE supports TSTD.

**Initial configuration**

UE is switched off.

**Test procedure**

This test shall be done in an urban scenario where the signal received by the UE from one of the antennas of Node B is much dimmer than the signal received from the other antenna. The ideal case for testing would be to have complete obstruction of one of both antennas while the other one is not obstructed.
It is very helpful to the field engineers if the network operator provides the details of a suitable location to perform this test.

Note: The UE should be able to detect the Secondary Synchronization Codes sequence transmitted by the cell SCH even if it receives only one every two SSCs, (note, the actual SSCs do not need to be captured as part of the test).

Switch the UE on. Ensure that the UE gets connected to the network in appropriate time.

**Expected behaviour**

UE attaches to the network in appropriate time.

### 21.2.2 Space Time transmit Diversity (STTD)

**Description**

Verification that UE performs correctly STTD for P-CCPCH, S-CCPCH, PICH, AICH, DPCH, HS-PDSCH, and HS-SCCH, F-DPCH, MICH, E-AGCH, E-RGCH, and E-HICH.

**Related 3GPP core specifications**

TS 25.211 (Section 5.3.1.1).

**Reason for test**

To ensure UE supports STTD

**Initial configuration**

UE is switched off.

**Test procedure**

Switch the UE on in an area where network uses STTD and check it connects to the network in appropriate time.

Establish a voice or video-telephony call, keep it on for a long time in order to make sure the connection does not drop (P-CCPCH, AICH, DPCH are used to perform this test).

Arrange to receive an incoming Voice or Video-Telephony call, ensure the connection is established, the quality is good and the call is not dropped (P-CCPCH, S-CCPCH, PICH and DPCH are used to perform this test).

In case of UEs supporting HSDPA, establish a packet call (HSDPA connection), keep it down-load packet data for a long time in order to make sure the connection does not drop (HS-PDSCH and HS-SCCH are used to perform this test).

In case of UEs supporting HSUPA/HSDPA, establish a packet call (HSUPA/HSDPA connection), keep it up-load/down-load packet data for a long time in order to make sure the connection does not drop in both of up and down link (HS-PDSCH, HS-SCCH, F-DPCH, MICH, E-AGCH, E-RGCH, and E-HICH are used to perform this test).

**Expected behaviour**

UE has a correct behaviour.

### 21.2.3 Closed Loop Transmit Diversity

**Description**

Verification that the UE manages correctly mode 1 and mode 2 of closed loop transmit diversity for DPCH. There isn’t any expected difference in quality for CL mode 1 and mode 2, as quality will be driven by outer loop power control independently of Closed Loop Transmit Diversity.

Verification that the UE manages correctly mode 1 of closed loop transmit diversity for HS-PDSCH.

**Related 3GPP core specifications**

TS 25.214 (section 7)
Reason for test
To ensure UE supports both modes of Closed loop transmit diversity.

Initial configuration
UE in idle state.

Test procedure
Operator should provide information about a right location where these tests can be done.

Make a voice or video-telephony call in an area where closed loop mode 1 transmit diversity is used by the UTRAN. Make sure call is not dropped and its quality is acceptable (DPCH is used to perform this test).

Repeat the procedure in an area where closed loop mode 2 transmit diversity is used by the UTRAN. Make sure call is not dropped and its quality is acceptable (DPCH is used to perform this test).

Establish a packet call (HSDPA connection) in an area where closed loop mode 1 transmit diversity is used by the UTRAN, keep it down-load packet data for a long time in order to make sure the connection does not drop (HS-PDSCH is used to perform this test).

Expected behaviour
The call is not dropped and its quality is good.

21.3 PRACH Network Combinations

Description
Verification that the UE can establish DCH being in different PRACH UTRAN configuration.

Related 3GPP core specifications
TS 25211 (section 5.2.2.1), TS 34108 (section 6.10.2.4.4)

Reason for test
Ensure UE supports different PRACH configuration.

Test procedure
The goal of this test is to ensure UE supports different PRACH network configurations. Make at least one MO/MT voice or video-telephony call under all different PRACH configurations used by UTRAN.

Expected behaviour
Calls are correctly established in all configurations.

22 Mobility

22.1 Reselections

Description
The DUT should perform reselections without losing service.

Related core specifications
3GPP TS25.304, 3GPP TS 25.331, 3GPP TS 05.08

Reason for test
To ensure that the DUT performs reselections correctly without losing service.

Initial configuration
There must be an appropriate number of GERAN and UTRA cells available on the same PLMN.
Test procedures (Overview)

<table>
<thead>
<tr>
<th>Test Case Number</th>
<th>Test Case Title</th>
<th>UTRAN 3G -&gt; 3G (Scenario A)</th>
<th>Inter RAT (UTRAN / GERAN) 3G -&gt; 2G (Scenario B)</th>
<th>2G -&gt; 3G (Scenario C)</th>
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</thead>
<tbody>
<tr>
<td>22.1.1</td>
<td>GPRS Detach</td>
<td>X</td>
<td>X</td>
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<tr>
<td>22.1.2</td>
<td>GPRS Attach (No PDP)</td>
<td>X</td>
<td>X</td>
<td>n/a</td>
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<td>22.1.3</td>
<td>PDP (No Transfer)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>22.1.4</td>
<td>PDP (With Transfer)</td>
<td>n/a</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Scenario A: 3G -> 3G
3. Perform reselections between different a 3G cells.
4. Ideally, the test route should contain as many of the scenarios as possible:
   • Between cells sharing a Location Area and Routing Area.
   • Between cells not sharing a Location Area and/or a Routing Area.
   • Between cells using the same frequency.
   • Between cells using different frequencies.
   • Between cells using different frequency bands.
   • Between cells supporting PS(R99) and/or HSPA.
   • In areas of poor signal strength.

Scenario B: 3G -> 2G
1. Perform reselections between a 3G cell and a 2G cell.
2. Ideally, the test route should contain as many of the scenarios as possible:
   • Between 3G cells supporting PS(R99) and 2G cells supporting GPRS.
   • Between 3G cells supporting PS(R99) and 2G cells supporting EGPRS.
   • Between 3G cells supporting HSPA and 2G cells supporting GPRS.
   • Between 3G cells supporting HSPA and 2G cells supporting EGPRS.
   • In areas of poor signal strength.

Scenario C: 2G -> 3G
1. Perform reselections between a 2G cell and a 3G cell.
2. Ideally, the test route should contain as many of the scenarios as possible:
   • Between 2G cells supporting GPRS and 3G cells supporting PS(R99).
   • Between 2G cells supporting GPRS and 3G cells supporting HSPA.
   • Between 2G cells supporting EGPRS and 3G cells supporting PS(R99).
   • Between 2G cells supporting EGPRS and 3G cells supporting HSPA.
   • In areas of poor signal strength.

22.1.1 GPRS Detach
Test procedure
4. Perform GPRS detach on DUT (AT+cgatt=0) or use a SIM card without GPRS provisioning.
5. Perform the instruction of the desired scenario.
6. Page (Voice/SMS) the DUT before and after reselections.
Expected Behaviour
1. Ensure DUT is GPRS detached.
2. Ensure DUT performs reselections as expected and remains in service at all times.
3. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

22.1.2 GPRS Attach (No PDP)
Test procedure
4. Perform GPRS attach on DUT (AT+cgatt=1).
5. Perform the instruction of the desired scenario.
6. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
4. Ensure DUT is GPRS attached and has no PDP context active.
5. Ensure DUT performs reselections as expected and remains in service at all times.
6. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

22.1.3 PDP (No Transfer)
Test procedure
5. Establish a PDP context on DUT.
6. Block all data traffic and monitor RRC Channel Type.
7. Perform the instruction of the desired scenario.
8. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
5. Ensure DUT has PDP context established successfully.
6. No data traffic on-going and device is moved to Channel State PCH or RRC_IDLE.
7. Ensure DUT performs reselections as expected and remains in service at all times.
8. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

22.1.4 PDP (With Transfer)
Test procedure
4. Set up a Tethering connection on DUT and download a large file via FTP.
5. Perform the instruction of the desired scenario.
6. Page (Voice/SMS) the DUT before and after reselections.

Expected Behaviour
4. DUT is successfully tethered and actively downloading data.
5. Ensure DUT performs reselections as expected and remains in service at all times. The data session should resume after the reselection and the data rate shall be as expected for the data bearer type assigned by the network throughout the test.
6. Ensure DUT can be paged (Voice/SMS) before and after the reselections.

22.2 Dedicated Mode Handovers
Description
DUT should perform handovers as requested by the network, and behave as expected from the user perspective without losing service.
Related core specifications
3GPP TS 25.304, 3GPP TS 25.331, 3GPP TS 05.08, 3GPP TS 04.18, 3GPP TS 24.008, TS 45.008

Reason for test
To ensure DUT performs handovers correctly without losing service.

Initial configuration
There must be an appropriate number of 3G and 2G cells available on the same PLMN.
For tests involving Data, the RAB in question is available throughout the test route.
<table>
<thead>
<tr>
<th>Test Case Number</th>
<th>Test Case Title</th>
<th>UTRAN (Intra-Frequency: Scenario A)</th>
<th>UTRAN (Inter-Frequency: Scenario B)</th>
<th>UTRAN (Inter-Band: Scenario C)</th>
<th>Inter RAT (UTRAN / GERAN)</th>
<th>WB-AMR</th>
<th>A5/3 Ciphering</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.2.1</td>
<td>Voice NB</td>
<td>X X X X X n/a n/a n/a n/a</td>
<td>X X X n/a n/a</td>
<td>X X X n/a n/a n/a</td>
<td>X X X X X</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.2</td>
<td>Voice WB-AMR</td>
<td>X X X X n/a n/a</td>
<td>X X X</td>
<td>X X n/a</td>
<td>X X X X X</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.3</td>
<td>Video</td>
<td>X X X n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.4</td>
<td>PS Data</td>
<td>X X X X n/a</td>
<td>X X X</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.5</td>
<td>PS Data + Voice</td>
<td>X X X n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.6</td>
<td>PS Data + Video</td>
<td>X X X n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>22.2.7</td>
<td>CS Data</td>
<td>X X X X n/a</td>
<td>X X X</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Scenario A: Intra-Frequency (FDD X; Frequency: X -> FDD X; Frequency: X)
1. Perform handover between 3G cells using the same frequency within the same frequency band.
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between cells of the same Node-B.
   - Between cells of different Node-B's, sharing the same RNC.
   - Between cells of different RNCs interconnected with an Iur interface.
   - Between cells of different RNCs without an Iur interface.
   - Between cells supporting PS(R99) and, or HSPA

Scenario B: Inter-Frequency (FDD X; Frequency: X -> FDD X; Frequency: Y)
1. Perform handover between 3G cells using different frequencies within the same frequency band.
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between cells of the same Node-B.
   - Between cells of different Node-B's, sharing the same RNC.
   - Between cells of different RNCs interconnected with an Iur interface.
   - Between cells of different RNCs without an Iur interface.
   - Between cells supporting PS(R99) and, or HSPA

Scenario C: Inter-Band (FDD X -> FDD Y)
1. Perform handover between 3G cells using different frequency bands. (e.g. FDD1 & FDDVIII).
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between cells of the same Node-B.
   - Between cells of different Node-B's, sharing the same RNC.
   - Between cells of different RNCs interconnected with an Iur interface.
   - Between cells of different RNCs without an Iur interface.
   - Between cells supporting PS(R99) and, or HSPA
Scenario D: 3G -> 2G
1. Perform handover between 3G cells and a 2G cells.
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between 3G cells supporting PS(R99) and 2G cells supporting GPRS
   - Between 3G cells supporting PS(R99) and 2G cells supporting EGPRS
   - Between 3G cells supporting HSPA and 2G cells supporting GPRS
   - Between 3G cells supporting HSPA and 2G cells supporting EGPRS

Scenario E: 2G -> 3G
1. Perform handover between 2G cells and 3G cells.
2. Ideally, the test route should contain as many of the scenarios as possible:
   - Between 2G cells supporting GPRS and 3G cells supporting PS(R99)
   - Between 2G cells supporting GPRS and 3G cells supporting HSPA
   - Between 2G cells supporting EGPRS and 3G cells supporting PS(R99)
   - Between 2G cells supporting EGPRS and 3G cells supporting HSPA

Scenario F: 3G(WB) -> 2G(WB)
1. Perform handover from a 3G cell supporting WB-AMR to 2G cell supporting WB-AMR.
2. Ensure the call is continuously performed as transcoder free WB-AMR call.

Scenario G: 2G(WB) -> 3G(WB)
1. Perform handover from a 2G cell supporting WB-AMR to a 3G cell supporting WB-AMR.
2. Ensure the call is continuously performed as transcoder free WB-AMR call.

Scenario H: 2G(WB) -> 2G(WB)
1. Perform handover between different 2G cells supporting WB-AMR.
2. Ensure the call is continuously performed as Tandem Free WB-AMR call.

Scenario I: 3G(WB) -> 2G(NB)
1. Perform handover from a 3G cell supporting WB-AMR to a 2G cell not supporting WB-AMR.
2. Ensure the call the voice call is continued as transcoded call with narrow band (AMR-FR, AMR-HR, EFR, FR or HR) depending on the 2G network capability/decision.

Scenario J: 3G(UEA1) -> 2G(A5/3)
1. Perform handover from a 3G cell to 2G cell supporting A5/3 ciphering.
2. Ensure DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in HANDOVER COMMAND from the network.

Scenario K: 2G(A5/3) -> 2G(A5/3)
3. Perform handover between different 2G cells supporting A5/3 ciphering.
4. Ensure DUT receives “cipher with algorithm A5/3” within CIPHER MODE SETTING in HANDOVER COMMAND from the network.

Scenario L: 2G(A5/3) -> 2G(A5/1)
Perform handover from a 2G cell supporting A5/3 ciphering to a 2G cell supporting A5/1 ciphering only.

Scenario M: 2G(A5/1) -> 2G(A5/3)
3. Perform handover from a 2G cell supporting A5/1 ciphering only to a 2G cell supporting A5/3 ciphering.
4. Ensure DUT receives "cipher with algorithm A5/3" within CIPHER MODE SETTING in HANDOVER COMMAND from the network.

### 22.2.1 Voice NB

**Test procedure**
5. Set up NB MO Voice call (AMR-FR, AMR-HR, EFR, FR or HR) to Client 1 in a static location on the desired RAT.
6. Perform the instruction of the desired scenario.
7. End NB Voice call on DUT.
8. Page (Voice / SMS) the DUT.

**Expected Behaviour**
5. NB Voice call set up successfully.
6. The call should remain active at all times, without any loss or degradation of Voice quality.
7. Ensure NB Voice call is ended.
8. DUT can be paged successfully.

### 22.2.2 Voice WB-AMR

**Test procedure**
5. Set up WB-AMR MO Voice call to Client 1 in a static location on the desired RAT.
6. Follow the instruction of the desired scenario.
7. End WB-AMR Voice call on DUT.
8. Page (Voice / SMS) the DUT.

**Expected Behaviour**
5. WB-AMR Voice call set up successfully.
6. The call should remain active at all times, without any loss or degradation of Voice quality.
7. Ensure WB-AMR Voice call is ended.
8. DUT can be paged successfully.

### 22.2.3 Video

**Test procedure**
1. Set up a bi-directional Video call to Client 1 in a static location on the desired RAT.
2. Follow the instruction of the desired scenario.
3. End Video call on DUT.
4. Page (Voice / SMS) the DUT.

**Expected Behaviour**
1. Video call set up successfully.
2. The call should remain active at all times, without any loss or degradation of either audio or video quality.
3. Ensure Video call is ended.
4. DUT can be paged successfully.
22.2.4 PS Data

Test procedure
1. Set up a Tethering connection on DUT in a static location on the desired RAT.
2. Download a large file via FTP.
3. Follow the instruction of the desired scenario.
4. End Tethering connection on DUT.
5. Page (Voice / SMS) the DUT.

Expected Behaviour
1. DUT is successfully tethered.
2. DUT is actively downloading data.
3. The data rate shall be as expected for the data bearer type assigned by the network throughout the test.
4. Ensure Tethering connection is ended.
5. DUT can be paged successfully.

22.2.5 PS Data + Voice

Test procedure
1. Set up MO Voice call to Client 1 in a static location on the desired RAT.
2. In parallel set up a Tethering connection on DUT and download a large file via FTP.
3. Follow the instruction of the desired scenario.
4. End Tethering connection on DUT.
5. End Voice call on DUT.
6. Page (Voice / SMS) the DUT.

Expected Behaviour
1. Voice call set up successfully.
2. DUT is successfully tethered and actively downloading data.
3. The data rate shall be as expected for the data bearer type assigned by the network throughout the test. The call should remain active at all times, without any loss or degradation of Voice quality.
4. Ensure Tethering connection is ended.
5. Ensure Voice call is ended.
6. DUT can be paged successfully.

22.2.6 PS Data + Video

Test procedure
1. Set up a bi-directional Video call to Client 1 in a static location on the desired RAT.
2. In parallel set up a Tethering connection on DUT and download a large file via FTP.
3. Follow the instruction of the desired scenario.
4. End Tethering connection on DUT.
5. End Video call on DUT.
6. Page (Voice / SMS) the DUT.
Expected Behaviour
1. Video call set up successfully.
2. DUT is successfully tethered and actively downloading data.
3. The data rate shall be as expected for the data bearer type assigned by the network throughout the test. The call should remain active at all times, without any loss or degradation of either audio or video quality.
4. Ensure Tethering connection is ended.
5. Ensure Video call is ended.
6. DUT can be paged successfully.

22.2.7 CS Data

Test procedure
5. Set up CS Data call in a static location on the desired RAT.
6. Perform the instruction of the desired scenario.
7. End CS Data call on DUT.
8. Page (Voice / SMS) the DUT.

Expected Behaviour
5. CS Data call set up successfully.
6. The call should remain active at all times.
7. Ensure CS Data call is ended.
8. DUT can be paged successfully.

23 PS/CS Data

23.0 Introduction notes

23.0.1 Operating Systems
The end-to-end performance tests may require the use of external terminal equipment connected to the Device Under Test (DUT) through the reference point. The version of the Operating System and Drivers of the external terminal equipment shall be recorded.

23.0.2 Connectivity
The end-to-end performance tests may require the use of different means of connectivity connecting the device under test (DUT) to an external terminal equipment. In this case, the type of the connectivity shall be recorded.

23.0.3 SIM/USIM subscription
Some tests may need specific subscriber subscription.

23.1 PDP Context Activation / Deactivation

23.1.1 PDP type=IP

Description
Verify that the UE can successfully activate a primary PDP context With an IP type IP. Applicable to UEs supporting PC connectivity and at least one packet switched service.
Related core specifications
3GPP TS 24.008 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

Reason for test
To ensure that the UE is able to activate a PDP context, type IP, correctly.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN that is supporting PS data.

Test procedure
1. With a HyperTerminal connected to the UE, define the type of PDP context with the AT Command AT+CGDCONT with PDP type =IP and available APN and IP address
2. Activate the PDP context with the AT Command AT+CGACT

Expected behaviour
The UE shall be able to establish the PDP context.
The response on the HyperTerminal after the AT+CGACT shall be OK

23.1.2 PDP type=PPP

Description
Verify that the UE can successfully activate a primary PDP context with an IP type PPP. Applicable to UEs supporting PC connectivity and at least one packet switched service.

Related core specifications
3GPP TS 24.008 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

Reason for test
To ensure that the UE is able to activate a PDP context, type PPP, correctly if the network supports the PDP type PPP.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN that is supporting PS data.

Test procedure
1. With a HyperTerminal connected to the UE, define the type of PDP context with the AT Command AT+CGDCONT with PDP type =PPP and available APN and IP address
2. Activate the PDP context with the AT Command AT+CGACT

Expected behaviour
The UE shall be able to establish the PDP context.
The response on the HyperTerminal after the AT+CGACT shall be OK

23.1.3 MO PDP context activation

Description
Verify that the UE can successfully activate a primary PDP context.

Related core specifications
3GPP TS 24.008 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

Reason for test
To ensure that the UE is able to activate a PDP context correctly.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN that is supporting PS data.
Test procedure

Scenario A:
Activate a PDP from an external device tethered to the UE using any PS bearer supported by the UE and by its 3G HPLMN.
1. Verify that the session is established.
2. Ping a known reachable IP address and verify that the ping is successful.

Scenario B:
1. Activate a PDP via the embedded Browsing application using any PS bearer supported by the UE and by its 3G HPLMN. If the UE establishes a PDP context automatically after power-on or after leaving flight mode, this behaviour is acceptable as part of this test case as well.
2. Verify that the session is established.

Expected behaviour

The UE shall be able to establish the PDP context.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRC (Connection Request)</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC (Connection Setup)</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRC (Connection Setup Complete)</td>
<td>RRC</td>
</tr>
<tr>
<td>4</td>
<td>→</td>
<td>RRC (Initial Direct Transfer - CM Service Request)</td>
<td>CM</td>
</tr>
<tr>
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<td>RRC (Direct Transfer - GMM Authentication Request)</td>
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<td>6</td>
<td>→</td>
<td>RRC (Direct Transfer - GMM Authentication Response)</td>
<td>MM</td>
</tr>
<tr>
<td>7</td>
<td>←</td>
<td>RRC (Security Mode Command)</td>
<td>RRC</td>
</tr>
<tr>
<td>8</td>
<td>→</td>
<td>RRC (Security Mode Command Complete)</td>
<td>RRC</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>RRC (Direct Transfer - Activate PDP Context Request)</td>
<td>SM</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRC (Radio Bearer Setup)</td>
<td>RRC</td>
</tr>
<tr>
<td>11</td>
<td>→</td>
<td>RRC (Radio Bearer Setup Complete)</td>
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<tr>
<td>12</td>
<td>←</td>
<td>RRC (Direct Transfer - Activate PDP Context Accept)</td>
<td>SM</td>
</tr>
</tbody>
</table>

23.1.4 Manual MO PDP context deactivation

Description
Verify that the UE can successfully deactivate a PDP context.

Related core specifications
3GPP TS 24.008 6.1.3.4.1 (PDP context deactivation initiated by the MS)

Reason for test
To ensure that the UE is able to deactivate a PDP context correctly.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN

Test cases to be performed

Scenario A:
1. Establish a PDP context from an external device tethered to the UE.
2. Manage to deactivate the PDP context.
3. Ping a known reachable IP address and verify that the ping is unsuccessful.

Scenario B:
1. Activate a PDP context via the embedded Browsing application using any PS bearer supported by the UE and by its 3G HPLMN. If the UE establishes a PDP context automatically after power-on or after leaving flight mode, this behaviour is acceptable as part of this test case as well.
2. Deactivate the PDP context and verify that the PDP context is de-activated by one of the following means:
   - Close the Browser application and verify that the PDP context is de-activated.
   - Disable the use of data services in the settings menu of the UE in case the PDP context is maintained per default even when all applications are closed that require IP connectivity. The PDP context is then deactivated with a PDP context deactivation procedure or implicitly with a detach request.
   - Enable flight mode and verify that the PDP context is properly deactivated before the device detaches itself from the network. PDP context is then deactivated with a PDP context deactivation procedure or implicitly with a detach request.

**Expected behaviour**

The UE shall be able to deactivate the PDP context and consequently lose network connectivity

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRC (Direct Transfer - Deactivate PDP Context Request)</td>
<td>SM</td>
</tr>
<tr>
<td>2</td>
<td>➔</td>
<td>RRC (Direct Transfer - Deactivate PDP Context Accept)</td>
<td>SM</td>
</tr>
<tr>
<td>3</td>
<td>←</td>
<td>RRC (Radio Bearer Release)</td>
<td>RRC</td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>RRC (Radio Bearer Release Complete)</td>
<td>RRC</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>RRC (Connection Release)</td>
<td>RRC</td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>RRC (Connection Release Complete)</td>
<td>RRC</td>
</tr>
</tbody>
</table>

**23.1.5 No MO PDP context deactivation without user action**

**Description**

Verify that there is no PDP context deactivation for a time lower than no activity timeout. This test is possible when the Core Network has a timeout available for no activity on PDP.

**Related core specifications**

3GPP TS 24.008

**Reason for test**

To ensure that the UE does not deactivate PDP context without user action.

**Initial configuration**

The UE is IMSI attached and PS attached in its 3G HPLMN

**Test procedure**

**Scenario A:**

1. Establish an externally initiated packet data session.
2. Wait for the Core Network no activity timeout.

**Scenario B:**

1. Activate a PDP via the embedded Browsing application using any PS bearer supported by the UE and by its 3G HPLMN.
2. Wait for the Core Network no activity timeout.

**Expected behaviour**

No PDP context deactivation during a time lower than the any activity timeout and verify that user is informed for the PDP context deactivation.

**23.1.6 Network initiated PDP context deactivation**

**Description**

Verify that the UE can successfully accept a PDP context deactivation.
This test is possible when the Core Network has a timeout available for no activity on PDP.

**Related core specifications**

3GPP TS 24.008 6.1.3.4.2 (PDP context deactivation initiated by the Network)

**Reason for test**

To ensure that the UE is able to deactivate a PDP context correctly.

**Initial configuration**

The UE is IMSI attached and PS attached in its 3G HPLMN

**Test procedure**

**Scenario A:**

1. Establish an externally initiated packet data session.
2. Wait for the Core Network no activity timeout.

**Scenario B:**

1. Activate a PDP via the embedded Browsing application using any PS bearer supported by the UE and by its 3G HPLMN.
2. Wait for the Core Network no activity timeout.

**Expected behaviour**

Information for the PDP context deactivation to the user and verify that user is informed for the PDP context deactivation.

**23.1.7 PDP context activation initiated by the UE, rejected by the network with cause unknown APN**

**Description**

Verify that the UE inform the user of reject of PDP context activation

**Related core specifications**

3GPP TS 24.008

**Reason for test**

To ensure that the UE is not able to activate a PDP context with unknown APN.

**Initial configuration**

The UE is IMSI attached and PS attached in its 3G HPLMN

**Test procedure**

1. Change the APN to an incorrect one (not defined in the HLR). This may be done for instance with a HyperTerminal connected to the UE, with the AT Command AT+CGDCONT or via the UE menu.
2. Try to activate a PDP context from an external device tethered to the UE.

**Scenario B:**

2. Try to activate a PDP via the embedded Browsing application.

**Expected behaviour**

Verify that the UE indicates for the PDP activation failure.

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRC (Direct Transfer - activate PDP Context Request)</td>
<td>SM</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC (Direct Transfer - activate PDP Context reject)</td>
<td>SM</td>
</tr>
<tr>
<td>3</td>
<td>←</td>
<td>RRC (Radio Bearer Release)</td>
<td>RRC</td>
</tr>
</tbody>
</table>
### 23.2 Multiple PDP Activation / Deactivation

#### 23.2.1 2 Simultaneous Primary PDP Context Activation

**Description**
Verify that the UE can successfully activate a second Primary PDP Context.

**Related core specifications**
3GPP TS 24.008 6.1.3.2.1 (Primary PDP Context Activation Procedure Initiated by the MS)

**Reason for test**
To ensure the UE is able to activate more than one Primary PDP context correctly.

**Initial configuration**
The UE is IMSI attached and PS attached in its 3G HPLMN
The UE has a PDP context already active.

**Test procedure**
1. Verify that a PDP context is already established.
2. Manage to activate a second Primary PDP context.
3. Verify that both Primary PDPs are active and data transfer is possible in both the PDPs.

**Expected behaviour**
The UE shall be able to activate the second Primary PDP context while maintaining the former PDP context active.

#### 23.2.2 2 Simultaneous Primary PDP Context - MO deactivation

**Description**
Verify that the UE can successfully deactivate a second Primary PDP Context.

**Related core specifications**
3GPP TS 24.008 6.1.3.4.1 (PDP context deactivation initiated by the MS)

**Reason for test**
To ensure that the UE is able to deactivate a second Primary PDP context correctly while maintaining the former PDP context active.

**Initial configuration**
The UE is IMSI attached and PS attached in its 3G HPLMN
The UE has two primary PDP contexts already activated by means of, for instance, an externally initiated packet data session and a WAP session.

**Test procedure**
1. Verify that an externally initiated packet data session is already established.
2. Verify that a WAP session is already established.
3. Manage to deactivate one of the primary PDP contexts (e.g. Terminate WAP session).
4. Verify that the corresponding session (e.g. WAP) is not active.
5. Verify that the other PDP context is still active (Ping a known IP address).

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<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE – NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>➔</td>
<td>RRC (Radio Bearer Release Complete)</td>
<td>RRC</td>
</tr>
<tr>
<td>5</td>
<td>←</td>
<td>RRC (Connection Release)</td>
<td>RRC</td>
</tr>
<tr>
<td>6</td>
<td>➔</td>
<td>RRC (Connection Release Complete)</td>
<td>RRC</td>
</tr>
</tbody>
</table>
Expected behaviour
The UE shall be able to deactivate one of the primary PDP contexts while maintaining the other PDP context active.

23.2.3 2 simultaneous primary PDP context - Network initiated deactivation

Description
Verify that the UE can successfully deactivate a second Primary PDP Context when a first Primary PDP context is activated. Applicable to UEs supporting multiple PDP context activation and at least two packet switched services.

Related core specifications
3GPP TS 24.008

Reason for test
To ensure the UE is able to deactivate one Primary PDP context correctly without impact on another PDP context.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN.
The UE has two PDP contexts already active by means of an externally initiated packet data session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Verify that a WAP session is already established.
3. Waiting for the Core Network no activity timeout.
4. Verify that user is informed for the PDP context deactivation.
5. Verify that a WAP session is already established.

Expected behaviour
The UE shall be able to deactivate one of the primaries PDP contexts while maintaining the other PDP context active.

23.2.4 Secondary MO PDP Context activation during a PS call

Description
To verify that the UE can successfully activate a secondary PDP Context. Applicable to UEs supporting secondary PDP context activation and at least one packet switched service.

Related core specifications
3GPP TS 24.008 6.1.3.2.1 (Successful Secondary PDP Context Activation Procedure Initiated by the MS)
3GPP TS 23.107

Reason for test
To ensure that the UE is able to activate a secondary PDP context correctly.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN.
The UE has a PDP context already active by means of, for instance, the embedded browsing application.

Test procedure
1. Verify that at least one PDP Context is already active.
2. Browse through HTML pages. The UMTS QoS class should be for instance “Background”.
3. Promote the activation of a secondary PDP context, for example, by starting a streaming session in parallel of web browsing. The UMTS QoS class should be different from the one in step 2 (e.g. “Interactive”).

**Expected behaviour**

The UE shall be able to activate the secondary PDP context by recognizing a different type of traffic (QoS class) from the one already established. A single APN and PDP address is used (for both primary and secondary PDP addresses).

### 23.2.5 Secondary MO PDP Context deactivation

**Description**

To verify that the UE can successfully deactivate a secondary PDP Context. Applicable to UEs supporting secondary PDP context activation and at least one packet switched service.

**Related core specifications**

3GPP TS 24.008 6.1.3.4.1 (PDP context deactivation initiated by the MS)

3GPP TS 23.107

**Reason for test**

To ensure that the UE is able to deactivate a secondary PDP context correctly without consequence on the primary PDP context activated.

**Initial configuration**

The UE is IMSI attached and PS attached in its 3G HPLMN

The UE has a PDP context already active by means of an externally initiated packet data session.

The UE has a secondary PDP context already active by means of an externally initiated packet data session with a FTP transfer.

**Test procedure**

1. Verify that an externally initiated packet data session is already established.
2. Browse through HTML pages. The UMTS QoS class should be “Interactive”.
3. Promote the activation of a secondary PDP context, for example, by starting an FTP download in parallel of web browsing. The UMTS QoS class should be “Background”.
4. Hang-up the connection corresponding to the secondary PDP context.

**Expected behaviour**

The UE shall be able to deactivate the secondary PDP context, the primary PDP context shall be always activated.

### 23.3 Service Request in roaming

#### 23.3.1 PDP context activation in roaming

**Description**

Verify that the UE can successfully activate a primary PDP context for a Roaming PLMN. Applicable to UEs supporting at least one packet switched service.

**Related core specifications**

3GPP TS 24.008 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

**Reason for test**

To ensure that the UE is able to activate a PDP context correctly for other PLMN.

**Initial configuration**

The UE is IMSI attached and PS attached in a Roaming PLMN that is supporting PS data.
Test procedure

1. Activate a PDP from an external device tethered to the UE or from the browsing embedded application.

2. Ping a known reachable IP address and verify that the ping is successful or open a new web page (not in the cache memory of the browser).

Expected behaviour
The UE shall be able to establish the PDP context.

23.4 Basic Traffic Cases

23.4.1 Ping a Remote Destination

Description
The UE pings a known IP address during an externally initiated packet data session. Applicable to UEs supporting at least one packet switched service.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to send a ping to a known IP address.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN and a PDP context is active by means of an externally initiated packet data session.

Test procedure

1. Verify that an externally initiated packet data session is already established.

2. Start a ping procedure. (Ping \(-t [-I size] [-w timeout] destination, for e.g. ping \(-t \-l 100 \-w 1000 10.11.26.52)\).  

3. Verify that the replies from the ping commands are correctly received.


Expected behaviour
The UE shall be able to ping the known IP address.

23.4.2 Browse Through HTML Page

Description
The UE browses through one or several html pages, during an externally initiated packet data session, in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to browse through html pages with a reasonable performance.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN and a PDP context active by means of an externally initiated packet data session.

Test procedure

1. Verify that an externally initiated packet data session is already established.
2. Open a web site and browse through for a while. Verify usual functionalities and qualitative performance.

**Expected behaviour**
The UE shall be able open and browse through html pages.

### 23.4.3 FTP Downlink

**Description**
The UE performs a downlink FTP, during an externally initiated packet data session, in order to verify functionality and performance.

**Related core specifications**
3GPP TS 25.331

**Reason for test**
To ensure that the UE is able to perform an FTP download.

**Initial configuration**
The UE is IMSI attached and PS attached in its 3G HPLMN and a PDP context active by means of an externally initiated packet data session.

**Test procedure**
1. Verify that an externally initiated packet data session is already established.
2. Connect to a known FTP Server (e.g. ftp.3gpp.org ) using an FTP client or using DOS command (ftp ftp.3gpp.org)
3. Manage to download a file.

**Expected behaviour**
The UE shall be able to connect to the FTP server and successfully download a file.

### 23.4.4 FTP Uplink

**Description**
The UE performs an uplink FTP, during an externally initiated packet data session, in order to verify functionality and performance.

**Related core specifications**
3GPP TS 25.331

**Reason for test**
To ensure that the UE is able to perform an FTP upload.

**Initial configuration**
The UE is IMSI attached and PS attached in its 3G HPLMN and a PDP context active by means of an externally initiated packet data session.

**Test procedure**
1. Verify that an externally initiated packet data session is already established.
2. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload contents.
3. Manage to upload a file.

**Expected behaviour**
The UE shall be able to connect to the FTP server and successfully upload a file.
23.4.5 Simultaneous FTP downlink and FTP Uplink

Description
The UE performs an uplink FTP and a simultaneous downlink FTP, during an externally initiated packet data session, in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to perform an FTP upload and FTP downlink.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN and a PDP context active by means of an externally initiated packet data session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload contents.
3. Open another FTP connection.
4. Manage to upload a file.
5. Manage to download other file

Expected behaviour
The UE shall be able to connect to the FTP server and successfully upload a file and download the files simultaneously.

23.5 QoS Classes

23.5.1 Subscribed QOS is accepted by the UE

Description
The purpose of the tests is to check that the User equipment is able to activate a PDP context in case the requested QOS is equal to "subscribed QOS".

Related core specifications
3GPP TS 24.008 clause 6.1.3.1
3GPP TS 27.007 (AT command)

Reason for test
To ensure the UE is able to activate a Primary PDP context correctly with the subscribed QOS

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN

For this test it is necessary to know the HLR QOS parameters subscriber profile

Test procedure
1. With a HyperTerminal connected to the UE, define the minimum QOS profile with the AT Command AT+CGEQMIN with values of QOS parameters set to a lower values than the HLR parameters for this instance
2. With a HyperTerminal connected to the UE, define the requested QOS profile with the AT Command AT+CGEQREQ with all values of QOS parameters set to "subscribed"
3. Active the PDP context with the AT Command AT+CGACT
Expected behaviour
The UE shall be able to establish the PDP context.
The response on the HyperTerminal after the AT+CGACT shall be OK

23.5.2 QoS requested is higher than subscribed QoS / Negotiated QoS is higher than minimum QoS set in the UE (success case)

Description
The purpose of the tests is to check that the User equipment is able to activate a PDP context in case the negotiated QOS is lower than the requested one but better than the minimum QOS set in the UE.

Related core specifications
3GPP TS 24.008 clause 6.1.3.1
3GPP TS 27.007 (AT command)

Reason for test
To ensure the UE is able to activate a Primary PDP context correctly with requested QOS better than subscribe QOS

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN
For this test it is necessary to know the HLR QOS parameters subscriber profile

Test procedure
1. With a HyperTerminal connected to the UE, define the minimum QOS profile with the AT Command AT+CGEQMIN with values of QOS parameters set to a lower values than the HLR parameters for this instance
2. With a HyperTerminal connected to the UE, define the requested QOS profile with the AT Command AT+CGEQREQ with values of QOS parameters set to a better values than the HLR parameters for this instance
3. Active the PDP context with the AT Command AT+CGACT

Expected behaviour
The UE shall be able to establish the PDP context.
The response on the HyperTerminal after the AT+CGACT shall be OK

23.5.3 QoS requested is higher than subscribed QoS / Negotiated QoS is lower than minimum QoS set in the UE (failure case)

Description
The purpose of the tests is to check that the User equipment is able to cancel PDP context activation in case the negotiated QOS is lower than the requested one and lower than the minimum QOS set in the UE.

Related core specifications
3GPP TS 24.008 clause 6.1.3.1
3GPP TS 27.007 (AT command)

Reason for test
To ensure the UE is able to activate a Primary PDP context correctly with requested QOS better than subscribe QOS

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN
For this test it is necessary to know the HLR QOS parameters subscriber profile
Test procedure
1. With a HyperTerminal connected to the UE, define the minimum QOS profile with the AT Command AT+CGEQMIN with values of QOS parameters set to a better values than the HLR parameters for this instance.
2. With a HyperTerminal connected to the UE, define the requested QOS profile with the AT Command AT+CGEQREQ with values of QOS parameters set to a better values than the HLR parameters for this instance.
3. Activate the PDP context with the AT Command AT+CGACT.

Expected behaviour
The UE shall be able to establish the PDP context.
The response on the HyperTerminal after the AT+CGACT shall be NOK.

23.6 PS Bearer support

23.6.1 PS call using 64/64 RB - FTP UL / FTP DL
Description
The UE establishes PS data call using a 64/64 RAB. The throughput is verified by means of a FTP download.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to establish a PS call using a 64/64 RAB. Verify if data throughput is proportional to the referred RAB.

Initial configuration
Ensure the availability of a SIM(USIM) card with data subscription profile limited to 64/64 kbps.
The UE is IMSI attached and PS attached in its 3G HPLMN.

Test procedure
1. Initiate an externally initiated packet data session using PS bearer 64/64 kbps.
2. Verify that the externally initiated packet data session is established.
3. Start a downlink FTP of file (file size > 2 Mbytes)
4. Verify throughput using a suitable application monitor (statistics).

Expected behaviour
The UE shall be able to establish an externally initiated packet data session using the 64/64 kbps PS Radio Access Bearer. The throughput verified by means of an FTP download should be proportional to RAB established.

23.6.2 PS call using 64/128 RB - FTP UL / FTP DL
Description
The UE establishes PS data call using a 64/128 RAB. The throughput is verified by means of a FTP download.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to establish a PS call using a 64/128 RAB. Verify if data throughput is proportional to the referred RAB.

Initial configuration
Ensure the availability of a SIM(USIM) card with data subscription profile limited to 64/128 kbps.
The UE is IMSI attached and PS attached in its 3G HPLMN.

Test procedure
1. Initiate an externally initiated packet data session using PS bearer 64/128 kbps.
2. Verify that the externally initiated packet data session is established.
3. Start a downlink FTP of file (file size > 2 Mbytes)
4. Verify throughput using a suitable application monitor (statistics).

Expected behaviour
The UE shall be able to establish an externally initiated packet data session using the 64/128 kbps PS Radio Access Bearer. The throughput verified by means of an FTP download should be proportional to RAB established.

23.6.3 PS call using 64/384 RB - FTP UL / FTP DL
Description
The UE establishes PS data call using a 64/384 RAB. The throughput is verified by means of a FTP download.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to establish a PS call using a 64/384 RAB. Verify if data throughput is proportional to the referred RAB.

Initial configuration
Ensure the availability of a SIM(USIM) card with data subscription 64/384 kbps profile available.
The UE is IMSI attached and PS attached in its 3G HPLMN.

Test procedure
1. Initiate an externally initiated packet data session using PS bearer 64/384 kbps.
2. Verify that an externally initiated packet data session is established.
3. Start a downlink FTP of file (file size > 2 Mbytes)
4. Verify throughput using a suitable application monitor (statistics).

Expected behaviour
The UE shall be able to establish an externally initiated packet data session using the 64/384 kbps PS Radio Access Bearer. The throughput verified by means of an FTP download should be proportional to RAB established.

23.7 CS Bearer support

23.7.1 CS MO data call
Description
Call handling for MO data calls for different Radio Access Bearer.
The RABs use depends of subscriber profile, UE configuration and network configuration for service.

Related core specifications
3GPP TS 22.002 §3.1 (General bearer service user data characteristics)
3GPP TS 23.910
Reason for test
To ensure that MO data calls for different RABs to a variety of destination are properly handled.

Initial configuration
The UE is IMSI attached and CS attached in its 3G HPLMN.

Test procedure
For each of the following call configurations, make an outgoing MO data call. Ensure that the call completes and the data is exchanged correctly.

1. Transparent asynchronous services (BS 20T), 3.1khz, user rate 28.8 kbit/s
2. Non transparent asynchronous services (BS 20 NT), 3.1khz, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s.
3. Non transparent asynchronous services (BS 20 NT), UDI, V.110, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s, 38.4 kbit/s
4. Non transparent asynchronous services (BS 20 NT), UDI/RDI, V.120, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s, 38.4 kbit/s, 48 kbit/s, 56 kbit/s.
5. Non transparent asynchronous services (BS 20 NT for PIAFS), UDI, PIAFS user rate can be: 32 kbit/s, 64 kbit/s.
6. Non transparent asynchronous services (BS 20 NT for Frame Tunnelling Mode), RDI/UDI, X31 flag stuffing user rate can be: 56 kbit/s, 64 kbit/s.
7. Transparent synchronous services (BS 30 T), 3.1 kHz user rate 28.8 kbit/s.
8. Transparent synchronous services (BS 30 T), UDI/RDI V110, user rate can be: 56 kbit/s, 64 kbit/s.
9. Transparent synchronous services (BS 30 T for Multimedia), 3.1kHz/UDI/RDI, H223 & H245 user rate can be: 28.8 kbit/s, 32 kbit/s, 33.6 kbit/s, 56 kbit/s, and 64 kbit/s.

Expected behaviour
The calls complete and the data is exchanged correctly.

23.7.2 CS MT data call
Description
Call handling for MT data calls for different Radio Access Bearer.
The RABs use depends of subscriber profile, UE configuration and network configuration for service.

Related core specifications
3GPP TS 22.002 §3.1 (General bearer service user data characteristics)
3GPP TS 23.910

Reason for test
To ensure that MT data calls for different RABs to a variety of destination are properly handled.

Initial configuration
The UE is IMSI attached and CS attached in its 3G HPLMN.

Test procedure
For each of the following call configurations, make an outgoing MT data call. Ensure that the call completes and the data is exchanged correctly.

1. Transparent asynchronous services (BS 20T), 3.1khz, user rate 28.8 kbit/s
2. Non transparent asynchronous services (BS 20 NT), 3.1khz, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s.
3. Non transparent asynchronous services (BS 20 NT), UDI, V.110, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s, 38.4 kbit/s.

4. Non transparent asynchronous services (BS 20 NT), UDI/RDI, V.120, user rate can be 0.3 kbit/s, 1.2 kbit/s, 2.4 kbit/s, 4.8 kbit/s, 9.6 kbit/s, 14.4 kbit/s, 19.2 kbit/s, 28.8 kbit/s, 38.4 kbit/s, 48 kbit/s, 56 kbit/s.

5. Non transparent asynchronous services (BS 20 NT for PIAFS), UDI, PIAFS user rate can be: 32 kbit/s, 64 kbit/s.

6. Non transparent asynchronous services (BS 20 NT for Frame Tunnelling Mode), RDI/UDI, X31 flag stuffing user rate can be: 56 kbit/s, 64 kbit/s.

7. Transparent synchronous services (BS 30 T), 3.1 kHz user rate 28.8 kbit/s.

8. Transparent synchronous services (BS 30 T), UDI/RDI V110, user rate can be: 56 kbit/s, 64 kbit/s.

9. Transparent synchronous services (BS 30 T for Multimedia), 3.1kHz/UDI/RDI, H223 & H245 user rate can be: 28.8 kbit/s, 32 kbit/s, 33.6 kbit/s, 56 kbit/s, and 64 kbit/s.

Expected behaviour
The calls complete and the data is exchanged correctly.

### 23.8 PS Performance

#### 23.8.1 PDP Activation Time measure

**Description**
Measure the time the UE takes to correctly activate a PDP context.

**Related core specifications**
3GPP TS 24.008

**Reason for test**
For performance reasons, measure that the UE is able to establish a PDP context in a suitable time interval.

**Initial configuration**
The UE is IMSI attached and PS attached in its 3G HPLMN.

**Test procedure**
1. Start the activation of a PDP context by means of an externally initiated packet data session.
2. Verify that the externally initiated packet data session is established, for e.g. using ping to a known IP address.
3. Measure the time between step 1 and step 2.

The referred test procedure should be performed for several times and then treated statistically. This is important to guarantee results accuracy.

**Expected behaviour**
The UE shall be able to, in average, establish a PDP context in a suitable time when compared to other UE's on the same network configuration.

#### 23.8.2 PDP Deactivation Time measure

**Description**
Measure the time the UE takes to correctly deactivate a PDP context.

**Related 3GPP core specifications**
3GPP TS 24.008 6.1.3.4.1 (PDP context deactivation initiated by the MS)
Reason for test
For performance reasons, ensure that the UE is able to deactivate a PDP context correctly in a reasonable time.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN
The UE has a PDP context already active by means of an externally initiated packet data session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Start a ping command (using –t option) to a known IP address.
3. Manage to deactivate the PDP context.
4. Verify when the ping starts to be unsuccessful.
5. Measure the time between step 3 and step 4.

The referred test procedure should be performed for several times and then treated statistically. This is important to guarantee results accuracy.

Expected behaviour
The UE shall be able to, in average, deactivate the PDP context and lose network connectivity within a reasonable period of time when compared to other UE's on the same network configuration.

23.8.3 Delay HTML (web page size / number of elements)

Description
Measure the time the UE takes to correctly download and render a Web page containing pictures, text and CSS formatting.

This test is possible with UE support HTML format. Alternatively, if the browsing embedded application doesn’t support HTML format, the download can be performed from an external device (e.g. a laptop) tethered to the UE.

Related core specifications
3GPP TS 24.008, section 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

Reason for test
To ensure that the UE guarantees an acceptable performance in case of repeated downloads of small size files, such as HTML web pages.

Two test procedures are defined, one to give an indication of the download speed and one to give an indication of the download speed and the time taken to perform the FACH to DCH state transition.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN.

The UE has a PDP context already active by means of internal browsing application or, alternatively, by means of an external device (e.g. via an externally initiated packet data session or an internet sharing session).

1. Manage on the UE (or on the external device) to download the same reference web page rapidly 10 times in a row. (Ensure that the page is downloaded from the network each time and not just loaded from the browser cache)
2. Verify that the download of the page is correct each time (number of elements)
3. Measure the time to download the 10 WEB pages and calculate the average download time per page.
4. Manage on the UE (or on the external device) to download the same reference web page 10 times in a row leaving a 30 second pause between each download. (Ensure that the page is downloaded from the network each time and not just loaded from the browser cache)
5. Verify that the download of the page is correct each time (number of elements)
6. Measure the time to download the 10 WEB pages and calculate the average download time per page.

Expected behaviour
The UE shall be able to, in average, download a reference Web page within a reasonable period of time when compared to other UE’s on the same network.

23.8.4 Throughput Measure - Downlink FTP for PS RABs (64/64k, 64/128k, 64/384k)

Description
Measure the average downlink throughput for the defined PS RABs (64/64k, 64/128k, 64/384k).

Related core specifications
3GPP TS 25.331

Reason for test
Obtain a measure of average downlink throughput for each RAB.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN.
The UE has a PDP context already active by means of an externally initiated packet data session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Start an FTP download using one of the PS RABs. Use a file larger than 5Mbytes.
3. Measure the throughput using a suitable application.
4. The referred test procedure should be performed for each of the PS RAB defined.

Expected behaviour
The UE shall be able to present average throughput values proportional to PS RAB used.

23.8.5 Throughput Measure - Uplink FTP for PS RAB

Description
Measure the average uplink throughput for the defined PS RABs.

Related core specifications
3GPP TS 25.331

Reason for test
Obtain a measure of average uplink throughput for the PS RABs (UL 64K).

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN.
The UE has a PDP context already active by means of an externally initiated packet data session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Start an FTP upload using one of the PS RABs (all use 64k in uplink). Use a file larger than 5 Mbytes.
3. Measure the throughput using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to PS RAB used (UL 64k).
23.8.6 Simultaneous Throughput Measure – Uplink and Downlink FTP for PS RAB (64/64k, 64/128k, 64/384k)

Description
Measure the average simultaneous uplink and downlink throughput for the defined PS RABs.

Related core specifications
3GPP TS 25.331

Reason for test
Obtain a measure of average simultaneous uplink and downlink uplink throughput for the PS RABs (UL 64K).

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN
The UE has a PDP context already active by means of an externally initiated packet data session.

Test procedure
a. Verify that an externally initiated packet data session is already established.
b. Start an FTP upload using one of the PS RABs (all use 64k in uplink). Use an uncompressible file larger than 5 Mbytes.
c. Simultaneously start an FTP upload. Use an uncompressible file larger than 1 MByte.
d. Measure the throughput of both the upload and download using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to PS RAB used (UL 64k).

23.9 CS performance

23.9.1 CS Data call establishment duration

Description
Measure the time the UE takes to establish a CS data call.

Related core specifications
3GPP TS 24.008

Reason for test
For performance reasons, measure that the UE is able to establish a CS data call in a suitable time interval.

Initial configuration
The UE is IMSI attached in its 3G HPLMN.

Test procedure
1. Start the establishment of a CS data modem connection by means of an externally initiated CS data session.
2. Verify that the externally initiated CS data session is established, for e.g. using ping to a known IP address.
3. Measure the time between step 1 and step 2.

The referred test procedure should be performed for several times and then treated statistically. This is important to guarantee results accuracy.

Expected behaviour
The UE shall be able to, in average, establish a CS data modem connection in a suitable time.
23.9.2   CS Data call release duration

Description
Measure the time the UE takes to correctly hang up CS data call.

Related core specifications
3GPP TS 24.008

Reason for test
For performance reasons, ensure that the UE is able to hang up a CS modem data call correctly in a reasonable time.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN
The UE has a CS modem data call already active by means of an externally initiated CS data session.

Test procedure
1. Verify that an externally initiated CS data session is already established.
2. Start a ping command (using –t option) to a known IP address.
3. Manage to hang up the CS Modem data call.
4. Verify when the ping starts to be unsuccessful.
5. Measure the time between step 3 and step 4.

The referred test procedure should be performed for several times and then treated statistically. This is important to guarantee results accuracy.

Expected behaviour
The UE shall be able to, in average, hang up data call and lose network connectivity within a reasonable period of time.

23.9.3   Throughput Measure - Downlink FTP for CS RABs

Description
Measure the average downlink throughput for the defined CS RABs.

Related 3GPP core specifications
3GPP TS 22.002

Reason for test
Obtain a measure of average downlink throughput for each RAB.

Initial configuration
The UE is IMSI attached in its 3G HPLMN.
The UE has a CS modem data call already active by means of an externally initiated CS data session.

Test procedure
1. Verify that an externally initiated CS data session is already established.
2. Start an FTP download. Use a file larger than 5Mbytes.
3. Measure the throughput using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to CS RAB used.
23.9.4 Throughput Measure – Uplink FTP for CS RABs

Description
Measure the average uplink throughput for the defined CS RABs.

Related core specifications
3GPP TS 22.002

Reason for test
Obtain a measure of average uplink throughput for each RAB.

Initial configuration
The UE is IMSI attached in its 3G HPLMN.
The UE has a CS modem data call already active by means of an externally initiated CS data session.

Test procedure
1. Verify that an externally initiated CS data session is already established.
2. Start an FTP upload. Use a file larger than 5Mbytes.
3. Measure the throughput using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to CS RAB used.

23.10 Channel Type Switching

23.10.1 CELL_DCH to CELL_FACH

Description
This test describes the test method for testing channel type switching from CELL_DCH to CELL_FACH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on Iub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time of inactivity (N seconds) till the network changes the state to CELL_FACH.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch to CELL_FACH and back to CELL_DCH

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN. A PDP context is active either by using the WAP browser or by an externally initiated packet data session.

Test procedure
1. Data transfer is started and the network moves the device to CELL_DCH. When there is no monitor the data rate is checked.
2. Data transfer is ended. When an externally initiated packet data session from a PC is used a personal firewall is used to block outgoing data transfer sent from the operating system.
3. When the device is in CELL_FACH firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour
1. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.
2. The device is moved to CELL_FACH. When there is no monitor it shall be assumed that the device is moved to CELL_FACH after N seconds of inactivity.

3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

23.10.2 CELL_FACH to CELL_PCH

Description
This test describes the test method for testing channel type switching from CELL_FACH to CELL_PCH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on Iub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time of inactivity (M seconds) till the network changes the state from CELL_FACH to CELL_PCH.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch from CELL_FACH to CELL_PCH and back to CELL_DCH

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH.

Test procedure
1. It is checked that the device is in Cell_FACH.
2. No further data transfer is activated for at least M seconds. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transfer sent from the operating system.
3. When the device is in CELL_PCH firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour
1. The device is moved to CELL_FACH. When there is no monitor it shall be assumed that the device is moved to CELL_FACH after N seconds of inactivity, as indicated by the operator (see test case 23.10.1).
2. M seconds after entering CELL_FACH state the device is moved to CELL_PCH. When there is no monitor it shall be assumed that the device is moved to CELL_PCH M seconds after entering CELL_FACH.
3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

23.10.3 CELL_PCH to URA_PCH

Note: Transition from CELL_PCH to URA_PCH always requires an intermediary Signalling Channel in CELL_FACH or CELL_DCH state.

Description
This test describes the test method for testing channel type switching from CELL_PCH to URA_PCH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on lub is recommended when there is no monitor on the device. If both is not the case the test cannot be performed at all. In all cases information from the operator is provided how the device can be moved to URA_PCH.
Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch from CELL_PCH to URA_PCH and back to CELL_DCH

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH and subsequent into CELL_PCH state.

Test procedure
1. It is checked that the device is in Cell_PCH.
2. Now the device is moved to URA_PCH using the method indicated by the operator. No data transfer is sent. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transfer sent from the operating system.
3. When the device is in URA_PCH firewall blocking is disabled and data transfer is started again.

Expected behaviour
1. The device is moved to CELL_PCH.
2. With the monitor on the device or on the Iub trace tool it is checked that the device is moved to URA_PCH via CELL_FACH or CELL_DCH state.
3. The device is moved to CELL_DCH.

23.10.4 CELL_PCH to RRC idle

Note: Transition from CELL_PCH to RRC idle always requires an intermediary Signalling Channel in CELL_FACH or CELL_DCH state.

Description
This test describes the test method for testing channel type switching from CELL_PCH to RRC idle mode and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on lub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time period of inactivity (between P and Q minutes) till the network changes the state from CELL_PCH to RRC idle. This test may be tested on a test bed rather than the network as the time for moving the device can be set to a much lower value than in the field.

This test requires the 3G network supports CELL_PCH.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch from CELL_PCH to RRC idle and back to CELL_DCH

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH (if supported) and subsequent into CELL_PCH state. If an externally initiated packet data session was used it is recommended to block outgoing traffic using a personal firewall after the stop of data transfer.

Test procedure
1. It is checked that the device is in Cell_PCH.
2. No data transfer is activated. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transfer sent from the operating system.

3. When the device is in RRC idle firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour

1. The device is moved to CELL_PCH. When there is no monitor it shall be assumed that the device is moved to CELL_PCH after N+M seconds of inactivity, as indicated by the operator (see test case 23.10.1 and 23.10.2).

2. Between P and Q minutes after entering CELL_PCH state the device is moved to RRC idle state. When there is no monitor it shall be assumed that the device is moved to RRC idle Q minutes after entering CELL_PCH.

3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

24 MULTICALL and MULTI RAB CS-PS

24.1 Voice call & CS-data call

Description

The UE and the network should perform a Multicall as expected.

Related core specifications

3GPP TS 22.135

Reason for test

To ensure that the Multicall is performed as expected.

Initial configuration

The UE is switched on in UTRAN environment with sufficient FDD coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.

Test procedure

Make a Voice and CS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the speech call success and the quality is undisturbed. In data call, download a large file (e.g. with FTP) parallel with speech. Monitor the data flow with suitable software.

End the first call according to the table’s column “End First”. Ensure that the remaining call is not disturbed.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO Voice call</td>
<td>MO CS-data call</td>
<td>Voice call</td>
</tr>
<tr>
<td>B</td>
<td>MO Voice call</td>
<td>MT CS-data call</td>
<td>Voice call</td>
</tr>
<tr>
<td>C</td>
<td>MO CS-data call</td>
<td>MO Voice call</td>
<td>CS-data call</td>
</tr>
<tr>
<td>D</td>
<td>MO CS-data call</td>
<td>MT Voice call</td>
<td>CS-data call</td>
</tr>
</tbody>
</table>

Expected behaviour

The speech call continues and the speech quality is undisturbed.

The CS-data call continues and the data stream is not interrupted.
After ending the other call, the first call continues and works normally.

### 24.2 Voice call & PS-data call

**Description**
The UE and the network should perform a MultiRAB scenario as expected.

**Related core specifications**
3GPP TS 34.108 and 3GPP TS 25.331

**Reason for test**
To ensure that the MultiRAB scenario is performed as expected.

**Initial configuration**
The UE is switched on in UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.

**Test procedure**
Make a Voice and PS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the speech call success and the quality is undisturbed. In data call, download a large file (e.g. with FTP) parallel with speech. Monitor the data flow with suitable software.

End the first call according to the table’s column “End First”. Ensure that the remaining call is not disturbed.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO Voice call</td>
<td>MO PS-data call</td>
<td>Voice call</td>
</tr>
<tr>
<td>B</td>
<td>MO PS-data call</td>
<td>MO Voice call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>C</td>
<td>MO PS-data call</td>
<td>MT Voice call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>D</td>
<td>MO PS-data call</td>
<td>MT Voice call</td>
<td>Voice call</td>
</tr>
</tbody>
</table>

**Expected behaviour**
The speech call continues and the speech quality is undisturbed.
The PS-data call continues and the data stream is not interrupted.

After ending the other call, the first call continues and works normally.

### 24.3 CS data call & PS-data call

**Description**
The UE and the network should perform a MultiRAB scenario as expected.

**Related core specifications**
3GPP TS 34.108 and 3GPP TS 25.331

**Reason for test**
To ensure that the MultiRAB scenario is performed as expected.

**Initial configuration**
The UE is switched on in UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.
Test procedure
Make a CS and PS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the data calls succeed. In both connections, download a large file (e.g. with FTP) parallel. Monitor the data flows with suitable software and ensure that the data streams are not interrupted.

End the first call according to the table’s column “End First”. Ensure that the remaining call is not disturbed.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO CS-data call</td>
<td>MO PS-data call</td>
<td>CS-data call</td>
</tr>
<tr>
<td>B</td>
<td>MO PS-data call</td>
<td>MO CS-data call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>C</td>
<td>MO PS-data call</td>
<td>MT CS-data call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>D</td>
<td>MO PS-data call</td>
<td>MT CS-data call</td>
<td>CS-data call</td>
</tr>
</tbody>
</table>

Expected behaviour
The CS-data call continues and the data stream is not interrupted.
The PS-data call continues and the data stream is not interrupted.
After ending the other call, the first call continues and works normally.

24.4 Video call & PS-data call

Description
The UE and the network should perform a MultiRAB scenario as expected.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
To ensure that the MultiRAB scenario is performed as expected.

Initial configuration
The UE is switched on in UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.

Test procedure
Make a Video and PS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the Video call success and the quality is undisturbed. In data call, download a large file (e.g. with FTP) parallel with Video call. Monitor the data flow with suitable software.

End the first call according to the table’s column “End First”. Ensure that the remaining call is not disturbed.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO Video call</td>
<td>MO PS-data call</td>
<td>Video call</td>
</tr>
<tr>
<td>B</td>
<td>MO PS-data call</td>
<td>MO Video call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>C</td>
<td>MO PS-data call</td>
<td>MT Video call</td>
<td>PS-data call</td>
</tr>
<tr>
<td>D</td>
<td>MO PS-data call</td>
<td>MT Video call</td>
<td>Video call</td>
</tr>
</tbody>
</table>
Expected behaviour
The Video call continues and the quality is undisturbed.
The PS-data call continues and the data stream is not interrupted.
After ending the other call, the first call continues and works normally.

24.5 PS-data call & PS services

Description
The UE and the network should perform a PS RABs as expected.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
To ensure that the PS RABs are performed as expected.

Initial configuration
The UE is switched on in UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

Test procedure

Scenario A
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), make & send a mobile originated MMS.

Scenario B
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), receive a mobile terminated MMS.

Scenario C
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), make & send a mobile originated SMS.

Scenario D
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), receive a mobile terminated SMS.

Scenario E
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), use terminals own email client to retrieve emails.

Scenario F
Make a PS-data call with 3G terminal. While downloading a large file (e.g. with FTP), use terminals own browser to download web page.

Expected behaviour
The PS-data call continues and the data stream is not interrupted.
A. Sending a MMS succeed.
B. Receiving a MMS succeed.
C. Sending a SMS succeed.
D. Receiving a SMS succeed.
E. Retrieving emails succeed while downloading.
F. Browsing succeed while downloading.
24.6 Multi RAB CS-PS Throughput Measure

24.6.1 Downlink FTP Throughput for PS RAB

Description
Measure the average PS downlink throughput for the defined RABs during the simultaneous CS and PS calls.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average downlink throughput for each RAB.
Make sure that the PS throughput is in reasonable level while simultaneous CS and PS call.

Initial configuration
The UE is switched on in UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

Test procedure
Scenario A
Make a Voice call and a PS-data call with 3G terminal. Download a large file (e.g. with FTP) and measure the throughput using a suitable application.

Scenario B
Make a Video call and a PS-data call with 3G terminal. Download a large file (e.g. with FTP) and measure the throughput using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to PS RAB used.

24.6.2 Uplink FTP Throughput for PS RAB

Description
Measure the average PS uplink throughput for the defined RABs during the simultaneous CS and PS calls.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average uplink throughput for the PS RABs.

Initial configuration
The UE is switched on in UTRAN environment with sufficient FDD coverage, so no cell reselection to GSM is performed.

Test procedure
Scenario A
Make a Voice call and a PS-data call with 3G terminal. Upload a large file (e.g. with FTP) and measure the throughput using a suitable application.

Scenario B
Make a Video call and a PS-data call with 3G terminal. Upload a large file (e.g. with FTP) and measure the throughput using a suitable application.

Expected behaviour
The UE shall be able to present average throughput values proportional to PS RAB used.
25 HSPA

The following test cases shall be completed for terminals that support HSDPA, HSUPA (EUL) or a combination of the two.

25.1 Basic HSPA Tests

25.1.1 Ping a Remote Destination

Description
The UE pings a known IP address on a HSPA enabled cell during a packet data session.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to send a ping to a known IP address using an HSPA PS bearer on a HSPA enabled cell.

Initial configuration
The UE is IMSI attached and PS attached on a HSPA enabled 3G cell in its 3G HPLMN and a PDP context is active.

Test procedure
1. Verify that a packet data session is already established.
2. Start a ping procedure. (e.g. Ping –t [-l size] [-w timeout] destination, for e.g. ping –t –l 100 –w 1000 10.11.26.52).
3. Verify that the replies from the ping commands are correctly received.
4. Stop the ping command, e.g. use “CTRL” + “C” keys to stop ping procedure.

Expected behaviour
The UE shall be able to ping the known IP address.
Use of an HSPA bearer shall be verified by appropriate logging tools (where possible).

25.1.2 Browse Through HTML Page

Description
The UE browses through HTML pages during a packet data session, in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to browse through HTML pages with a reasonable performance on a HSPA PS bearer on a HSPA enabled cell.

Initial configuration
The UE is IMSI attached and PS attached on a HSPA enabled cell in its 3G HPLMN and a PDP context active.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Open a web site and browse through it for a while. Verify usual functionalities and qualitative performance.
Expected behaviour
The UE shall be able to open and browse through HTML pages.
Use of an HSPA bearer shall be verified by appropriate logging tools (where possible).

25.1.3 FTP Downlink

Description
The UE performs a downlink FTP transmission during a data session in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to perform an FTP download an HSPA PS bearer on an HSPA enabled 3G cell.

Initial configuration
The UE is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN and a PDP context active.

Test procedure
1. Verify that a packet data session is already established.
2. Connect to a known FTP Server (e.g. ftp.3gpp.org ) using an FTP client or using DOS command (ftp ftp.3gpp.org)
3. Download a file.

Expected behaviour
The UE shall be able to connect to the FTP server and successfully download a file.
Use of an HSPA bearer shall be verified by appropriate logging tools (where possible).

25.1.4 FTP Uplink

Description
The UE performs an uplink FTP data transfer during a packet data session in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to perform an FTP upload in a HSPA PS bearer on an HSPA enabled 3G cell.

Initial configuration
The UE is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN and a PDP context active.

Test procedure
1. Verify that a packet data session is already established.
2. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload contents.

Expected behaviour
The UE shall be able to connect to the FTP server and successfully upload a file.
Use of an HSPA bearer shall be verified by appropriate logging tools (where possible).

25.1.5 Simultaneous FTP downlink and FTP Uplink

Description
The UE performs an uplink FTP data transfer and a simultaneous downlink FTP data transfer in order to verify functionality and performance.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure that the UE is able to perform an FTP upload and FTP download in an HSPA PS bearer on an HSPA enabled 3G cell.

Initial configuration
The UE is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN and a PDP context active.

Test procedure
1. Verify that a packet data session is already established.
2. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload contents.
3. Open another FTP connection.
5. Download another file

NOTE: The TCP RX window size of both the laptop and FTP server shall be set appropriately so that optimum simultaneous Uplink and Downlink performance is achieved. If the TCP RX window size of the FTP server cannot be set to an optimum configuration by the tester, then UDP protocol may be utilised to perform this test case.

Expected behaviour
The UE shall be able to connect to the FTP server and successfully upload a file and download the files simultaneously.

Use of an HSPA bearer shall be verified by appropriate logging tools (where possible).

25.2 HSPA PS Performance

25.2.1 Delay HTML (web page size / number of elements)

Description
Measure the time the UE takes to correctly download and render a Web page containing pictures, text and CSS formatting on an HSPA enabled 3G cell.

This test is possible with UE support HTML format. Alternatively, if the browsing embedded application doesn’t support HTML format, the download can be performed from an external device (e.g. a laptop) tethered to the UE.

Related core specifications
3GPP TS 24.008, section 6.1.3.1.1 (Successful PDP context activation initiated by the mobile station)

Reason for test
To ensure that the UE guarantees an acceptable performance in case of repeated downloads of small size files, such as HTML web pages, on an HSPA enabled 3G cell.
Two test procedures are defined, one to give an indication of the download speed and one to give an indication of the download speed and the time taken to perform the FACH to DCH state transition.

**Initial configuration**

The UE is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN

The UE has a PDP context already active by means of internal browsing application or, alternatively, by means of an external device.

**Test procedure(s)**

1. Manage on the UE (or on the external device) to download the same reference web page rapidly 10 times in a row. (Ensure that the page is downloaded from the network each time and not just loaded from the browser cache)

2. Verify than the download of the page is correct each time (number of elements)

3. Measure the time to download the 10 WEB pages and calculate the average download time per page.

4. Manage on the UE (or on the external device) to download the same reference web page 10 times in a row leaving a 30 second pause between each download. (Ensure that the page is downloaded from the network each time and not just loaded from the browser cache)

5. Verify than the download of the page is correct each time (number of elements)

6. Measure the time to download the 10 WEB pages and calculate the average download time per page.

**Expected behaviour**

The UE shall be able to, on average, to download a reference Web page within a reasonable period of time when compared to other HSPA capable UE's on the same network.

25.2.2 Throughput Measure – Downlink FTP for HSPA PS RAB

25.2.2.1 Relative Throughput Measure – Downlink FTP for HSPA PS RAB

**NOTE:** This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

**Description**

Measure the average downlink throughput for a HSPA RAB.

**Related core specifications**

3GPP TS 25.331

**Reason for test**

Obtain a measure of average downlink throughput for a HSPA RAB.

**Initial configuration**

Use a commercially available reference device which is HSPA capable for comparison. HSPA capabilities in downlink and uplink of this device should be identical with the DUT.

Connect both, DUT and reference device to two different laptops with identical configuration and use them as modems for the laptops. Ensure that the Connection Manager from the device supplier is used. Where possible, Handsets shall be connected via USB.

Both, the device under test (DUT) and the reference device are IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN.

The UEs have a PDP context already active.

**Test procedure**

1. Verify that a packet data session is already established for the reference device.
2. Start an FTP/TFTP download for the reference device using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. If possible, utilize a server with minimal latency to the GGSN.

3. Measure the average throughput using a suitable application.

4. Repeat steps from 1 to 3 for the DUT.

5. Perform 10 times the steps from 1 to 4, selecting the best result for both DUT and reference device.

**Expected behaviour**

The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the HSPA capability of the device and the HSPA RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the HSPA capability of the devices. If the reference device can’t reach the Minimum Realistic Throughput although good efforts have been undertaken to identify a suitable test environment then the test case shall be marked as non-executable due to network performance limitations.

<table>
<thead>
<tr>
<th>Downlink HSPA / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306 &amp; 3GPP 25.825)</th>
<th>Minimum Realistic Throughput in field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 23,24 (64 QAM+DC-HSDPA)</td>
<td>43.2 Mbit/s</td>
<td>23 Mbit/s</td>
</tr>
<tr>
<td>Cat 21,22 (16 QAM+DC-HSDPA)</td>
<td>28.8 Mbit/s</td>
<td>15 Mbit/s</td>
</tr>
<tr>
<td>Cat 14 &amp; 18 (MIMO)</td>
<td>21.6 Mbit/s</td>
<td>13 Mbit/s</td>
</tr>
<tr>
<td>Cat 10</td>
<td>14.4 Mbit/s</td>
<td>9 Mbit/s</td>
</tr>
<tr>
<td>Cat 9</td>
<td>10.2 Mbit/s</td>
<td>7 Mbit/s</td>
</tr>
<tr>
<td>Cat 8</td>
<td>7.21 Mbit/s</td>
<td>4.8 Mbit/s</td>
</tr>
<tr>
<td>Cat 6</td>
<td>3.65 Mbit/s</td>
<td>2.8 Mbit/s</td>
</tr>
<tr>
<td>Cat 12</td>
<td>1.8 Mbit/s</td>
<td>1.4 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>350 kbit/s</td>
</tr>
</tbody>
</table>

25.2.2.2 Absolute Throughput Measure – Downlink FTP for HSPA PS RAB

**NOTE:** This test needs to be conducted under lab conditions (optimum RF signal, no contention with other UEs, sufficient bandwidth of NodeB).

**Description**

Measure the average downlink throughput for a HSPA RAB.

**Related 3GPP core specifications**

3GPP TS 25.306, TS 25.331

**Reason for test**

Obtain a measure of average downlink throughput for a HSPA RAB.

**Initial configuration**

Check the Lab Environment with a Reference Device (recommended by an Operator) to ensure that the Minimum Realistic Throughput Values can be achieved.

Connect the DUT to a PC and use it as a modem. Ensure that the Connection Manager from the device supplier is used. Where possible, the DUT shall be connected via USB.

The device under test (DUT) is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN.
The UE has a PDP context already active.

**Test procedure**

1. Verify that a packet data session is already established for the DUT.
2. Start an FTP/TFTP download for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. Utilize a server with minimal latency to the GGSN.
3. Measure the average throughput on FTP/TFTP level using a suitable application.
4. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

**Expected behaviour**

The best result on DUT shall be proportional to the HSPA capability of the device and the HSPA RAB available of the cell used. The following minimum values are to be fulfilled:

<table>
<thead>
<tr>
<th>Downlink HSPA / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306 &amp; 3GPP 25.825)</th>
<th>Minimum Realistic Throughput in Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 23 &amp; 24 (64 QAM+DC-HSDPA)</td>
<td>43.2 Mbit/s</td>
<td>37.5 Mbit/s</td>
</tr>
<tr>
<td>Cat 21 &amp; 22 (16 QAM+DC-HSDPA)</td>
<td>28.8 Mbit/s</td>
<td>[TBD] Mbit/s</td>
</tr>
<tr>
<td>Cat 16 &amp; 18 (MIMO)</td>
<td>28.8 Mbit/s</td>
<td>24.7 Mbit/s</td>
</tr>
<tr>
<td>Cat 14 &amp; 18 (no MIMO)</td>
<td>21.6 Mbit/s</td>
<td>18.4 Mbit/s</td>
</tr>
<tr>
<td>Cat 10</td>
<td>14.4 Mbit/s</td>
<td>12.2 Mbit/s</td>
</tr>
<tr>
<td>Cat 9</td>
<td>10.2 Mbit/s</td>
<td>8.9 Mbit/s</td>
</tr>
<tr>
<td>Cat 8</td>
<td>7.21 Mbit/s</td>
<td>6.2 Mbit/s</td>
</tr>
<tr>
<td>Cat 6</td>
<td>3.65 Mbit/s</td>
<td>3.1 Mbit/s</td>
</tr>
<tr>
<td>Cat 4</td>
<td>1.8 Mbit/s</td>
<td>1.5 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>380 kbit/s</td>
</tr>
</tbody>
</table>

Report the obtained throughput value for DUT.

**25.2.3 Throughput Measure – Uplink FTP for HSPA PS RAB**

**25.2.3.1 Relative Throughput Measure – Uplink FTP for HSPA PS RAB**

*NOTE:* This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

**Description**

Measure the average uplink throughput for the handset on an HSPA enabled cell.

**Related core specifications**

3GPP TS 25.331

**Reason for test**

Obtain a measure of average uplink throughput in case of HSPA.

**Initial configuration**

Use a commercially available reference device from a different vendor which is HSPA capable for comparison. HSPA and UL capability of this device should be identical with DUT.

Connect both, DUT and reference device to two different laptops with identical configuration and use them as modems for the laptops. Ensure that the Connection Manager from the device supplier is used. Where possible, Handsets shall be connected via USB.

Both, the device under test (DUT) and the reference device are IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN.

The UE is IMSI attached and PS attached on an HSPA enabled cell in its 3G HPLMN.
Either the UE or the network do not support EUL
The UEs have a PDP context already active.

Test procedure
1. Verify that a packet data session is already established for the reference device.
2. Start an FTP/TFTP upload for the reference device using the HSPA UL RAB. Use an uncompressible file larger than 20 Mbytes. If possible, utilize a server with minimal latency to the GGSN.
3. Measure the average throughput using a suitable application.
4. Repeat steps from 1 to 3 for the DUT.
5. Perform 10 times the steps from 1 to 4, selecting the best result for both DUT and reference device.

Expected behaviour
The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the UL capability of the device and the UL RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the HSPA capability of the devices. If the reference device can’t reach the Minimum Realistic Throughput although good efforts have been undertaken to identify a suitable test environment then the test case shall be marked as non-executable due to network performance limitations.

<table>
<thead>
<tr>
<th>Uplink RAB</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306)</th>
<th>Minimum Realistic Throughput in field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 6</td>
<td>5.7 Mbit/s</td>
<td>3.3 Mbit/s</td>
</tr>
<tr>
<td>Cat 5</td>
<td>2 Mbit/s</td>
<td>1.4 Mbit/s</td>
</tr>
<tr>
<td>Cat 3</td>
<td>1.45 Mbit/s</td>
<td>1.0 Mbit/s</td>
</tr>
<tr>
<td>R99 384</td>
<td>384 kbit/s</td>
<td>350 kbit/s</td>
</tr>
</tbody>
</table>

25.2.3.2 Absolute Throughput Measure – Uplink FTP for HSPA PS RAB

NOTE: This test needs to be conducted under lab conditions (optimum RF signal, no contention with other UEs, sufficient bandwidth of NodeB).

Description
Measure the average uplink throughput for an HSPA PS RAB.

Related 3GPP core specifications
3GPP TS 25.331

Reason for test
Obtain a measure of average uplink throughput for an HSPA PS RAB.

Make sure that the PS throughput is on appropriate level while simultaneous CS and PS call.

Initial configuration
Check the Lab Environment with a Reference Device (recommended by an Operator) to ensure that the Minimum Realistic Throughput Values can be achieved.

Connect the DUT to a PC and use it as a modem. Ensure that the Connection Manager from the device supplier is used. Where possible, the DUT shall be connected via USB.

The device under test (DUT) is IMSI attached and PS attached on an EUL enabled 3G cell in its 3G HPLMN.

The UE has a PDP context already active by means of an externally initiated packet data session.
Test procedure

1. Verify that an externally initiated packet data session is already established for the DUT.
2. Start an FTP/TFTP upload for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes. Utilize a server with minimal latency to the GGSN.
3. Measure the average throughput on FTP/TFTP level using a suitable application.
4. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

Expected behaviour

The best result on DUT shall be proportional to the HSPA capability of the device and the HSPA PS RAB available of the cell used. The following minimum values are to be fulfilled:

<table>
<thead>
<tr>
<th>Uplink EUL / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306)</th>
<th>Minimum Realistic Throughput in Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 6</td>
<td>5.7 Mbit/s</td>
<td>3.9 Mbit/s</td>
</tr>
<tr>
<td>Cat 5</td>
<td>2 Mbit/s</td>
<td>1.8 Mbit/s</td>
</tr>
<tr>
<td>Cat 3</td>
<td>1.45 Mbit/s</td>
<td>1.2 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>370 kbit/s</td>
</tr>
</tbody>
</table>

Report the obtained throughput value for DUT.

25.2.4 Relative Simultaneous Throughput Measure – Uplink and Downlink FTP for HSPA PS RAB

NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

Description

Measure the average simultaneous uplink and downlink throughput for the handset on an HSPA enabled cell.

Related core specifications

3GPP TS 25.331

Reason for test

Obtain a measure of average simultaneous uplink and downlink uplink throughput for the HSPA uplink RAB.

Initial configuration

The UE is IMSI attached and PS attached on an HSPA enabled cell in its 3G HPLMN

The UE has a PDP context already active.

Test procedure

1. Verify that a packet data session is already established.
2. Start an FTP/TFTP download. Use an uncompressible file larger than 20 Mbytes.
3. Simultaneously start an FTP/TFTP upload. Use an uncompressible file larger than 5 Mbytes.
4. Measure the throughput of both the upload and download using a suitable application.

NOTE: The TCP RX window size of both the laptop and FTP server shall be set appropriately so that optimum simultaneous Uplink and Downlink performance is achieved. If the TCP RX window size of the FTP server cannot be set to an optimum configuration by the tester, then UDP protocol may be utilised to perform this test case.

Expected behaviour

The UE shall be able to present average throughput values proportional to the HSPA capability of the device and the HSPA uplink RAB enabled for the cell.
25.3 HSPA MultiRAB

25.3.1 Voice call & HSPA PS data call

Description
The UE and the network should perform a MultiRAB as expected.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
To ensure that the MultiRAB is performed as expected.

Initial configuration
The UE is switched on in HSPA enabled UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.

Test procedure
Make a Voice and HSPA PS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the speech call success and the quality is undisturbed. In data call, download a large file (e.g. with FTP) parallel with speech. Monitor the data flow with suitable software.

End the first call according to the table's column “End First”. Ensure that the remaining call is not disturbed. Afterwards, repeat the procedure while uploading a large file (e.g. with FTP) in parallel with the speech call.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO Voice call</td>
<td>MO PS-data call</td>
<td>Voice call</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1st run: download</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd run: upload</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>MO PS-data call</td>
<td>MO Voice call</td>
<td>PS-data call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>MO PS-data call</td>
<td>MT Voice call</td>
<td>PS-data call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>MO PS-data call</td>
<td>MT Voice call</td>
<td>Voice call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Ensure that when the “second call” is initiated that the PS data call is not reconfigured or downgraded to a R99 bearer (depending on network support).

Expected behaviour
The speech call continues and the speech quality is undisturbed.

The HSPA PS-data call continues and the data stream is not interrupted.

After ending the other call, the first call continues and works normally.
25.3.2 Video call & HSPA PS data call

Description
The UE and the network should perform a MultiRAB as expected.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
To ensure that the MultiRAB is performed as expected.

Initial configuration
The UE is switched on in HSPA enabled UTRAN environment with sufficient coverage, so no cell reselection to GSM is performed.

To perform this test case properly, suitable Monitor software is needed.

Test procedure
Make a Video and HSPA PS-data calls with 3G Terminal according to the table below. The first call is mobile originated call. The second call is either mobile originated call or mobile terminated call.

Ensure that the Video call success and the quality is undisturbed. In data call, download a large file (e.g. with FTP) parallel with Video call. Monitor the data flow with suitable software.

End the first call according to the table’s column “End First”. Ensure that the remaining call is not disturbed. Afterward, repeat the procedure while uploading a large file (e.g. with FTP) in parallel with the speech call.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First Call</th>
<th>Second Call</th>
<th>End First</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MO Video call</td>
<td>MO PS-data call</td>
<td>Video call</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1st run: download</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd run: upload</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>MO PS-data call</td>
<td>MO Video call</td>
<td>PS-data call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>MO PS-data call</td>
<td>MT Video call</td>
<td>PS-data call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>MO PS-data call</td>
<td>MT Video call</td>
<td>Video call</td>
</tr>
<tr>
<td></td>
<td>1st run: download</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd run: upload</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Ensure that when the “second call” is initiated that the PS data call is not reconfigured or downgraded to a R99 bearer (depending on network support).

Expected behaviour
The Video call continues and the quality is undisturbed.

The HSPA PS-data call continues and the data stream is not interrupted.

After ending the other call, the first call continues and works normally.

25.3.3 HSPA, Simultaneous PS Services

Description
The DUT and the network should perform as expected using the HSPA RAB.
Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
To ensure that different PS services use the HSPA RAB simultaneously as expected.

Initial configuration
DUT is switched on in HSPA enabled UTRAN environment.
APNs for different services are configured according to the network default.
Client 1 – Attached to same PLMN as DUT.

Test procedure
1. DUT is in a PS data session (DUN / Tethered)
2. Download a large file (e.g. with FTP)
   
   Scenario A
   Receive an MT MMS from Client 1.

   Scenario B
   Retrieve an Email using DUT’s email application.

   Scenario C
   Open Internal Browser and load a content rich page.

   Expected behaviour
   A. Data download continues while the MMS is received.
   B. Data download continues while the Email is retrieved.
   C. Data download continues while Internal Browser Page is loaded.

25.3.4 Downlink FTP Throughput for HSPA PS RAB during MultiRAB

25.3.4.1 Relative Downlink FTP Throughput for HSPA PS RAB during MultiRAB

   NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

Description
Measure the average PS downlink throughput for a HSPA RAB during the simultaneous CS and PS calls.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average downlink throughput for the HSPA RAB.
Make sure that the PS throughput is in reasonable level while simultaneous CS and PS call.

Initial configuration
Use a commercially available reference device from a different vendor which is HSPA capable for comparison. HSPA capability and UL capability of this device should be identical with DUT.

Connect both, DUT and reference device to two different laptops with identical configuration and use them as modems for the laptops. Ensure that the Connection Manager from the device supplier is used. Where possible, Handsets shall be connected via USB.

Both, the device under test (DUT) and the reference device are IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN.
The UEs have a PDP context already active.

**Test procedure**

Verify that a packet data session is already established for the reference device.

**Scenario A:**

1. Make a voice call and start an FTP/TFTP download for the reference device using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. If possible, utilize a server with minimal latency to the GGSN.
2. Measure the average throughput using a suitable application.
3. Repeat steps from 1 to 3 for the DUT
4. Perform 10 times the steps from 1 to 4, selecting the best result for both DUT and reference device.

**Scenario B**

1. Make a video call and start an FTP/TFTP download for the reference device using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. If possible, utilize a server with minimal latency to the GGSN.
2. Measure the average throughput using a suitable application.
3. Repeat steps from 1 to 3 for the DUT
4. Perform 10 times the steps from 1 to 4, selecting the best result for both DUT and reference device.

**Expected behaviour**

The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the HSPA capability of the device and the HSPA RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the HSPA capability of the devices. If the reference device can’t reach the Minimum Realistic Throughput although good efforts have been undertaken to identify a suitable test environment then the test case shall be marked as non-executable due to network performance limitations.

<table>
<thead>
<tr>
<th>Downlink HSPA / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306 &amp; 3GPP 25.825)</th>
<th>Minimum Realistic Throughput in field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 23 &amp; 24 (64 QAM+DC-HSDPA)</td>
<td>43.2 Mbit/s</td>
<td>23 Mbit/s</td>
</tr>
<tr>
<td>Cat 21 &amp; 22 (16 QAM+DC-HSDPA)</td>
<td>28.8 Mbit/s</td>
<td>15 Mbit/s</td>
</tr>
<tr>
<td>Cat 16 &amp; 18 (MIMO)</td>
<td>28.8 Mbit/s</td>
<td>15 Mbit/s</td>
</tr>
<tr>
<td>Cat 14 &amp; 18 (no MIMO)</td>
<td>21.6 Mbit/s</td>
<td>13 Mbit/s</td>
</tr>
<tr>
<td>Cat 10</td>
<td>14.4 Mbit/s</td>
<td>9 Mbit/s</td>
</tr>
<tr>
<td>Cat 9</td>
<td>10.2 Mbit/s</td>
<td>7 Mbit/s</td>
</tr>
<tr>
<td>Cat 8</td>
<td>7.21 Mbit/s</td>
<td>4.8 Mbit/s</td>
</tr>
<tr>
<td>Cat 6</td>
<td>3.65 Mbit/s</td>
<td>2.8 Mbit/s</td>
</tr>
<tr>
<td>Cat 12</td>
<td>1.8 Mbit/s</td>
<td>1.4 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>350 kbit/s</td>
</tr>
</tbody>
</table>

**25.3.4.2 Absolute Downlink FTP Throughput for HSPA PS RAB during MultiRAB**

**NOTE:** This test needs to be conducted under lab conditions (optimum RF signal, no contention with other UEs, sufficient bandwidth of NodeB).
Description
Measure the average PS downlink throughput for a HSPA RAB during the simultaneous CS and PS calls.

Related 3GPP core specifications
3GPP TS 34.108, TS 25.331

Reason for test
Obtain a measure of average downlink throughput for the HSPA RAB.
Make sure that the PS throughput is on appropriate level while simultaneous CS and PS call.

Initial configuration
Check the Lab Environment with a Reference Device (recommended by an Operator) to ensure that the Minimum Realistic Throughput Values can be achieved.

Connect the DUT to a PC and use it as a modem. Ensure that the Connection Manager from the device supplier is used. Where possible, the DUT shall be connected via USB.

The device under test (DUT) is IMSI attached and PS attached on an HSPA enabled 3G cell in its 3G HPLMN.
The UE has a PDP context already active.

Test procedure
Verify that a packet data session is already established for the DUT.

Scenario A
1. Make a voice call and start an FTP/TFTP download for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. Utilize a server with minimal latency to the GGSN.
2. Measure the average throughput on FTP/TFTP level using a suitable application.
3. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

Scenario B
1. Make a video call and start an FTP/TFTP download for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes up to cat 8 and larger than 50 Mbytes for cat 9 and higher. Utilize a server with minimal latency to the GGSN.
2. Measure the average throughput on FTP/TFTP level using a suitable application.
3. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

Expected behaviour
The best result on DUT shall be proportional to the HSPA capability of the device and the HSPA RAB available of the cell used. The following minimum values are to be fulfilled:

<table>
<thead>
<tr>
<th>Downlink HSPA / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306 &amp; 3GPP 25.825)</th>
<th>Minimum Realistic Throughput in Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 23 &amp; 24 (64 QAM+DC-HSDPA)</td>
<td>43.2 Mbit/s</td>
<td>[TBD] Mbit/s</td>
</tr>
<tr>
<td>Cat 21 &amp; 22 (16 QAM+DC-HSDPA)</td>
<td>28.8 Mbit/s</td>
<td>[TBD] Mbit/s</td>
</tr>
<tr>
<td>Cat 16 &amp; 18 (MIMO)</td>
<td>28.8 Mbit/s</td>
<td>[TBD] Mbit/s</td>
</tr>
<tr>
<td>Cat 14 &amp; 18 (no MIMO)</td>
<td>21.6 Mbit/s</td>
<td>18 (tbc) Mbit/s</td>
</tr>
<tr>
<td>Cat 10</td>
<td>14.4 Mbit/s</td>
<td>10.4 Mbit/s</td>
</tr>
<tr>
<td>Cat 9</td>
<td>10.2 Mbit/s</td>
<td>8.7 Mbit/s</td>
</tr>
<tr>
<td>Cat 8</td>
<td>7.21 Mbit/s</td>
<td>6.1 Mbit/s</td>
</tr>
<tr>
<td>Cat 6</td>
<td>3.65 Mbit/s</td>
<td>3.1 Mbit/s</td>
</tr>
<tr>
<td>Cat 4</td>
<td>1.8 Mbit/s</td>
<td>1.5 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>380 kbit/s</td>
</tr>
</tbody>
</table>
Report the obtained throughput value for DUT.

25.3.5 Uplink FTP Throughput for HSPA PS RAB during MultiRAB

25.3.5.1 Relative Uplink FTP Throughput for HSPA PS RAB during MultiRAB

NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

Description
Measure the average PS uplink throughput for the HSPA uplink RAB during the simultaneous CS and PS calls.

Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average uplink throughput for the HSPA uplink RAB.

Initial configuration
The UE is switched on in HSPA enabled UTRAN environment with sufficient FDD coverage, so no cell reselection to GSM is performed.

Test procedure
Use an uncompressible file for the data transfer.

Scenario A
Make a voice call and a HSPA data call with 3G terminal. Upload a large file (e.g. with FTP/TFTP) and measure the throughput using a suitable application.

Scenario B
Make a video call and a HSPA data call with 3G terminal. Upload a large file (e.g. with FTP/TFTP) and measure the throughput using a suitable application.

Expected behaviour
The best result on DUT shall be comparable with the best result of a reference mobile (no more than 10% worse), and shall be proportional to the EUL capability of the device and the EUL RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the HSPA capability of the devices. If the reference device can’t reach the Minimum Realistic Throughput although good efforts have been undertaken to identify a suitable test environment then the test case shall be marked as non-executable due to network performance limitations.

<table>
<thead>
<tr>
<th>Uplink EUL / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306)</th>
<th>Minimum Realistic Throughput in field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 6</td>
<td>5.7 Mbit/s</td>
<td>3.3 Mbit/s</td>
</tr>
<tr>
<td>Cat 5</td>
<td>2 Mbit/s</td>
<td>1.4 Mbit/s</td>
</tr>
<tr>
<td>Cat 3</td>
<td>1.45 Mbit/s</td>
<td>1.0 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>350 kbit/s</td>
</tr>
</tbody>
</table>

25.3.5.2 Absolute Uplink FTP Throughput for EUL PS RAB during MultiRAB

NOTE: This test needs to be conducted under lab conditions (optimum RF signal, no contention with other UEs, sufficient bandwidth of NodeB).
Description
Measure the average PS uplink throughput for the HSPA uplink RAB during the simultaneous CS and PS calls.

Related 3GPP core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average uplink throughput for an HSPA PS RAB.

Initial configuration
Check the Lab Environment with a Reference Device (recommended by an Operator) to ensure that the Minimum Realistic Throughput Values can be achieved.

Connect the DUT to a PC and use it as a modem. Ensure that the Connection Manager from the device supplier is used. Where possible, the DUT shall be connected via USB.

The device under test (DUT) is IMSI attached and PS attached on an EUL enabled 3G cell in its 3G HPLMN.

The UE has a PDP context already active.

Test procedure
Verify that an externally initiated packet data session is already established for the DUT.

Scenario A
1. Make a voice call and start an FTP/TFTP upload for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes. Utilize a server with minimal latency to the GGSN.
2. Measure the average throughput on FTP/TFTP level using a suitable application.
3. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

Scenario B
1. Make a video call and start an FTP/TFTP upload for the DUT using the HSPA RAB. Use an uncompressible file larger than 20 Mbytes. Utilize a server with minimal latency to the GGSN.
2. Measure the average throughput on FTP/TFTP level using a suitable application.
3. Perform 3 times the steps from 1 to 3, selecting the best result for the DUT.

Expected behaviour
The best result on DUT shall be proportional to the EUL capability of the device and the EUL PS RAB available of the cell used. The following minimum values are to be fulfilled:

<table>
<thead>
<tr>
<th>Uplink EUL / R99</th>
<th>Advertised Throughput FDD (ref. 3GPP 25.306)</th>
<th>Minimum Realistic Throughput in Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 6</td>
<td>5.7 Mbit/s</td>
<td>3.8 (tbc) Mbit/s</td>
</tr>
<tr>
<td>Cat 5</td>
<td>2 Mbit/s</td>
<td>1.6 Mbit/s</td>
</tr>
<tr>
<td>Cat 3</td>
<td>1.45 Mbit/s</td>
<td>1.2 Mbit/s</td>
</tr>
<tr>
<td>R99</td>
<td>384 kbit/s</td>
<td>370 kbit/s</td>
</tr>
</tbody>
</table>

Report the obtained throughput value for DUT.

25.3.6 Relative Simultaneous FTP Throughput for HSPA PS RAB during MultiRAB

NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of NodeB).

Description
Measure the average PS uplink and downlink throughput for the HSPA uplink and downlink RAB during the simultaneous CS and PS calls.
Related core specifications
3GPP TS 34.108 and 3GPP TS 25.331

Reason for test
Obtain a measure of average uplink and downlink throughput for the HSPA uplink RAB.

Initial configuration
The UE is switched on in HSPA enabled UTRAN environment with sufficient FDD coverage, so no cell reselection to GSM is performed.

Test procedure
Scenario A
1. Establish a Voice call.
2. Establish a packet data session.
4. Simultaneously start an FTP/TFTP upload. Use an uncompressible file larger than 5 Mbytes.
5. Measure the throughput of both the upload and download using a suitable application.

Scenario B
1. Establish a Video call.
2. Establish a packet data session.
4. Simultaneously start an FTP/TFTP upload. Use an uncompressible file larger than 5 Mbytes.
5. Measure the throughput of both the upload and download using a suitable application.

NOTE: The TCP RX window size of both the laptop and FTP server shall be set appropriately so that optimum simultaneous Uplink and Downlink performance is achieved. If the TCP RX window size of the FTP server cannot be set to an optimum configuration by the tester, then UDP protocol may be utilised to perform this test case.

Expected behaviour
The UE shall be able to present average throughput values proportional to the HSPA capability of the device and the HSPA downlink/uplink available on the cell used.

25.4 Channel Type Switching in HSPA cells

25.4.1 CELL_DCH to CELL_FACH

Description
This test describes the test method for testing channel type switching from CELL_DCH to CELL_FACH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on Iub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time of inactivity (N seconds) till the network changes the state to CELL_FACH.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch to CELL_FACH and back to CELL_DCH in HSPA cells

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN in a HSPA cell. A PDP context is active either by using the WAP browser or by an externally initiated packet data session.
Test procedure

1. Data transfer is started and the network moves the device to CELL_DCH. When there is no monitor the data rate is checked.

2. Data transfer is ended. When an externally initiated packet data session from a PC is used a personal firewall is used to block outgoing data transferred sent from the operating system.

3. When the device is in CELL_FACH firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour

1. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

2. The device is moved to CELL_FACH. When there is no monitor it shall be assumed that the device is moved to CELL_FACH after N seconds of inactivity.

3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

25.4.2 CELL_FACH to CELL_PCH

Description

This test describes the test method for testing channel type switching from CELL_FACH to CELL_PCH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on Iub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time of inactivity (M seconds) till the network changes the state from CELL_FACH to CELL_PCH.

Related core specifications

3GPP TS 25.331

Reason for test

To ensure the UE is able to switch from CELL_FACH to CELL_PCH and back to CELL_DCH and back to CELL_DCH in HSPA cells

Initial configuration

The UE is IMSI attached and PS attached in its 3G HPLMN in a HSPA cell. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH.

Test procedure

1. It is checked that the device is in Cell_FACH.

2. No further data transfer is activated for at least M seconds. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transferred sent from the operating system.

3. When the device is in CELL_PCH firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour

1. The device is moved to CELL_FACH. When there is no monitor it shall be assumed that the device is moved to CELL_FACH after N seconds of inactivity, as indicated by the operator (see test case 23.10.1).

2. M seconds after entering CELL_FACH state the device is moved to CELL_PCH. When there is no monitor it shall be assumed that the device is moved to CELL_PCH M seconds after entering CELL_FACH.

3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.
25.4.3 CELL_PCH to URA_PCH

NOTE: Transition from CELL_PCH to URA_PCH always requires an intermediary Signalling Channel in CELL_FACH or CELL_DCH state.

Description
This test describes the test method for testing channel type switching from CELL_PCH to URA_PCH and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on lub is recommended when there is no monitor on the device. If both is not the case the test cannot be performed at all. In all cases information from the operator is provided how the device can be moved to URA_PCH.

Related core specifications
3GPP TS 25.331

Reason for test
To ensure the UE is able to switch from CELL_PCH to URA_PCH and back to CELL_DCH in HSPA cells.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN in a HSPA cell. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH and subsequent into CELL_PCH state.

Test procedure
1. It is checked that the device is in Cell_PCH.
2. Now the device is moved to URA_PCH using the method indicated by the operator. No data transfer is sent. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transfer sent from the operating system.
3. When the device is in URA_PCH firewall blocking is disabled and data transfer is started again.

Expected behaviour
1. The device is moved to CELL_PCH.
2. With the monitor on the device or on the lub trace tool it is checked that the device is moved to URA_PCH via CELL_FACH or CELL_DCH state.
3. The device is moved to CELL_DCH.

25.4.4 CELL_PCH to RRC idle

NOTE: Transition from CELL_PCH to RRC idle always requires an intermediary Signalling Channel in CELL_FACH or CELL_DCH state.

Description
This test describes the test method for testing channel type switching from CELL_PCH to RRC idle mode and back to CELL_DCH. It is recommended to use a monitor on the device to identify the state. Test on a test bed with trace facility on lub is recommended when there is no monitor on the device. If both is not the case the test can still be performed when the operator provides information about the time period of inactivity (between P and Q minutes) till the network changes the state from CELL_PCH to RRC idle. This test may be tested on a test bed rather than the network as the time for moving the device can be set to a much lower value than in the field.

This test requires a 3G network with the a CELL_DCH -> CELL_FACH -> CELL_PCH transition.

Related core specifications
3GPP TS 25.331
Reason for test
To ensure the UE is able to switch from CELL_PCH to RRC idle and back to CELL_DCH in HSPA cells.

Initial configuration
The UE is IMSI attached and PS attached in its 3G HPLMN in a HSPA cell. A PDP context is active either by using the WAP browser or by an externally initiated packet data session. Data transfer is started and the network moves the device to CELL_DCH. Then data transfer is stopped so the network moves the device into CELL_FACH (if supported) and subsequent into CELL_PCH state. If an externally initiated packet data session was used it is recommended to block outgoing traffic using a personal firewall after the stop of data transfer.

Test procedure
1. It is checked that the device is in Cell_PCH.
2. No data transfer is activated. When an externally initiated packet data session from a PC is used the personal firewall is still blocking outgoing data transfer sent from the operating system.
3. When the device is in RRC idle firewall blocking is disabled and data transfer is started again. When there is no monitor the data rate is checked.

Expected behaviour
1. The device is moved to CELL_PCH. When there is no monitor it shall be assumed that the device is moved to CELL_PCH after N+M seconds of inactivity, as indicated by the operator (see test case 23.10.1 and 23.10.2).
2. Between P and Q minutes after entering CELL_PCH state the device is moved to RRC idle state. When there is no monitor it shall be assumed that the device is moved to RRC idle Q minutes after entering CELL_PCH.
3. The device is moved to CELL_DCH. When there is no monitor the data indicates that the device is in CELL_DCH and not in CELL_FACH.

25.4.5 Fast Dormancy with 3GPP Release 8 (or later) SCRI Message

Description
This test describes the method for testing channel type switching from Cell_DCH or Cell_FACH to Cell_PCH using the Signalling Connection Release Indication (SCRI) Message with the Release Cause set to “UE Requested PS Data Session End” as described in 3GPP TS 25.331, 8.1.14.2 (beginning with 3GPP Release 8). This method is also referred to as “Release 8 Fast Dormancy”. It is recommended to use a monitor on the device to identify the proper execution of state changes.

Related core specifications
3GPP TS 25.331

Reason for test
The test ensures that the Release 8 or later Fast Dormancy Functionality is properly implemented in the device.

Initial configuration
- Timer T323 is broadcast by the network, which indicates the support of the network for the Release Cause set to “UE Requested PS Data Session End”.
- The UE is IMSI attached and PS attached in its 3G HPLMN. A PDP context is active. No CS call is active.
- Data transfer is started and the network moves the device to CELL_DCH. Then, the data transfer is stopped.
Test procedure
Once the device's internal conditions are satisfied that there is a high likelihood of no immediate further data transfer the device sends an SCRI message with the Release Cause set to “UE Requested PS Data Session End”.

Once the device is in an energy efficient state as a result of the previous signalling exchange, move the UE to another cell in the same location and routing area and observe that the required RRC signalling depending on the new RRC state is properly performed.

While the device is in the energy efficient state, start transferring data again and ensure that the device returns to CELL_DCH state properly.

Expected behaviour
The UE follows the instructions of the network, for example, it enters Cell_PCH, URA_PCH or IDLE state.

If the network has instructed the device to enter Cell_PCH or URA_PCH state, no or no more than one further SCRI message is sent while the UE is in this state.

Once the device is in the more energy efficient state, move the device to another cell and verify that the proper RRC procedure is performed depending on the current state:

- **IDLE**: No RRC signalling is performed.
- **Cell_PCH**: A cell update procedure is performed.
- **URA_PCH**: No procedure is performed if the new cell is in the same URA. If the new cell is in a different URA, an URA update procedure is performed.

Once the device is back in an energy efficient state, ensure that once renewed data traffic occurs the device is properly transitioning back to Cell_FACH or Cell_DCH as instructed by the network.
Annex C: Detailed Test Procedures for a Single RAT / Multi RAT E-UTRA User Equipment

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT E-UTRA User Equipment.

To ensure that all features supported by the UE operating correctly on all supported frequency bands, an appropriate selection of frequency bands shall be used for the following test scenarios.

The 3GPP requirements for E-UTRA provide support for paired and unpaired spectrum, enabling a single radio-access technology that can support frequency-division duplex (FDD) as well as time-division duplex (TDD) operation.

It is expected that the lab test and field test scenarios specified in this document will be applicable for both FDD and TDD operation, unless a test case specifies TDD or FDD operation only.

30 System Access & Registration

30.1 Attach and Detach

30.1.1 Attach and Detach for EPS services

30.1.1.1 Attach

Description

The UE shall successfully perform the “EPS Attach” and “Default EPS Bearer Context Activation” procedures.

Related core specifications

3GPP TS 24.301

Reason for test

To verify, that the UE can successfully establish a default EPS bearer during the Network Attachment procedure.

Initial configuration

UE is powered off.

Test procedure

1. Power on the UE and verify that the UE initiates the Attach procedure by sending the “Attach Request” message if possible use a diagnostic tool to verify that this message contains the “PDN CONNECTIVITY REQUEST” to the eNodeB. The message may also contain the old GUTI.

2. The network shall respond to the UE with an "RRConnectionReconfiguration" [ATTACH ACCEPT] message that contains the “EPS Radio Bearer Identity” and the APN for a default bearer.

3. Verify that the UE is attached and has a default EPS bearer by setting up a mobile terminated connection. If the UE is not capable to set-up a mobile terminated service, verify that the UE is attached and has a default EPS bearer by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure.

Expected behaviour

2. The UE successfully performs the Attach procedure

3. The UE establishes a mobile terminated service connection or a mobile originated service connection.

Example message flow:
## 30.1.1.2 Attach Reject, cause #7 "EPS Services not allowed"

### Description
Check the UE’s behaviour on the reject message with cause 7 ’EPS services not allowed’

### Related core specifications
3GPP TS 24.301, clause 5.5.1.2.5

### Reason for test
To verify that the UE behaves correctly on a reject message “EPS services not allowed”

### Initial configuration
- UE is powered off
- Network does not allow EPS services (e.g. this particular IMSI is not provisioned for EPS services)

### Test procedure
1. Power on the UE and attempt Attach procedure.
2. EMM cause at the time of reception of the Attach Reject message is equal to #7 EPS services not allowed
3. Trigger an Attach procedure (e.g. via AT command). Check whether the UE tries to perform a new registration procedure.

### Expected behaviour
1. The UE attempts to perform Attach procedure.
2. After step 2, UE shall not attempt to perform an additional Attach procedure until it is powered off or the SIM card is removed.
   
   The UE shall delete any GUTI, last visited registered TAI and KSI. The UE shall consider the USIM as invalid for EPS services until switching off or the UICC containing the USIM is removed.

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(ATTACH REQUEST(PDN CONNECTIVITY REQUEST))</td>
<td>RRC(EMM(ESM))</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM</td>
</tr>
<tr>
<td>(8)</td>
<td>←</td>
<td>ESM INFORMATION REQUEST</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>(9)</td>
<td>←</td>
<td>ESM INFORMATION RESPONSE</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>UECapabilityEnquiry</td>
<td>RRC</td>
</tr>
<tr>
<td>12</td>
<td>→</td>
<td>UECapabilityInformation</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>←</td>
<td>SecurityModeCommand</td>
<td>RRC</td>
</tr>
<tr>
<td>14</td>
<td>←</td>
<td>RRCConnectionReconfiguration(ATTACH ACCEPT(ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST))</td>
<td>RRC(EMM(ESM))</td>
</tr>
<tr>
<td>15</td>
<td>→</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRC</td>
</tr>
<tr>
<td>16</td>
<td>→</td>
<td>ATTACH COMPLETE(ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT)</td>
<td>EMM(ESM)</td>
</tr>
<tr>
<td>17</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>

Note: Step 14 - If the UE receives an IPv4 address set to 0.0.0.0, it may negotiate the IPv4 address with DHCPv4 as specified in TS 29.061 [38]. If the UE receives an IPv6 interface identifier, it may wait for the Router Advertisement from the network with the IPv6 prefix information or it may send a Router Solicitation if necessary.
If A/Gb mode or Iu mode is supported by the UE, the UE shall in addition delete P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number

3. UE shall not perform any additional Attach procedure.

30.1.1.3 Attach Reject, cause #14 "EPS Services not allowed in this PLMN"

30.1.1.3.1 Attach Reject, cause #14 "EPS Services not allowed in this PLMN" - multiple PLMN environment

Description
Check the UE’s behaviour on the reject message with cause 14 ‘EPS Services not allowed in this PLMN’

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.5

Reason for test
To verify that the UE behaves correctly on a reject message ‘EPS Services not allowed in this PLMN’

Initial configuration
- UE is powered off and in automatic mode
- Two PLMNs are available:
  - PLMN1 does not allow EPS Services (e.g. no roaming agreement)
  - PLMN2 does have roaming agreement

Test procedure
1. Power on the UE and attempt Attach procedure on PLMN1.
2. EMM cause at the time of reception of Attach Reject message is equal to #14 “EPS Services not allowed in this PLMN”
3. UE selects PLMN2 through automatic PLMN selection process.

Expected behaviour
1. The UE attempts to perform Attach procedure.
2. The UE will not re-attempt to perform an Attach procedure in the PLMN1.
3. UE performs a new ATTACH procedure on selected PLMN – PLMN2.

30.1.1.3.2 Attach Reject, cause #14 "EPS Services not allowed in this PLMN" - single PLMN environment

Description
Check the UE’s behaviour on the reject message with cause 14 ‘EPS Services not allowed in this PLMN’

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.5

Reason for test
To verify that the UE behaves correctly on a reject message ‘EPS Services not allowed in this PLMN’

Initial configuration
- UE is powered off and in automatic mode
- Only one PLMN is present
- The PLMN which is present does not allow EPS Services (e.g. no roaming agreement)
Test procedure
   1. Power on the UE and attempt Attach procedure on the PLMN.
   2. EMM cause at the time of reception of Attach Reject message is equal to #14 “EPS Services not allowed in this PLMN”

Expected behaviour
   1. The UE attempts to perform Attach procedure.
   2. The UE will not re-attempt to perform an Attach procedure.

30.1.1.4 Attach Reject, cause #25 "not authorised for this CSG"

Description
Check the UE’s behaviour on the reject message with cause #25 ‘Not authorized for this CSG’

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.5, 3GPP TS 22.011, clause 8

Reason for test
To verify that the UE behaves correctly on a reject message ‘not authorized for this CSG’

To verify that the UE successfully performs the Attach procedure on cell without CSG Indicator of the same PLMN after it was rejected with Reject Cause #25 'Not authorized for this CSG'

Initial configuration
   - UE is powered off
   - UE is in automatic mode
   - Two eNodeB:
     - eNode B1 has CSG Indicator = True and the broadcasted CSG Identity is part of “Allowed CSG List” stored in UE
     - eNode B2 has CSG Indicator = False
   - Network has removed the UE from the list of CSG Member

Test procedure
   1. Power on the UE and verify that UE sends Attach procedure on eNode B1
   2. The network will send the ATTACH REJECT with cause #25 ‘Not authorized for this CSG’
   3. UE sends ATTACH procedure on eNode B2.

Expected behaviour
   1. The UE attempts to perform Attach procedure.
   2. UE shall remove the CSG ID of the cell where the UE has sent the ATTACH REQUEST message from “Allowed CSG list”. The UE shall search for a suitable cell in the same PLMN.
   3. UE shall send ATTACH procedure using eNode B2.

30.1.1.5 Attach Reject, cause #11 "PLMN not allowed"

Description
Check the UE’s behaviour on the reject message with cause #11 ‘PLMN not allowed’

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.5

Reason for test
To verify that the UE behaves correctly on a reject message ‘PLMN not allowed’
Initial configuration

- The UE is powered off
- The UE is configured to automatic network selection mode
- PLMN1 is a E-UTRA radio access technology network, PLMN2 can be any RAT that is supported by the UE
- The eSIM/USIM has a populated EPSLOC field with PLMN1 as last visited PLMN
- The UE’s “forbidden PLMN list” on the eSIM/USIM is empty
- Roaming is not allowed with PLMN1
- Roaming is allowed with PLMN2

Test procedure

1. Power on the UE and verify that the UE sends an ATTACH REQUEST to the EPS network PLMN1.
2. The EPS network PLMN1 shall respond to the UE with an ATTACH REJECT with Reject Cause #11 ‘PLMN not allowed’.
3. Check that the UE performs an automatic PLMN selection to another PLMN (e.g. PLMN2) without accessing the “forbidden PLMN”.
4. Perform a manual PLMN selection to PLMN1 and verify that the UE attempts to select the “forbidden PLMN”.
5. Perform a manual PLMN selection to PLMN2 and verify that the UE successfully selects the PLMN.
6. Send some data over the selected network (e.g. by using the ping command) to validate that the device is properly connected to the network.
   Note: In case the PLMN2 RAT is not E-UTRA, a PDP context needs to be established.
7. Validate with a SIM card reader that the FPLMN field on the eSIM/USIM contains the forbidden PLMN.

Expected behaviour

1. The UE performs an Attach procedure on PLMN1.
2. The UE shall set the EPS update status to EU3 ROAMING NOT ALLOWED and shall delete any GUTI, last visited registered TAI and KSI. The UE in S1 mode stores the PLMN identity in the “forbidden PLMN” list and enters state EMM-DEREGISTERED.PLMN-SEARCH.
3. The UE performs an automatic PLMN selection without accessing the “forbidden PLMN”.
4. The UE attempts to perform an ATTACH REQUEST on PLMN1, is rejected with Cause #11 and indicates an error message to the user
5. The UE performs a successful ATTACH REQUEST on PLMN2.
6. The UE establishes a service connection.
7. PLMN1 has been written to the FPLMN field on the eSIM/USIM.

30.1.1.6 Attach Reject, cause #3 "Illegal UE"

Description
Check the UE’s behaviour on the reject message with cause #3 ‘Illegal UE’

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.2 and clause 5.5.1.2.5

Reason for test
To verify that the UE behaves correctly on a reject message ‘Illegal UE’
Initial configuration

- At least 2 PLMNs are available and accessible.
- UE is powered off
- The UE cannot pass the authentication check, i.e. the RES received from the UE is different from that generated by the network.

Test procedure

1. Power on the UE and verify that the UE sends an ATTACH REQUEST to the EPS network.
2. The EPS network shall respond to the UE with an ATTACH REJECT with Reject Cause #3 ‘Illegal UE’.
3. Wait for 60s in order to check that the UE is not performing an ATTACH REQUEST to any network.
5. Power Cycle the UE and verify the UE sends an ATTACH REQUEST to the EPS network.

Expected behaviour

1. The UE performs an Attach procedure.
2. The UE shall delete the list of equivalent PLMNs and enter state EMM-DEREGISTERED.
3. The UE does not send any ATTACH REQUEST message.
4. The UE does not send any ATTACH REQUEST message.
5. The UE performs an Attach attempt procedure with IMSI1.

30.1.1.7 Attach Reject, cause #15 "No suitable cells in TA"

30.1.1.7.1 Attach Reject, cause #15 "No suitable cells in TA", E-UTRA only

Description

Check an E-UTRA only UE’s behaviour on the reject message with cause 15 ‘No suitable cells in TA’ in an E-UTRA only environment. This test should be performed in an area where the PLMN has E-UTRA cells available. The test can be performed with a subscription which has not been provisioned for E-UTRA but has been provisioned for UTRA on that PLMN.

Related core specifications

3GPP TS 24.301, clause 5.5.1.2.2 and clause 5.5.1.2.5

Reason for test

To verify that the UE behaves correctly on a reject message “No suitable cell in TA” from the E-UTRA cell. The UE should obtain service on another TA of the same PLMN. If not available the UE shall indicate the loss of service with an appropriate error message.

Initial configuration

- UE is powered off
- UE with USIM that contains IMSI1, GUTI1, TAI1, EPS update status “EU1:UPDATED”
- E-UTRA Cell(s) of PLMN1 available (all belonging to only one TA) and cell(s) of PLMN1 with another Radio Technology
- UE with USIM that contains EPS _LOCI field with PLMN1 as last visited PLMN
- UE’s “forbidden PLMN list” is empty

Test procedure

1. Ensure only PLMN1 with TA1 and PLMN1 with another Radio Technology is available. Power on the UE and verify that the UE sends an ATTACH REQUEST to the EPS network PLMN1 and TA1.
2. The EPS network PLMN1 and TA1 shall respond to the UE with an ATTACH REJECT with Reject Cause #15 ‘No suitable cells in TA’
3. Verify that the UE does not send an ATTACH REQUEST to other cells of TA1.

Expected behaviour
1. The UE performs an Attach procedure on PLMN1 and TA1.
2. The UE shall set the EPS update status to EU3 ROAMING NOT ALLOWED and shall delete any GUTI, last visited registered TAI and KSI. In S1 mode, the UE shall store the current TAI in the list of “forbidden tracking areas for roaming” and enter the state EMM-DEREGISTERED.LIMITED-SERVICE.
3. The UE does not send another ATTACH REQUEST to the network PLMN1 and TA1.

30.1.1.7.2 Attach Reject, cause #15 “No suitable cells in TA”, Multimode

Description
Check a multimode UE’s behaviour on the reject message with cause 15 ‘No suitable cells in TA’ in a multimode environment. This test should be performed in an area where the PLMN has UMTS and E-UTRA cells available. The test can be performed with a subscription which has not been provisioned for E-UTRA but has been provisioned for UMTS on that PLMN.

Related core specifications
3GPP TS 24.301, clause 5.5.1.2.2 and clause 5.5.1.2.5

Reason for test
To verify that the UE behaves correctly on a reject message “No suitable cell in TA” from the E-UTRA cell. The UE does not lose service and should obtain service on another Radio Technology of the same PLMN.

Initial configuration
- UE is powered off
- UE with USIM that contains IMSI1, GUTI1, TAI1, EPS update status “EU1:UPDATED”
- E-UTRA Cell(s) of PLMN1 available (all belonging to only one TA) and cell(s) of PLMN1 with another Radio Technology
- Cells of PLMN2 (VPLMN) available.
- UE with USIM that contains EPS LOCI field with PLMN1 as last visited PLMN
- UE’s “forbidden PLMN list” is empty

Test procedure
4. Ensure only PLMN1 with TA1, PLMN1 with another Radio Technology and PLMN2 can be seen by the UE. Power on the UE and verify that the UE sends an ATTACH REQUEST to the EPS network PLMN1 and TA1.
5. The EPS network PLMN1 and TA1 shall respond to the UE with an ATTACH REJECT with Reject Cause #15 ‘No suitable cells in TA’
6. Verify that the UE does not send an ATTACH REQUEST to other cells of TA1.
7. Verify that the UE sends an ATTACH REQUEST to the cell with another Radio Technology of PLMN1
8. If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered by setting up a mobile originated connection

Expected behaviour
4. The UE performs an Attach procedure on PLMN1 and TA1.
5. The UE shall set the EPS update status to EU3 ROAMING NOT ALLOWED and shall delete any GUTI, last visited registered TAI and KSI. In S1 mode, the UE shall store the current TAI
in the list of "forbidden tracking areas for roaming" and enter the state EMM-DEREGISTERED.LIMITED-SERVICE.

6. The UE does not send another ATTACH REQUEST to the network PLMN1 and TA1.
7. The UE performs an Attach procedure on a cell of PLMN1 with another Radio Technology.
8. The UE establishes a service connection

30.1.1.8 Detach

Description
The UE shall successfully perform a UE initiated detach procedure.

Related core specifications
3GPP TS 24.301, section 5.5.2.2

Reason for test
To verify that the UE successfully performs a UE initiated detach procedure.

Initial configuration
The UE is attached and in idle state.

Test procedure

Scenario A:
1. Power off the UE.
2. Perform a mobile terminated service connection (e.g. voice call or ping) from other device.

Scenario B:
1. Set the UE to “flight mode” or “offline” so that only the RF part is switched off.
2. Perform a mobile terminated service connection (e.g. voice call or ping) from other device.

Expected behaviour
1. If possible use a diagnostic tool to verify that the UE sends a DETACH REQUEST message with the Detach type IE indicating the type of detach, “EPS detach” and “Switch off”
2. Verify that the mobile terminated service connection is not reachable.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRCConnectionSetupComplete(DETACH REQUEST)</td>
<td>RRC(EMM)</td>
</tr>
</tbody>
</table>

30.1.2 Combined Attach and Detach

30.1.2.1 Combined Attach

Description
The UE shall successfully perform the combined “EPS Attach” and “Default EPS Bearer Context Activation” procedures.

Related core specifications
3GPP TS 24.301, clause 5.5.1.3

Reason for test
To verify that the UE can successfully perform the combined attach procedure
Initial configuration

The UE is powered off.

The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation

Test procedure

1. Power on the UE.
2. Verify that the UE sends a combined ATTACH REQUEST to the network.
3. Check that in the ATTACH REQUEST message, the “EPS attach type” parameter holds the “combined EPS/IMSI attach” value.
4. If it is the first time the handset attaches on the network check that in the ATTACH REQUEST message the “EPS mobile identity” parameter holds the “IMSI” value and IE “TMSI Status” is equal to “no valid TMSI available”.
   If it is not the first time the handset attaches (it was on another one beforehand), check that in the ATTACH REQUEST message, UE includes:
   - “EPS mobile identity” parameter holds the “GUTI” value
   - “Old location area identification” IE
5. The TMSI reallocation may be part of the combined attach procedure. The TMSI allocated is then included in the ATTACH ACCEPT message, together with the location area identification (LAI).
6. Check that in the ATTACH ACCEPT message, the “EPS Attach result” parameter holds the “combined EPS/IMSI attach” value.
7. The UE, when receiving the ATTACH ACCEPT message combined with the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, shall send an ATTACH COMPLETE message combined with an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT.

Expected behaviour

At step 5:
- If the message contains an IMSI, the UE is not allocated any TMSI, and shall delete any TMSI accordingly.
- If the message contains a TMSI, the UE shall use this TMSI as the new temporary identity.
- If neither a TMSI nor an IMSI has been included by the network in the ATTACH ACCEPT message, the old TMSI, if any available, shall be kept.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(ATTACH REQUEST(PDN CONNECTIVITY REQUEST))</td>
<td>RRC(EMM(ESM))</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>(8)</td>
<td>←</td>
<td>ESM INFORMATION REQUEST</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>(9)</td>
<td>→</td>
<td>ESM INFORMATION RESPONSE</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>UECapabilityEnquiry</td>
<td>RRC</td>
</tr>
<tr>
<td>12</td>
<td>→</td>
<td>UECapabilityInformation</td>
<td>RRC</td>
</tr>
<tr>
<td>12</td>
<td>←</td>
<td>SecurityModeCommand</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>→</td>
<td>SecurityModeComplete</td>
<td>RRC</td>
</tr>
<tr>
<td>14</td>
<td>←</td>
<td>RRCConnectionReconfiguration(ATTACH ACCEPT(ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST))</td>
<td>RRC(EMM(ESM))</td>
</tr>
</tbody>
</table>
### 30.1.2.2 Combined Attach - successful for EPS services only, cause #18 "CS Domain not available"

**Description**
Check the UE's behaviour in case if Combined attach procedure is successful for EPS Services only.

**Related core specifications**
3GPP TS 24.301, clause 5.5.1.3

**Reason for test**
To verify that the UE behaves correctly on a reject message with cause #18 "CS Domain not available".

**Initial configuration**
The UE is powered off.

The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation

**Test procedure**
1. Power on the UE.
2. Verify that the UE sends a combined ATTACH REQUEST to the network.
3. Check that in the ATTACH REQUEST message, the “EPS attach type” parameter holds the “combined EPS/IMSI attach” value.
4. If it is the first time the handset attaches on the network check that in the ATTACH REQUEST message the “EPS mobile identity” parameter holds the “IMSI” value and IE “TMSI Status” is equal to “no valid TMSI available”.
   - If it is not the first time the handset attaches (it was on another one beforehand), check that in the ATTACH REQUEST message, UE includes:
     - “EPS mobile identity” parameter holds the “GUTI” value
     - “Old location area identification” IE
5. MME sends ATTACH ACCEPT, The EPS attach result IE value indicates "EPS only". Attach for EPS services have been successful but attach for non-EPS services has failed.
   - EMM cause value is equal to cause #18 “CS Domain not available”

**Expected behaviour**
At step 5 of message flow:
- A UE in CS/PS mode 1 of operation with "IMS voice not available" shall attempt to select GERAN or UTRAN radio access technology rather than E-UTRAN for the selected PLMN or equivalent PLMN. The UE shall disable the E-UTRAN capability
- UE in CS/PS mode 2 of operation shall not attempt combined attach or combined tracking area update procedure with current PLMN until switching off the UE or the UICC containing the USIM is removed

Note: "IMS voice not available" refers to one of the following conditions:
- the UE is not configured to use IMS;
• the UE is not configured to use IMS voice, i.e. when the voice domain preference, as defined in 3GPP TS 24.167 [13B], indicates that voice communication services are allowed to be invoked only over the CS domain;

• the UE is configured to use IMS voice, but the network indicates in the ATTACH ACCEPT message or the TRACKING AREA UPDATE ACCEPT message that IMS voice over PS sessions are not supported; or

• the UE is configured to use IMS voice, the network indicates in the ATTACH ACCEPT message or the TRACKING AREA UPDATE ACCEPT message that IMS voice over PS sessions are supported, but registration to IMS has failed.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RRCConnectionRequest</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>RRCConnectionSetup</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>RRCConnectionSetupComplete(ATTACH REQUEST(PDN CONNECTIVITY REQUEST))</td>
<td>RRCConnectionSetupComplete(ATTACH REQUEST(PDN CONNECTIVITY REQUEST))</td>
<td>RRC(EMM(ESM))</td>
</tr>
<tr>
<td>4</td>
<td>AUTHENTICATION REQUEST</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM (OPTIONAL)</td>
</tr>
<tr>
<td>5</td>
<td>AUTHENTICATION RESPONSE</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM (OPTIONAL)</td>
</tr>
<tr>
<td>6</td>
<td>SECURITY MODE COMMAND</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM (OPTIONAL)</td>
</tr>
<tr>
<td>7</td>
<td>SECURITY MODE COMPLETE</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM (OPTIONAL)</td>
</tr>
<tr>
<td>8</td>
<td>ESM INFORMATION REQUEST</td>
<td>ESM INFORMATION REQUEST</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>9</td>
<td>ESM INFORMATION RESPONSE</td>
<td>ESM INFORMATION RESPONSE</td>
<td>ESM(OPTIONAL)</td>
</tr>
<tr>
<td>10</td>
<td>UECapabilityEnquiry</td>
<td>UECapabilityEnquiry</td>
<td>RRC</td>
</tr>
<tr>
<td>12</td>
<td>UECapabilityInformation</td>
<td>UECapabilityInformation</td>
<td>RRC</td>
</tr>
<tr>
<td>13</td>
<td>SecurityModeCommand</td>
<td>SecurityModeCommand</td>
<td>RRC</td>
</tr>
<tr>
<td>14</td>
<td>RRCConnectionReconfiguration(ATTACH ACCEPT(ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST)),</td>
<td>RRCConnectionReconfiguration(ATTACH ACCEPT(ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST)),</td>
<td>RRC(EMM(ESM)) EPS attach result IE=&quot;EPS ONLY&quot;, EMM Cause #18</td>
</tr>
<tr>
<td>15</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRC</td>
</tr>
<tr>
<td>16</td>
<td>ULInformationTransfer(ATTACH COMPLETE (ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT))</td>
<td>ULInformationTransfer(ATTACH COMPLETE (ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT))</td>
<td>EMM(ESM)</td>
</tr>
<tr>
<td>17</td>
<td>RRCConnectionRelease</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>

30.1.2.3 Combined Detach

Description
The UE shall successfully perform a UE initiated combined detach procedure.

Related core specifications
3GPP TS 24.301, section 5.5.2.2.

Reason for test
To verify that the UE successfully performs a UE initiated combined detach procedure.

Initial configuration
The UE is registered for EPS and for non-EPS services

Test procedure

Scenario A:
1. Power off the UE.
2. Perform a mobile terminated service connection (e.g. voice call or ping) from other device.

Scenario B:
1. Set the UE to “flight mode” or “offline” so that only the RF part is switched off.
2. Perform a mobile terminated service connection (e.g. voice call or ping) from other device.

**Expected behaviour**

1. If possible use a diagnostic tool to verify that the UE sends a DETACH REQUEST message with the Detach type IE indicating the type of detach, “combined EPS/IMSI detach” and “switch off”.
2. Verify that the mobile terminated service connection is not reachable.

**Example message flow:**

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete (DETACH REQUEST)</td>
<td>RRC (EMM)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>

30.1.2.4 Combined NW initiated detach - re-attach required

**Description**
Check the UE’s behaviour in case of NW initiated detach - re-attach required.

**Related core specifications**
3GPP TS 24.301, clause 5.5.2.3.2

**Reason for test**
To verify that the UE behaves correctly on a UE initiated detach - re-attach required.

**Initial configuration**
UE is powered on and in idle state

**Test procedure**

1. The EPS network sends a DETACH REQUEST with the detach Type IE “re-attach required”.
2. Check that the UE responds with a DETACH ACCEPT message.
3. Verify that the UE sends an ATTACH REQUEST message to the EPS network.
4. Upon receiving an ATTACH REQUEST message by the UE the EPS network sends an ATTACH ACCEPT message.
5. If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered by setting up a mobile originated connection.

**Expected behaviour**

2. The UE deactivates all EPS bearer contexts (including a default bearer context) without any signalling and sends a DETACH ACCEPT message to the EPS network.
3. After the UE has completed the detach procedure it sends an ATTACH REQUEST. The attach procedure includes a PDN CONNECTIVITY REQUEST.
4. The UE responds with an ATTACH COMPLETE message including an ACTIVATE DEFAULT EPS BEARER ACCEPT.
5. The UE establishes a service connection
30.2 Tracking Area Update

30.2.1 Normal Tracking Area Update

30.2.1.1 Normal Tracking Area Update without ISR activation; Successful

Description
The UE shall successfully perform a Tracking Area Update procedure after reselecting a cell in a new Tracking Area.

Related core specifications
3GPP TS 24.301, section 5.5.3.2

Reason for test
To verify that the UE successfully performs a Tracking Area Update procedure, after reselecting a cell in a new Tracking Area.

Initial configuration
UE is registered and in idle state.

Test procedure
1. UE detects it has entered a new TA that is not in the list of TAI's that the UE registered with the network.
2. The UE shall send a TRACKING AREA UPDATE REQUEST message to the network. If possible use a diagnostic tool to verify that the “EPS update type” parameter is set to “TA updating”.
3. The network shall respond with TRACKING AREA UPDATE ACCEPT message to the UE.
4. If the TRACKING AREA UPDATE ACCEPT message contained a GUTI, the UE shall return a TRACKING AREA UPDATE COMPLETE message to the MME to acknowledge the received GUTI.
5. If possible use a diagnostic tool to check the UE sets the EPS update status to EU1 UPDATED.
6. Verify that the UE is registered to the new Tracking Area correctly by setting up a mobile terminated connection after the Tracking Area Update procedure.
7. If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered to the new Tracking Area by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure.

Expected behaviour
1. The UE performs a Tracking Area Update procedure.
2. The UE establishes a mobile terminated service connection or a mobile originated service connection.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(TRACKING AREA UPDATE REQUEST)</td>
<td>RRC(EMM)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>TRACKING AREA UPDATE ACCEPT</td>
<td>EMM</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>
30.2.1.2 Normal Tracking Area Update with ISR activation; Successful

Description
The UE shall take in account “ISR Activated” IE in the Tracking Area Update procedure.

Related core specifications
3GPP TS 24.301, section 5.5.3.2; 3GPP TS 23.401, section 4.3.5.6; 3GPP TS 23.401, Annex J

Reason for test
To verify that UE is not performing RAU procedure in new RAT in case if previous TAU procedure has activated ISR function

Initial configuration
UE is registered and in idle state camped on GSM/WCDMA
Core Network is ISR capable

Test procedure
1. UE performs reselection from GSM/WCDMA RAT to E-UTRAN
2. UE detects it has entered a new TA that is not in the list of TAs that the UE registered with the network.
3. The UE shall send a TRACKING AREA UPDATE REQUEST message to the network. Check that the “EPS update type” parameter is set to “TA updating”.
4. The network shall respond with TRACKING AREA UPDATE ACCEPT message to the UE.
5. If the TRACKING AREA UPDATE ACCEPT message contains an indication that ISR is activated (EPS update result = “TA updated and ISR activated”), the UE shall regard a previously assigned P-TMSI and RAI as valid and registered with the network. If the TIN currently indicates "P-TMSI", the UE shall set the TIN to "RAT-related TMSI"
6. Optionally, if the TRACKING AREA UPDATE ACCEPT message contained a GUTI, the UE shall return a TRACKING AREA UPDATE COMPLETE message to the MME to acknowledge the received GUTI.
7. Reselect to the RA/LA of the GSM/WCDMA RAT of Step 1

Expected behaviour
7. Once UE reselects to new RAT, it shall not perform any Routing Area Update procedure.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(TRACKING AREA UPDATE REQUEST)</td>
<td>RRC(EMM)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>TRACKING AREA UPDATE ACCEPT</td>
<td>EPS Update result IE = “TA Updated and ISR Activated”</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>
30.2.2 Periodic Tracking Area Update

30.2.2.1 Periodic Tracking Area Update; Successful

Description
The UE shall successfully perform a Periodic Tracking Area Update procedure after the expiry of the T3412 timer.

Related core specifications
3GPP TS 24.301, section 5.5.3.2.

Reason for test
To verify that the UE successfully performs a Periodic Tracking Area Update procedure after the expiry of the T3412 timer.

Initial configuration
The UE is attached and in idle state, T3412 is reset.

Test procedure
1. Wait for the T3412 timer to expire, and if possible use a diagnostic tool to verify that the UE sends a TRACKING AREA UPDATE REQUEST message with EPS update type set to "periodic updating".
2. Verify that the UE is registered to the Tracking Area correctly by setting up a mobile terminated connection after the Tracking Area Update procedure.
3. If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered to the Tracking Area by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure.

Expected behaviour
1. The UE performs a Periodic Tracking Area Update procedure.
2. The UE establishes a mobile terminated service connection.
3. The UE establishes a mobile originated service connection.

Example Message Flow

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRCConnectionSetupComplete(TRACKING AREA UPDATE REQUEST)</td>
<td>RRC(EMM)</td>
</tr>
<tr>
<td>(4)</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>(5)</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>(6)</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>(7)</td>
<td>➔</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM</td>
</tr>
<tr>
<td>(9)</td>
<td>➔</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>

30.2.3 Combined Tracking Area Update

30.2.3.1 Combined Tracking Area Update; Successful

Description
The UE shall successfully perform the combined “Tracking Area Update” upon reselection to a cell in new Tracking Area
Related core specifications
3GPP TS 24.301, section 5.5.3.3

Reason for test
To verify that UE successfully performs the combined "Tracking Area Update" upon reselection to a cell in new Tracking Area

Initial configuration
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation
The UE is in idle mode and has successfully registered for CS and PS Domain previously (either in GSM/WCDMA or E-UTRA)
Network supports combined tracking area update procedure

Test procedure
1. UE detects it has entered a new TA that is not in the list of TAs that the UE registered with the network.
2. The UE shall send a TRACKING AREA UPDATE REQUEST message to the network. Check that the "EPS update type" parameter is set to "combined TA/LA updating"
3. MME sends the TRACKING AREA UPDATE ACCEPT with the EPS update result IE value indicating "combined TA/LA updated".

Expected behaviour
After step 3:
• If the TRACKING AREA UPDATE ACCEPT message contained a GUTI, the UE shall return a TRACKING AREA UPDATE COMPLETE message to the MME to acknowledge the received GUTI.
• If the TRACKING AREA UPDATE ACCEPT message contains a TMSI, the UE shall use this TMSI as new temporary identity. The UE shall delete its old TMSI and shall store the new TMSI. In this case, a TRACKING AREA UPDATE COMPLETE message is returned to the network to confirm the received TMSI

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(TRACKING AREA UPDATE REQUEST)</td>
<td>RRC(EMM)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>TRACKING AREA UPDATE ACCEPT</td>
<td>EMM.</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRCConnectionRelease</td>
<td>RRC</td>
</tr>
</tbody>
</table>

30.2.3.2 Combined Tracking Area Update; for EPS Services only, cause #18 "CS Domain not available"

Description
Check the UE behaviour in case if Combined TAU procedure is successful for EPS Services only.

Related core specifications
3GPP TS 24.301, section 5.5.3.3
Reason for test
To verify that the UE behaves correctly on a reject message with cause #18 "CS Domain not available"

Initial configuration
The UE is in idle mode and has successfully registered for CS and PS Domain previously (either in GSM/WCDMA or E-UTRA)
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation
Network does not support the CS Domain in the new TA

Test procedure
1. UE detects it has entered a new TA that is not in the list of TAI that the UE registered with the network.
2. The UE shall send a TRACKING AREA UPDATE REQUEST message to the network. Check that the “EPS update type” parameter is set to “combined TA/LA updating”
3. MME sends the TRACKING AREA UPDATE ACCEPT with the EPS update result IE value indicates "TA updated". Tracking area updating is successful, but location area updating is not successful.
4. EMM cause value is equal to cause #18 “CS Domain not available”

Expected behaviour
At step 3 of message flow:
- A UE in CS/PS mode 1 of operation with "IMS voice not available" shall attempt to select GERAN or UTRAN radio access technology rather than E-UTRAN for the selected PLMN or equivalent PLMN. The UE shall disable the E-UTRAN capability
- UE in CS/PS mode 2 of operation shall not attempt combined attach or combined tracking area update procedure with current PLMN until switching off the UE or the UICC containing the USIM is removed

Note: "IMS voice not available" refers to one of the following conditions:
- the UE is not configured to use IMS;
- the UE is not configured to use IMS voice, i.e. when the voice domain preference, as defined in 3GPP TS 24.167 [13B], indicates that voice communication services are allowed to be invoked only over the CS domain;
- the UE is configured to use IMS voice, but the network indicates in the ATTACH ACCEPT message or the TRACKING AREA UPDATE ACCEPT message that IMS voice over PS sessions are not supported; or
- The UE is configured to use IMS voice, the network indicates in the ATTACH ACCEPT message or the TRACKING AREA UPDATE ACCEPT message that IMS voice over PS sessions are supported, but registration to IMS has failed.

Example Message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>TRACKING AREA UPDATE REQUEST</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>IDENTITY REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>IDENTITY RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>➔</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>➔</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>➔</td>
<td>TRACKING AREA UPDATE ACCEPT, &quot;TA UPDATED&quot;, EMM CAUSE #18</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>➔</td>
<td>TRACKING AREA UPDATE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>RRCCONNECTIONRELEASE</td>
<td>RRC</td>
</tr>
</tbody>
</table>
30.3 PLMN Selection

30.3.1 Automatic Mode, at power on

30.3.1.1 UE selects a prioritised network (User controlled PLMnwAcT List on the USIM)

Description
To verify that the UE correctly selects a designated and prioritized network.

Related core specifications
3GPP TS 23.122

Reason for test
The purpose of the test is to ensure that the UE is reading the data from \(\text{EF}_{\text{PLMnwAcT}}\) on the USIM and using it correctly.

Initial configuration
The USIM card shall be EPS enabled for roaming with access to all available networks. The UE is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN. A location with at least 3 PLMNs is used.

A Prioritized Network BCCH (amongst other non-prioritized networks BCCH) is broadcasted.

One USIM prioritized network located in the last entry of \(\text{EF}_{\text{PLMnwAcT}}\) \(\text{EF}_{\text{OPLMnwAcT}}\) is required.

The UE is switched off, in automatic network selection mode.

Initial conditions for the USIM
The USIM card shall support preferably 128 (but not less than 100) entries on the \(\text{EF}_{\text{PLMnwAcT}}\) and \(\text{EF}_{\text{OPLMnwAcT}}\).

<table>
<thead>
<tr>
<th>Location Information ((\text{EF}_{\text{Loc}}))</th>
<th>FF FF FF FF FF FF FF 00 00 00 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden PLMN ((\text{EF}_{\text{FPLMN}}))</td>
<td>FF FF FF FF FF FF FF FF FF FF FF FF</td>
</tr>
<tr>
<td>PLMN Selector ((\text{EF}_{\text{PLMnwAcT}}))</td>
<td>(\text{MCC} \ xxx / \text{MNC} \ yy) of the Preferred PLMN is put on the last position of the following PLMN Selector:</td>
</tr>
<tr>
<td></td>
<td>USIM</td>
</tr>
<tr>
<td></td>
<td>(\text{EF}_{\text{PLMnwAcT}})</td>
</tr>
<tr>
<td></td>
<td>All other fields in (\text{EF}_{\text{PLMnwAcT}}) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology (2 bytes, set to C0 80)</td>
</tr>
<tr>
<td></td>
<td>\textbf{Note}: \ xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.</td>
</tr>
<tr>
<td>OPLMN Selector ((\text{EF}_{\text{OPLMnwAcT}}))</td>
<td>Not relevant for this test.</td>
</tr>
</tbody>
</table>

Test procedure
The non-prioritized network(s) should transmit with a higher power than the prioritized network. The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm; P-CPICH RSCP better than -95 dBm for UMTS-FDD or RSRP is greater than -110 dBm for E-UTRA

Expected behaviour
The UE shall select the prioritized PLMN network and ignore the non-prioritized PLMNs.
### 30.3.1.2 UE selects a prioritised network (Operator controlled PLMNwAcT List on the USIM)

**Description**
Verification that the UE correctly selects a designated and prioritized network.

**Related core specifications**
3GPP TS 23.122

**Reason for test**
The purpose of the test is to ensure that the UE is reading the data from EF_{OPLMNwAcT} on the USIM and using it correctly.

**Initial configuration**
The USIM card shall be EPS enabled for roaming with access to all available networks.
UE is switched off, in automatic network selection mode, located outside the coverage area of the HPLMN.
A location with at least 3 PLMNs is used.
A Prioritized Network BCCH (amongst other non-prioritized networks BCCH) is broadcasted.
One USIM prioritized network located in the last entry of EF_{PLMNwAcT} / EF_{OPLMNwAcT} is required.
UE is switched off, in automatic network selection mode.

**Initial conditions for the USIM (both Procedures)**
The USIM card shall support preferably 128 (but not less than 100) entries on the EF_{PLMNwAcT} and EF_{OPLMNwAcT}.

<table>
<thead>
<tr>
<th>Location Information (EF_{LOC})</th>
<th>FF FF FF FF FF FF FF 00 00 00 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden PLMN (EF_{FPLMN})</td>
<td>FF FF FF FF FF FF FF FF FF FF FF FF</td>
</tr>
<tr>
<td>PLMN Selector (EF_{PLMNwAcT})</td>
<td>The MCC xxx / MNC yy of the Preferred PLMN and the rest of PLMNs available at test location must NOT be stored in EF_{PLMNwAcT}</td>
</tr>
<tr>
<td>PLMN Selector (EF_{OPLMNwAcT})</td>
<td>The MCC xxx / MNC yy of the Preferred PLMN is placed on the last position of the following PLMN Selector:</td>
</tr>
<tr>
<td></td>
<td>USIM</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All other fields are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology (2 bytes, set to C0 80)</td>
</tr>
</tbody>
</table>

**Note:** xxx and yy should be the MCC and MNC of one of the available networks, but not the HPLMN.

**Test procedure**
The non-prioritized network(s) should transmit with a higher power than the prioritized network. The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm; P-CPICH RSCP better than -95 dBm for UMTS-FDD or RSRP is greater than -110 dBm for E-UTRA

**Expected behaviour**
The UE shall select the prioritized PLMN network and ignore the non-prioritized PLMNs.
30.3.1.3 Periodic HPLMN searching when in Roaming - UE re-selects a higher prioritised network when camping on a prioritised network

Description
To identify the behaviour of the UE when it camps on a prioritized network and the HPLMN Search Period Timer (EF_HPLMN) expires in an area where a higher prioritized network is available.

Related core specifications
3GPP TS 23.122, 3GPP TS 36.304

Reason for test
This test shall verify that the network selection conforms to the Rel-8 Specification.

Initial configuration
An USIM shall be used for this test where:

<table>
<thead>
<tr>
<th>On the USIM</th>
<th>The MCC / MNC of the Preferred VPLMN A and VPLMN B are put on the last two positions of the PLMN Selector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN Selector (EF_PLMNwAcT)</td>
<td>All other fields in all PLMN Selectors (EF_PLMNwAcT, EF_OPLMNwAcT) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td>Access Technology for EF_PLMNwAcT</td>
<td>Access Technology for EF_PLMNwAcT and EF_OPLMNwAcT (2 bytes, set to C0 80)</td>
</tr>
</tbody>
</table>

For this test a special USIM is recommended. For this card the HPLMN Search Period Timer (EF_HPLMN) be set to 6 minutes (“01”)

UE has already successfully selected the prioritized network VPLMN A and if left on, in automatic network selection mode.

Test procedure
The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm; P-CPICH RSCP better than -95 dBm for UMTS-FDD or RSRP is greater than -110 dBm for E-UTRA

While driving around the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device should select VPLMN B.

One drives to a location where both, VPLMN A and VPLMN B are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_HPLMN) so that a PLMN background scan is activated.

Expected behaviour
It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF_HPLMN).

30.3.1.4 Periodic HPLMN searching when in Roaming - UE re-selects a higher prioritised network when camping on a non-prioritised network

Description
To identify the behaviour of the UE when it camps on a non-prioritized network and the HPLMN Search Period Timer (EF_HPLMN) expires in an area where a higher prioritized network is available.

Related core specifications
3GPP TS 23.122, 3GPP TS 36.304

Reason for test
This test shall verify that the network selection conforms to the Rel-8 Specification.
Initial configuration

An USIM shall be used for this test where:

<table>
<thead>
<tr>
<th>On the USIM</th>
<th>The MCC / MNC of the Preferred VPLMN A are put on the last position of the PLMN Selector.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PLMN Selector (EF_{PLMNwAcT})</td>
<td>All other fields in all PLMN Selectors (EF_{PLMNwAcT}, EF_{OPLMNwAcT}) are filled with network codes corresponding to networks not available at the test location.</td>
</tr>
<tr>
<td></td>
<td>Access Technology for EF_{PLMNwAcT} and EF_{OPLMNwAcT} (2 bytes, set to C0 80)</td>
</tr>
</tbody>
</table>

For this test a special USIM is recommended. For this card the HPLMN Search Period Timer (EF_{HPPLMN}) be set to 6 minutes (“01”) UE has already successfully selected the prioritized network VPLMN A and if left on, in automatic network selection mode.

Test procedure

The UE is powered up at a location, where not less than 3 networks are available with a field strength of GSM better than –85 dBm; P-CPICH RSCP better than -95 dBm for UMTS-FDD or RSRP is greater than -110 dBm for E-UTRA

While driving around, the coverage of VPLMN A shall be lost (for all radio access technologies of this PLMN). The device shall then select a non-prioritized VPLMN.

One drives to a location where both, VPLMN A and the non-prioritized VPLMN are available.

The tester shall wait for a period of time greater than the HPLMN Search Period Timer (EF_{HPPLMN}) so ensure a PLMN background scan is activated.

Expected behaviour

It shall be checked that the device selects VPLMN A after expiry of HPLMN Search Period Timer (EF_{HPPLMN}).

30.3.1.5 Automatic Mode - UE ignores CSG cell if Allowed CSG list is empty or not supported

Description

Verification that the UE correctly selects a designated and prioritized network in case if it is not supporting CSG (Closed Subscriber Group) or Allowed CSG list is empty

Related core specifications

3GPP TS 23.122, clause 3.1A, 3GPP TS 36.304, clause 4.3, 3GPP TS 22.011, clause 8, 3GPP TS 36.331, clause B.2

Reason for test

The purpose of the test is to ensure that the MS camps on a cell in that PLMN only if the cell is not a CSG cell.

Initial configuration

UE does not support CSG, or in case if it supports EF_{ACSGL} is not present on USIM card.

UE is powered off in automatic mode.

Two cells with the same PLMN ID (MCC-MNC):
- Cell 1 with CSG ID1
- Cell 2 is not an CSG Cell

Cell 1 has higher RSRP than Cell 2.

Both cells fulfils S criterion.

Test procedure

1. UE is powered on
2. UE should perform attach procedure on the cell without CSG identifier

**Expected behaviour**

At step 2):
- UE shall not consider Cell 1 as suitable cell for cell selection process.
- UE shall select Cell 2 as a suitable cell, even if Cell 1 has $S$ criterion of higher value than Cell 2.

### 30.3.2 Manual Mode

#### 30.3.2.1 Network Selection - Manual Mode

**Description**

If in manual network selection mode, the UE shall list all available PLMNs. This behaviour is independent from the content of the preferred PLMN list.

**Related core specifications**

3GPP TS 22.011, sub clause 3.2.2.2

**Reason for test**

To ensure that the correct list of PLMNs is displayed for the purposes of manual PLMN selection.

**Initial configuration**

UE switched on, in automatic selection mode in an area with coverage from GSM, UMTS and E-UTRAN networks.

**Test procedure**

**Scenario A:**

1. The number of the entries in preferred PLMN list is less than or equal to 32 entries
2. Select the manual network selection mode on the UE and ensure that the list of all available PLMNs is displayed, and that the displayed networks can be selected, even if on the forbidden list.
3. Check that the preferred PLMN list is not changed after the manual network selection.

**Scenario B:**

Repeat the test with an empty list in the preferred PLMN lists.

**Scenario C:**

Repeat the test with more than 32 entries in the preferred PLMN list.

**Expected behaviour**

The UE shall display all available PLMNs and it shall perform manual network selection on the chosen network. The preferred PLMN list is not changed after the manual network selection.

The UE shall display all available GSM/UMTS and E-UTRAN networks.

#### 30.3.2.2 Network Selection - Manual Mode - Available CSG ID List

**Description**

In manual mode, the MS indicates to the user the list of available CSGs in the currently selected PLMN. The list of CSGs presented to the user is not restricted by the allowed CSG list stored in the MS.

**Related core specifications**

3GPP TS 23.122, clause 3.1A, 3GPP TS 36.304, clause 4.3, 3GPP TS 22.011, clause 8
Reason for test
To ensure that the correct list of cells with associated CSG ID (or HNB Name) is displayed for the purposes of manual CSG ID selection.

Initial configuration
UE supports CSG.
UE switched on, in automatic selection mode in an area with coverage of E-UTRAN cells with multiple CSG IDs.

Test procedure
Select the manual CSG ID selection mode on the UE and ensure that the list of all available CSG cells is displayed, and that the displayed CSG cells can be selected, even if it does not belongs to “Available CSG ID List”

Expected behaviour
The available CSG identities shall be displayed in the following order:
- The CSG identities that are contained in the “Available CSG ID list”
- Any other CSG identity not included in the “Available CSG ID list”
When the user selects an entry in the list, the UE shall select any of the available CSG cells with the CSG identity chosen by the user and attempt to register.

30.3.2.3 Network Selection - Selection mode following switch off

Description
The UE shall be retaining its configuration of automatic and manual network selection modes when switched off.

Related core specifications
3GPP TS 22.011, sub clause 3.2.2.2

Reason for test
To ensure that the UE retains its configuration of manual and automatic selection modes when switched off.

Initial configuration
UE in idle mode, with automatic network selection mode configured.

Test procedure
Scenario A:
Change to manual network selection. Turn the UE off and on again. Check that the manual network selection mode is in use.

Scenario B:
Change to automatic network selection. Turn the UE off and on again. Check that the automatic network selection mode is in use.

Expected behaviour
The UE has the same selection mode when switched on that it had when switched off.
31 MOBILITY

31.1 Idle Mode Reselection

31.1.1 Idle Mode E-UTRA Reselection

31.1.1.1 Idle Mode E-UTRA Intra-Frequency Reselection

Description
The UE should perform a reselection without losing service.

Related core specifications
3GPP TS36.304

Reason for test
To ensure that the UE performs a reselection correctly without losing service.

Initial configuration
There must be a sufficient number of E-UTRAN cells available on the same PLMN, and the UE should be in idle mode (ECM-IDLE and EMM-REGISTERED).

Test procedure
Move between the coverage areas of different cells on a test route. The test route(s) should contain the scenarios listed below. Ensure that the UE performs reselections as expected. During the reselections it is imperative the UE remains in service at all times, and that its PDN Connectivity context remains viable before and after the reselections. Where possible, this procedure should be carried out as follows:

- Between cells sharing a Tracking Area
- Between cells utilising the same E-UTRA ARFCN
- In areas of poor signal strength.

Expected behaviour
The UE should perform reselections correctly, without losing service, and its PDN connectivity should remain viable before and after the reselections. The UE should successfully establish a mobile terminated service connection after the reselections. If the UE is not capable to setup a mobile terminated service, verify that the UE can setup a mobile originated connection (e.g. Service Request procedure)

31.1.1.2 Idle Mode E-UTRA Inter-Frequency Reselection

Description
The UE should perform a reselection without losing service.

Related core specifications
3GPP TS36.304

Reason for test
To ensure that the UE performs a reselection correctly without losing service.

Initial configuration
There must be a sufficient number of E-UTRAN cells available on the same PLMN, and the UE should be in idle mode (ECM-IDLE and EMM-REGISTERED).

Test procedure
Move between the coverage areas of different cells on a test route. The test route(s) should contain the scenarios listed below. Ensure that the UE performs reselections as expected. During the reselections it is imperative the UE remains in service at all times, and that its PDN Connectivity
context remains viable before and after the reselections. Where possible, this procedure should be carried out as follows:

- Between cells sharing a Tracking Area
- Between cells utilising different E-UTRA ARFCNs belonging to a common E-UTRA frequency band
- In areas of poor signal strength.

**Expected behaviour**

The UE should perform reselections correctly, without losing service, and its PDN connectivity should remain viable before and after the reselections. The UE should successfully establish a mobile terminated service connection after the reselections. If the UE is not capable to setup a mobile terminated service, verify that the UE can setup a mobile originated connection (e.g. Service Request procedure)

### 31.1.2 Idle Mode Inter RAT Reselection

#### 31.1.2.1 Idle Mode E-UTRA <-> UTRA Reselection

##### 31.1.2.1.1 Idle Mode E-UTRA -> UTRA Reselection

**Description**

The UE should perform a reselection without losing service.

**Related core specifications**

3GPP TS36.304, clause 5.2.4.5

**Reason for test**

To ensure that the UE performs correctly an Idle Mode E-UTRA->UTRA reselection procedure without losing service.

**Initial configuration**

- UE is powered on and in IDLE state (RRC_IDLE)
- UE is registered in E-UTRAN cell (ECM_IDLE & EMM-REGISTERED)
- UE has a default bearer assigned
- There must be a sufficient number of E-UTRAN and UTRAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.

**Test procedure**

1. Move from the coverage areas of E-UTRA to the coverage area of UTRA Service.
2. Ensure that the UE performs the reselection including a RAU procedure in the UTRA cell as expected, if ISR is not active. During the reselection it is imperative that the UE remains in service at all time.
3. Verify that the UE is attached by setting up a mobile terminated connection.
   - If the UE is not capable to setup a mobile terminated service or if the network is not able to maintain the PDP context, verify that the UE is registered to the new Routing Area by setting up a mobile originated connection without establishing a redundant Routing Area Update procedure.

**Expected behaviour**

2. The UE should perform the reselection including a RAU procedure, if ISR is not active, in the UTRA cell correctly, without losing service.
3. The UE establishes a service connection.
31.1.2.1.2  Idle Mode UTRA -> E-UTRA Reselection - PDP Context not active

Description
The UE should perform a reselection without losing service.

Related core specifications
3GPP TS 25.304, clause 5.2.6.1.2a and 5.2.6.1.4a

Reason for test
To ensure that the UE performs correctly an Idle Mode 3G->E-UTRA reselection procedure without losing service.

Initial configuration
- UE is powered on and in IDLE state (RRC_IDLE)
- PDP Context not active
- UE is registered in UTRAN cell
- There must be a sufficient number of E-UTRAN and UTRAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.

Test procedure
1. Move from the coverage area of UTRA to the coverage area of E-UTRA Service.
2. Ensure that the UE performs a reselection into an E-UTRA cell including an Attach procedure or a TAU procedure which is rejected with cause code #40 (No EPS bearer context activated) followed by an Attach procedure, if ISR is not active. During the reselection it is imperative the UE remains in service at all time.
3. Verify that the UE is connected by using the ‘ping’ command over a default bearer. Depending on the UE this might require to ‘connect’ to the network first from a user perspective even though the attach procedure already includes the default bearer activation.

Expected behaviour
2. The UE should perform the reselection including an Attach procedure, if ISR is not active, in the E-UTRA cell correctly, without losing service.
3. The UE establishes a service connection.

31.1.2.1.3  Idle Mode UTRA -> E-UTRA Reselection - PDP context active

Description
The UE should perform a reselection without losing service.

Related core specifications
3GPP TS 25.304, clause 5.2.6.1.2a and 5.2.6.1.4a

Reason for test
To ensure that the UE performs correctly an Idle Mode 3G->E-UTRA reselection procedure without losing service.

Initial configuration
- UE is powered on and in IDLE state (RRC_IDLE)
- PDP context active
- UE is registered in UTRAN cell
- There must be a sufficient number of E-UTRAN and UTRAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.
Test procedure

1. Move from the coverage area of UTRA to the coverage area of E-UTRA Service.

2. Ensure that the UE performs reselection including a TAU procedure, if ISR is not active, into E-UTRA cell as expected. During the reselection it is imperative the UE remains in service at all time.

3. Verify that the UE is connected by setting up a mobile terminated connection.

   If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered to the new Tracking Area by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure

Expected behaviour

2. The UE should perform the reselection including a TAU procedure, if ISR is not active, in the E-UTRA cell correctly, without losing service.

3. The UE establishes a service connection

31.1.2.2 Idle Mode E-UTRA <-> GERAN Reselection

31.1.2.2.1 Idle Mode E-UTRA -> GERAN Reselection

Description
The UE should perform a reselection without losing service.

Related core specifications
TS 36.304, clause 5.2.4.1, 5.2.4.2 and 5.2.4.5

Reason for test
To ensure that the UE performs correctly an Idle Mode E-UTRA->GERAN reselection procedure without losing service.

Initial configuration

- UE is powered on and in IDLE state (RRC_IDLE)
- UE is registered in E-UTRAN cell (ECM_IDLE & EMM-REGISTERED)
- UE has a default bearer assigned
- There must be a sufficient number of E-UTRAN and GERAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.

Test procedure

1. Move from the coverage area of E-UTRA to the coverage area of GERAN Service.

2. Ensure that the UE performs reselection including a RAU procedure, if ISR is not active, in the GERAN cell as expected. During the reselection it is imperative the UE remains in service at all time.

3. Verify that the UE is attached by setting up a mobile terminated connection.

   If the UE is not capable to setup a mobile terminated service or if the network is not able to maintain the PDP context, verify that the UE is registered to the new Routing Area by setting up a mobile originated connection without establishing a redundant Routing Area Update procedure.

Expected behaviour

2. The UE should perform reselection including a RAU procedure, if ISR is not active, in the GERAN cell correctly, without losing service.

3. The UE establishes a service connection.
31.1.2.2.2 Idle Mode GERAN -> E-UTRA Reselection - PDP Context not active

Description
The UE should perform a reselection without losing service.

Related core specifications
TS 45.008, clause 10.1.3.3 and TS 44.018, clause 3.4.1.2.1.1a

Reason for test
To ensure that the UE performs correctly an Idle Mode 2G->E-UTRA reselection procedure without losing service.

Initial configuration
- UE is powered on and in IDLE state (GSM Idle/GPRS Packet Idle)
- UE is registered in GERAN cell
- PDP context is not active
- There must be a sufficient number of E-UTRAN and GERAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.

Test procedure
1. Move from the coverage areas of GERAN to the coverage area of E-UTRA Service.
2. Ensure that the UE performs a reselection into an E-UTRA cell including an Attach procedure or a TAU procedure which is rejected with cause code #40 (No EPS bearer context activated) followed by an Attach procedure, if ISR is not active. During the reselection it is imperative the UE remains in service at all time.
3. Verify that the UE is connected by using the ‘ping’ command over a default bearer. Depending on the UE this might require to ‘connect’ to the network first from a user perspective despite the attach procedure already includes the default bearer activation.

Expected behaviour
2. The UE should perform the reselection including an Attach procedure, if ISR is not active, in the E-UTRA cell correctly, without losing service.
3. The UE establishes a service connection.

31.1.2.2.3 Idle Mode GERAN -> E-UTRA Reselection - PDP Context active

Description
The UE should perform a reselection without losing service.

Related core specifications
TS 45.008, clause 10.1.3.3 and TS 44.018, clause 3.4.1.2.1.1a

Reason for test
To ensure that the UE performs correctly an Idle Mode 2G->E-UTRA reselection procedure without losing service.

Initial configuration
- UE is powered on and in IDLE state (GSM Idle/GPRS Packet Idle)
- UE is registered in GERAN cell
- PDP context is active
- There must be a sufficient number of E-UTRAN and GERAN cells available on the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.
Test procedure

1. Move from the coverage areas of GERAN to the coverage area of E-UTRA Service.
2. Ensure that the UE performs reselection including a TAU procedure, if ISR is not active, into E-UTRA cell as expected. During the reselection it is imperative the UE remains in service at all time.
3. Verify that the UE is connected by setting up a mobile terminated connection.
   If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered to the new Tracking Area by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure

Expected behaviour

2. The UE should perform the reselection including a TAU procedure, if ISR is not active, in the E-UTRA cell correctly, without losing service.
3. The UE establishes a service connection

31.1.3 Idle Mode FDD E-UTRA -> TDD E-UTRA Reselection

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.1.3.1</td>
<td>FDD E-UTRA -&gt; TDD E-UTRA Reselection</td>
<td>X</td>
</tr>
<tr>
<td>31.1.3.2</td>
<td>TDD E-UTRA -&gt; FDD E-UTRA Reselection</td>
<td>X</td>
</tr>
</tbody>
</table>

Description

The UE should perform a reselection without losing service, including when different PLMN-IDs are used and an EPLMN-ID list is configured in the UE and may use different PLMN-IDs and an EPLMN-ID list is configured in the UE.

Related core specifications

3GPP TS 25.304, clause 5.2.6.1.2a and 5.2.6.1.4a

Reason for test

To ensure that the UE performs correctly an Idle Mode FDD E-UTRA -> TDD E-UTRA reselection procedure without losing service.

Initial configuration

- UE is powered on and in IDLE state (RRC_IDLE)
- PDP Context not active
- UE is registered in FDD E-UTRAN cell
- Tracking area identity is different between FDD and TDD cells. [Note: in this initial case where the FDD & TDD RANs may have separate PLMN IDs, different TAI s will exist by default]
- There must be a sufficient number of FDD E-UTRAN and TDD E-UTRAN cells available on each PLMN respectively. Required packet bearers to be tested should be active and available in all part of the test route.

Test procedure

1. Move from the coverage area of FDD E-UTRA to the coverage area of TDD E-UTRA Service.
2. Ensure that the UE performs reselection including a TAU procedure, into TDD E-UTRA cell as expected. During the reselection, it is imperative that the UE remains in service at all time.
3. Verify that the UE is connected by setting up a mobile terminated connection. If the UE is not capable to set-up a mobile terminated service, verify that the UE is registered to the new...
Tracking Area by setting up a mobile originated connection without establishing a redundant Tracking Area Update procedure.

Scenario A:
Only default bearer is required for the scenario A and only a basic test case.

Expected behaviour
2. The UE should perform reselection including a TAU procedure, in the TDD E-UTRA cell correctly, without losing service.
3. The UE establishes a service connection.

31.1.4 Idle Mode Entry / Exit E-UTRA

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.1.4.1</td>
<td>FDD E-UTRA -&gt; TDD E-UTRA Idle Mode Entry / Exit E-UTRA</td>
<td>X</td>
</tr>
<tr>
<td>31.1.4.2</td>
<td>TDD E-UTRA -&gt; FDD E-UTRA Idle Mode Entry / Exit E-UTRA</td>
<td>X</td>
</tr>
</tbody>
</table>

Description
The UE should perform idle mode entry / exit successfully, including when different PLMN-IDs are broadcast on the FDD & TDD cells and an EPLMN-ID list is configured in the UE.

Related core specifications
3GPP TS36.304

Reason for test
To ensure that the UE performs idle mode entry / exit correctly without losing service.

Initial configuration
There must be a sufficient number of E-UTRAN TDD & FDD cells available on the same PLMN, and the eNodeB is configured to a low idle state entry timer (inactivity timer) for the UEs.

Test procedure
1. Move between the coverage areas of various TDD & FDD cells on a test route.
2. Ensure that UE enters RRC idle state upon receiving the RRC Connection Release Message eNodeB.
3. Ping the UE from the network side and ensure UE enters connected state without losing the service.
4. Alternatively, perform UE initiated idle exit by send pings from the UE to the server.
5. Continue moving around the coverage of different TDD & FDD cells while UE entering / exiting Idle mode.

Scenario A:
Only default bearer is required for the scenario A and only a basic test case.

Expected behaviour
2. The UE should perform Idle mode entry / exit correctly, without losing service, and its PDN connectivity should remain viable before and after the reselections.
3. The UE should successfully establish a mobile terminated service connection.
4. If the UE is not capable to setup a mobile terminated service, verify that the UE can setup a mobile originated connection (e.g. Service Request procedure).
31.2 Handover

31.2.1 E-UTRA Handover

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
<th>Dedicated Bearer (Scenario B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.1.1</td>
<td>E-UTRA Handover, intra eNodeB Handover</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.1.2</td>
<td>E-UTRA Handover, X2 Based¹</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.1.3</td>
<td>E-UTRA Handover, S1 Based²</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.1.4</td>
<td>E-UTRA Handover, inter-MME³</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.1.5</td>
<td>E-UTRA-E-UTRA Inter-frequency (e.g. Band VII-Band VII)⁴</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.1.6</td>
<td>E-UTRA-E-UTRA Inter-frequency, Inter-Band (e.g. Band VII-Band I)⁵</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Description

The UE should perform handovers as requested by the network, and behave as expected from the user perspective without losing services.

Related core specifications

3GPP TS36.300, 3GPP TS 36.331, 3GPP TS 36.423, 3GPP TS 36.413, 3GPP 23.401

Reason for test

To ensure that the UE performs handovers correctly without losing services.

Initial configuration

There must be a sufficient number of E-UTRA cells available on the same PLMN. Required packet bearers to be tested should be active, and available in all parts of the test route.

Test procedure

Move between the coverage areas of different cells on a test route. The test route(s) should contain the scenarios listed in the table above. Ensure that the UE performs reselections/handovers as expected. During the test drive it is imperative the UE remains in service at all times, that the packet bearer in question is maintained throughout the test route and that the FTP download is resumed correctly.

Scenario A:

Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

Scenario B:

Default and dedicated bearer are required for the scenario B and only a basic test case (e.g. Voice over LTE (VoLTE), default bearer is required for setup of dedicated bearer with QCI=1 for Voice over LTE call).

Expected behaviour

The UE should perform handovers correctly, without losing service, and its PDN connectivity should remain viable before and after the handovers. The UE should successfully resume the FTP downloads or Voice over LTE Calls after the handovers.

---

¹ This scenario is designed to test inter eNB Handovers – X2 Based
² This scenario is designed to test inter eNB Handovers – S1 Based (no X2 interface between eNB)
³ This scenario is designed to test inter MME Handovers
⁴ This scenario is designed to test inter eNB Handovers with cells belonging to different E-UTRA ARFCN within common band
⁵ This scenario is designed to test inter eNB Handovers with cells belonging to different E-UTRA ARFCN and different E-UTRA band.
31.2.2 Inter RAT Handover

31.2.2.1 E-UTRA <-> UTRA Handover, PS Data Transfer & Voice Call (VoLTE)

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>FTP Download (Scenario A)</th>
<th>Voice Call active (VoLTE) (Scenario B)</th>
<th>FTP Download &amp; Voice Call active (VoLTE) (Scenario C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.2.1.1</td>
<td>E-UTRA -&gt; UTRA Handover&lt;sup&gt;1&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31.2.2.1.2</td>
<td>UTRA -&gt; E-UTRA Handover&lt;sup&gt;2&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Description**

The UE should perform Inter RAT handovers as requested by the network, and behave as expected from the user perspective without losing services.

**Related core specifications**

TS 36.331, clause 5.4.3.3, clause 5.4.2.3

**Reason for test**

To ensure that the UE performs Inter RAT handovers correctly without losing services.

**Initial configuration**

- There must be a sufficient number of E-UTRA and UTRA cells available on the same PLMN. Required packet bearers to be tested should be active, and available in all parts of the test route.
- UE is registered
- UE has a packet bearer assigned
- Download of a file with sufficient size from FTP server and/or Voice over LTE call set up and running

**Test procedure**

Move between the coverage areas of different cells on a test route. The test route(s) should contain the scenarios listed in the table above. Ensure that the UE performs handovers as expected. During the test drive it is imperative the UE remains in service at all times, that the IP connection in question is maintained throughout the test route, that the FTP download is resumed correctly.

**Scenario A:**

Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

**Scenario B:**

Default and dedicated bearer are required for the scenario B and only a basic test case (e.g. Voice over LTE (VoLTE), default bearer is required for setup of dedicated bearer with QCI=1 for Voice over LTE call).

**Scenario C:**

Default and dedicated bearer for FTP download and Voice over LTE call (VoLTE) are required for the scenario C. This scenario requires both services to be active in parallel.

**Expected behaviour**

The UE should perform handovers correctly, without losing service, and its Packet connectivity should remain viable before and after the handovers. The UE should successfully continue the FTP downloads (or/and VoLTE calls) after the handovers.

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<sup>1</sup> This scenario is designed to test inter RAT Handovers – E-UTRA -> UTRA

<sup>2</sup> This scenario is designed to test inter RAT Handovers – UTRA -> E-UTRA
31.2.2.2  E-UTRA <-> GERAN Handover, PS Data Transfer

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.2.2.1</td>
<td>E-UTRA -&gt; GERAN Handover, FTP Download ¹</td>
<td>X</td>
</tr>
<tr>
<td>31.2.2.2.2</td>
<td>GERAN -&gt; E-UTRA Handover, FTP Download ²</td>
<td>X</td>
</tr>
</tbody>
</table>

Description
The UE should perform Inter RAT handovers as requested by the network, and behave as expected from the user perspective without losing services.

Related core specifications
TS 36.331, clause 5.4.3.3, clause 5.4.2.3

Reason for test
To ensure that the UE performs Inter RAT handovers correctly without losing services.

Initial configuration
- There must be a sufficient number of E-UTRA and GERAN cells available on the same PLMN.
- Required packet bearers to be tested should be active, and available in all parts of the test route.
- UE is registered
- UE has a default bearer assigned
- Download of a file with sufficient size from FTP server set up and running

Test procedure
Move between the coverage areas of different cells on a test route. The test route(s) should contain the scenarios listed in the table above. Ensure that the UE performs reselections/handovers as expected. During the test drive it is imperative the UE remains in service at all times, that the packet bearer in question is maintained throughout the test route and that the FTP download is resumed correctly.

Scenario A:
Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

Expected behaviour
The UE should perform handovers correctly, without losing service, and its PDP context should remain viable before and after the handovers. The UE should successfully resume the FTP downloads after the handovers.

31.2.3  RRC Connection Release with Redirect

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.3.1</td>
<td>E-UTRA -&gt; UTRA RRC Connection Release with Redirect</td>
<td>X</td>
</tr>
<tr>
<td>31.2.3.2</td>
<td>E-UTRA -&gt; GERAN RRC Connection Release with Redirect</td>
<td>X</td>
</tr>
</tbody>
</table>

Description
In case the network and/or UE does not support Inter-RAT handover procedures at the edge of an E-UTRAN coverage area and the network instead sends an RRC Connection Release with redirection to UTRAN (31.2.3.1) or GERAN (31.2.3.2), the UE should reselect to the given UTRAN or GERAN cell and re-establish the connection. The data transfer is interrupted during the procedure but continues once the UE is connected via UTRAN or GERAN.

¹ This scenario is designed to test inter RAT Handovers – E-UTRA -> GERAN
² This scenario is designed to test inter RAT Handovers – GERAN ->E-UTRA
Related core specifications
TS 36.331, clause 4.2.1
TS 36.331, clause 6.2.2, RRC Connection Release Message definition
TS 36.331, Annex B.1, Table B.1-2
TS 36.304, clause 5.2.7, Cell Selection when leaving RRC_CONNECTED State

Reason for test
To ensure that the UE correctly performs a directed cell reselection to 3G as indicated in the RRC Connection Release Message.

Initial configuration
- There must be at least one E-UTRAN and one UTRAN (31.2.3.1) or GERAN (31.2.3.2) cell available of the same PLMN. Required packet bearers to be tested should be active and available in all parts of the test route.
- UE is registered
- UE has a default bearer assigned
- Download of a file with a sufficient size from FTP server set up and running

Test procedure
Move between the coverage areas of different cells of the different RATs. The test route has to cross the border area between an E-UTRA coverage area and a UTRAN (31.2.3.1) or GERAN (31.2.3.2) coverage area. Ensure that the UE executes the RRC Connection Release with redirection information properly either with measurements or without measurements of the UTRAN or GERAN layer prior to the RRC Connection Release depending on the support of the network and the UE.

Scenario A:
Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

Expected behaviour
The UE performs the redirection correctly without losing service and its PDP context remains active before and after the redirection. The UE resumes the FTP downloads after the redirection.

31.2.4 TDD / FDD E-UTRA Handover

31.2.4.1 TDD / FDD E-UTRA Handover (Release / Redirect)

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.4.1.1</td>
<td>FDD E-UTRA -&gt; TDD E-UTRA RRC Connection Release with Redirect</td>
<td>X</td>
</tr>
<tr>
<td>31.2.4.1.2</td>
<td>TDD E-UTRA -&gt; FDD E-UTRA RRC Connection Release with Redirect</td>
<td>X</td>
</tr>
</tbody>
</table>

Description
In case the network and/or UE does not support RRC connected state FDD/TDD handover procedures at the edge of coverage area and the network instead sends an RRC Connection Release with redirection to other E-UTRA mode, the UE should reselect a FDD/TDD E-UTRA cell of the redirected carrier frequency and re-establish the connection. The data transfer is interrupted during the procedure but continues once the UE is connected to the redirected cell. Please note there may be different PLMN-IDs used and a EPLMN-ID list is configured in the UE.

Related core specifications
3GPP TS 36.331, clause 4.2.1
3GPP TS 36.331, clause 6.2.2, RRC Connection Release Message definition
3GPP TS 36.331, Annex B.1, Table B.1-2
3GPP TS 36.304, clause 5.2.7, Cell Selection when leaving RRC_CONNECTED State

Reason for test
To ensure that the UE correctly performs a directed cell reselection to FDD/TDD E-UTRA cell as indicated in the RRC Connection Release Message.

Initial configuration
- There must be at least one FDD E-UTRAN and one TDD E-UTRAN cell available. Required packet bearers to be tested should be active and available in all parts of the test route.
- UE is registered on the FDD cell (test case x.1) or on the TDD cell (test case x.2) and EPLMN-ID list is configured with the PLMN-IDs in use.
- UE has a default bearer assigned
- Download of a file with a sufficient size from FTP server set up and running.

Test procedure
Move between the coverage areas of different TDD / FDD cells on a test route. The test route(s) has to cross the border area between TDD E-UTRA coverage area and FDD E-UTRA coverage area. Ensure that the UE executes the RRC Connection Release with redirection information properly with measurements of TDD / FDD cells prior to the RRC Connection Release depending on the support of the network and the UE.

Scenario A:
Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

Expected behaviour
The UE performs the redirection correctly without losing service and its context remains active before and after the redirection. The UE resumes the FTP downloads after the redirection.

31.2.4.2 TDD / FDD E-UTRA Handover (RRC Connected state)

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Default Bearer (Scenario A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2.4.2.1</td>
<td>FDD E-UTRA -&gt; TDD E-UTRA RRC Connected state Handover, FTP download</td>
<td>X</td>
</tr>
<tr>
<td>31.2.4.2.2</td>
<td>TDD E-UTRA -&gt; FDD E-UTRA RRC Connected state Handover, FTP download</td>
<td>X</td>
</tr>
</tbody>
</table>

Description
The UE should perform FDD / TDD E-UTRAN handovers as requested by the network, and behave as expected from the user perspective without losing services, and may use different PLMN-IDs and an EPLMN-ID list is configured in the UE.

Related core specifications
3GPP TS36.300
3GPP TS 36.331
3GPP TS 36.423
3GPP TS 36.413
3GPP TS 23.401

Reason for test
To ensure that the UE performs FDD / TDD E-UTRAN handovers correctly without losing services.
Initial configuration

- There must be sufficient number of FDD E-UTRAN and TDD E-UTRAN cell available on each PLMN respectively. Required packet bearers to be tested should be active and available in all parts of the test route.
- UE is registered on the FDD cell (test case x.1) or on the TDD cell (test case x.2) and EPLMN-ID list is configured with the PLMN-IDs in use. UE has a default bearer assigned.
- Download of a file with a sufficient size from FTP server set up and running.

Test procedure

Move between the coverage areas of different TDD / FDD cells on a test route. The test route(s) has to cross the border area between TDD E-UTRA coverage area and FDD E-UTRA coverage area. Ensure that the UE performs reselections/handovers as expected. During the test drive, it is imperative the UE remains in service at all times, that the packet bearer in question is maintained throughout the test route and that the FTP download is resumed correctly.

Scenario A:

Only default bearer is required for the scenario A and only a basic test case (e.g. FTP Download).

Expected behaviour

The UE should perform FDD / TDD E-UTRAN handovers correctly, without losing service, and its PDN connectivity should remain viable before and after the handovers. The UE should successfully resume the FTP downloads after the handovers.

31.3 PS performances (During Mobility Drive Tests - Relative Measurement)

31.3.1 Throughput Measure - Downlink FTP

**NOTE:** This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeBs). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible. The route must assure continuous driving of at least 30 minutes and involves multiple handovers (more than 6) to multiple eNodeBs (more than 3).

Description

Measure the average downlink throughput for a E-UTRA E-RAB while moving.

Related 3GPP core specifications

3GPP TS 36.331

Reason for test

To ensure for an E-UTRA E-RAB, the average downlink throughput of the DUT is comparable to that of a reference UE during mobility.

Initial configuration

The DUT and reference device shall

- have identical DL/UL capabilities and be in a good coverage area
- have an EPS Bearer on their HPLMN accessible by an FTP client [either built-in or external application]

The route should guarantee at least 30 minutes of driving.

File size should be as large as possible.

Test procedure

1. Setup an FTP session to a controlled FTP site on both DUT and reference device.
2. Start an FTP download for DUT and reference device using the E-UTRA E-RAB. Use a large incompressible file based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW.

3. Start moving between cells on the route.

4. Measure the average throughput using a suitable application.

5. Ensure that downloading continues throughout the route, restart download when necessary, ensure that the time between downloads does not cause the expiry of any inactivity timers, thus keeping the data session active.

**Expected behaviour**

The average throughput over all downloads on DUT shall be comparable with the result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

Report the obtained throughput value for DUT and reference device.

### 31.3.2 Throughput Measure - Uplink FTP

**NOTE:** This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeBs). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible. The route must assure continuous driving of at least 30 minutes and involves multiple handovers (more than 6) to multiple eNodeBs (more than 3).

**Description**

Measure the average uplink throughput for a E-UTRA E-RAB while moving.

**Related 3GPP core specifications**

3GPP TS 36.331

**Reason for test**

To ensure for an E-UTRA E-RAB, the average uplink throughput of the DUT is comparable to that of a reference UE during mobility.

**Initial configuration**

The DUT and reference device shall

- have identical DL/UL capabilities and be in a good coverage area
- have an EPS Bearer on their HPLMN accessible by an FTP client [either built-in or external application].

The route should guarantee at least 30 minutes of driving.

File size should be as large as possible.

**Test procedure**

1. Setup an FTP session to a controlled FTP site on both DUT and reference device.
2. Start an FTP upload for DUT and reference device using the E-UTRA E-RAB. Use a large incompressible file based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW. Ensure that both devices upload to a different folder on the FTP server.
3. Start moving between cells on the route.
4. Measure the average throughput using a suitable application.
5. Ensure that uploading continues throughout the route, restart upload when necessary, ensure that the time between uploads does not cause the expiry of any inactivity timers, thus keeping the data session active.
Expected behaviour
The average throughput over all uploads on DUT shall be comparable with the result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

Report the obtained throughput value for DUT and reference device.

31.3.3 Throughput Measure - Downlink & Uplink FTP

NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeBs). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible. The route must assure continuous driving of at least 30 minutes and involves multiple handovers (more than 6) to multiple eNodeBs (more than 3).

Description
Measure the average simultaneous uplink and downlink throughput for a E-UTRA E-RAB while moving.

Related 3GPP core specifications
3GPP TS 36.331

Reason for test
To ensure for an E-UTRA E-RAB, the average simultaneous downlink and uplink throughput of the DUT is comparable to that of a reference UE during mobility.

Initial configuration
The DUT and reference device shall

- have identical DL/UL capabilities and be in a good coverage area
- have similar TCP stack behaviour (e.g. TCP Ack preference)
- have an EPS Bearer on their HPLMN accessible by an FTP client [either built-in or external application]

The route should guarantee at least 30 minutes of driving.

File size should be as large as possible.

Test procedure
1. Setup an FTP session to a controlled FTP site on both DUT and reference device.
2. Start an FTP upload for DUT and reference device using the E-UTRA E-RAB. Use a large incompressible file based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW. Ensure that both devices upload to a different folder on the FTP server.
3. Start an FTP download for DUT and reference device using the E-UTRA E-RAB. Use a large uncompressible file based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW
4. Start moving between cells on the route.
5. Measure the average throughput using a suitable application.
6. Ensure that uploading and downloading continues throughout the route, restart upload and download when necessary, ensure that the time between uploads and downloads does not cause the expiry of any inactivity timers, thus keeping the data session active.

Expected behaviour
The average throughput over all uploads and downloads on DUT shall be comparable with the result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.
32 PS Data

32.1 EPS Session Management Procedures

32.1.1 PDN Connectivity Request - ESM Information transfer flag=TRUE

Description
In case if UE wants to include the APN name in PDN Connectivity request and/or usage of default APN requires PAP/CHAP – UE shall include ESM Information transfer flag = TRUE

Related core specifications
3GPP TS 24.301, clause 6.5.1.2

Reason for test
To verify that UE is correctly setting ESM Information transfer flag and additional information like APN name and PAP/CHAP information is exchanged using ESM INFORMATION procedure

Initial configuration
UE is powered off
APN name is explicitly configured on UE side
Usage of APN requires PAP/CHAP Authentication
PAP/CHAP Username/password is configured on UE side.

Test procedure
1. Power on the UE.
2. Verify that PDN Connectivity is functional to the network where this APN gives access to (e.g. loading a designated HTML page, which is only accessible via this network).

Expected behaviour
1. If possible use a diagnostic tool to verify that the UE sends ESM Information Transfer flag = TRUE in “PDN CONNECTIVITY REQUEST”.
   The network shall respond to the UE with a ESM INFORMATION REQUEST message
   After UE replies with ESM INFORMATION RESPONSE containing APN IE and PCO (Protocol Configuration Options), the network shall respond to the UE with an “RRCCConnectionReconfiguration” message that contains the “EPS Radio Bearer Identity” and the APN for a default bearer.
2. The PDN connectivity is functional to the network.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(ATTACH REQUEST(PDN CONNECTIVITY REQUEST))</td>
<td>RRC(EMM(ESM)) ESM Information transfer flag=TRUE</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(OPTIONAL)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>ESM INFORMATION REQUEST</td>
<td>ESM</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>ESM INFORMATION RESPONSE</td>
<td>ESM</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>UECapabilityEnquiry</td>
<td>RRC</td>
</tr>
<tr>
<td>12</td>
<td>→</td>
<td>UECapabilityInformation</td>
<td>RRC</td>
</tr>
</tbody>
</table>
### 32.1.2 Multiple PDN Connections - Second PDN Connectivity Request

**Description**
Verify that the UE can successfully activate a second PDN Connection

**Related core specifications**
3GPP TS 24.301, section 6.5.1, 3GPP TS 23.401, section 5.10

**Reason for test**
To ensure the UE is able to have multiple PDN connections correctly established.

**Initial configuration**
- UE is in EMM-REGISTERED state.
- UE subscription has multiple APNs.

**Test procedure**
Initiate a second PDN connectivity request, for example by means of an embedded web browser or DUN connection and specify explicitly an APN name different than default one.

**Expected behaviour**
Verify transfer of user data using second PDN (for example)
- In case of embedded web browser, try to open a known web page
- In case of DUN Connection, ping a known reachable IP address

**Example message flow:**

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>→</td>
<td>RRCConnectionRequest</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRCConnectionSetup</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>3</td>
<td>→</td>
<td>RRCConnectionSetupComplete(SERVICE REQUEST)</td>
<td>RRC(EMM)(Optional)</td>
</tr>
<tr>
<td>4</td>
<td>←</td>
<td>IDENTITY REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>→</td>
<td>IDENTITY RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>←</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>→</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>←</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>9</td>
<td>→</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>←</td>
<td>SecurityModeCommand</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>11</td>
<td>→</td>
<td>SecurityModeComplete</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>12</td>
<td>←</td>
<td>RRCConnectionReconfiguration</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>13</td>
<td>→</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>14</td>
<td>→</td>
<td>PDN CONNECTIVITY REQUEST</td>
<td>ESM</td>
</tr>
<tr>
<td>15</td>
<td>←</td>
<td>RRCConnectionReconfiguration [ ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST]</td>
<td>RRC(EMM, ESM)</td>
</tr>
<tr>
<td>16</td>
<td>→</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRC(EMM, ESM)</td>
</tr>
</tbody>
</table>
32.1.3 Multiple PDN Connections - Second PDN Connectivity Disconnect

Description
Verify that the UE can successfully deactivate second PDN Connection.

Related core specifications
3GPP TS 24.301, section 6.5.2, 3GPP TS 23.401, section 5.10

Reason for test
To ensure that the UE is able to deactivate a second PDN Connection correctly while maintaining the former PDN Connection active.

Initial configuration
UE is in EMM-REGISTERED state.
UE has already two active PDN Connections by means of, respectively, an externally initiated packet data session and an embedded browser session.

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Verify that an embedded browser session is already established.
3. Manage to deactivate one of the primary PDP contexts (e.g. Terminate DUN session).
4. Verify that DUN session is not active.
5. Verify that the other PDP connection is still active (e.g. try to open a known web page)

Expected behaviour
The UE shall be able to deactivate one of the PDN connections while maintaining the other PDN Connection active.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction UE - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>➔</td>
<td>PDN DISCONNECT REQUEST</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION RECONFIGURATION [DEACTIVATE EPS BEARER CONTEXT REQUEST]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>➔</td>
<td>RRC CONNECTION RECONFIGURATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>➔</td>
<td>DEACTIVATE EPS BEARER CONTEXT ACCEPT</td>
<td></td>
</tr>
</tbody>
</table>

32.1.4 Multiple PDN Connections - PDN Connectivity Reject, cause #27

Description
Verify that the UE inform the user of reject of PDN connectivity establishment

Related core specifications
3GPP TS 24.301, section 6.5.1.4
Reason for test
To ensure that the UE is not able to achieve PDN connectivity with an unknown APN.

Initial configuration
UE is in EMM-REGISTERED state.

Test procedure
1. Initiate a secondary PDN connectivity request, for example by means of an embedded web browser or DUN connection and specify explicitly an APN name different than default one.
2. MME reject PDN CONNECTIVITY REQUEST with cause #27 “Missing or unknown APN”

Expected behaviour
At step 2 - Verify that the user is informed for unsuccessful PDN Connectivity request

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R</td>
<td>RRCConnectionRequest</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>RRCConnectionSetup</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>3</td>
<td>R</td>
<td>RRCConnectionSetupComplete</td>
<td>RRC(EMM)(Optional)</td>
</tr>
<tr>
<td>4</td>
<td>L</td>
<td>IDENTITY REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>IDENTITY RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>6</td>
<td>L</td>
<td>AUTHENTICATION REQUEST</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>7</td>
<td>R</td>
<td>AUTHENTICATION RESPONSE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>8</td>
<td>L</td>
<td>SECURITY MODE COMMAND</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>9</td>
<td>R</td>
<td>SECURITY MODE COMPLETE</td>
<td>EMM(Optional)</td>
</tr>
<tr>
<td>10</td>
<td>L</td>
<td>SecurityModeCommand</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>11</td>
<td>R</td>
<td>SecurityModeComplete</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>12</td>
<td>L</td>
<td>RRCConnectionReconfiguration</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>13</td>
<td>R</td>
<td>RRCConnectionReconfigurationComplete</td>
<td>RRC(Optional)</td>
</tr>
<tr>
<td>14</td>
<td>R</td>
<td>PDN CONNECTIVITY REQUEST</td>
<td>ESM</td>
</tr>
<tr>
<td>15</td>
<td>R</td>
<td>PDN CONNECTIVITY REJECT, CAUSE 27</td>
<td>ESM</td>
</tr>
</tbody>
</table>

Note: RRC procedures are optional in case if UE is in RRC_CONNECTED state.

32.1.5 Dedicated Bearer Activation - UE requested bearer resource allocation

Description
To verify that the UE can successfully request dedicated resource allocation for specific QoS demand. Applicable to UEs supporting UE initiated bearer resource modification

Related core specifications
3GPP TS 24.301, section 6.5.3, 3GPP TS 23.401, section 5.4.5

Reason for test
To ensure that the UE is able to request and use successfully dedicated EPS bearer.

Initial configuration
UE is in EMM-REGISTERED state.
UE is actively using a default EPS bearer (e.g. on-going traffic on DUN connection)

Test procedure
1. Verify that an externally initiated packet data session is already established.
2. Browse through HTML pages.
3. Promote the activation of a dedicated EPS bearer, for example, by:
- Initiating a streaming session using an embedded client, or
- Initiating an e-mail synchronization using embedded e-mail client

Expected behaviour

At step 3 – verify that User plane correctly functions for required applications.

Example message flow:

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>🔄</td>
<td>BEARER RESOURCE ALLOCATION REQUEST</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>←</td>
<td>RRC CONNECTION RECONFIGURATION [ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>🔄</td>
<td>RRC CONNECTION RECONFIGURATION COMPLETE</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>🔄</td>
<td>ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT</td>
<td></td>
</tr>
</tbody>
</table>

32.2 Basic Traffic Cases

32.2.1 Ping a Remote Destination

Description
The UE pings a known destination (IP address or domain name) using an EPS default bearer in order to verify functionality.

Related core specifications
3GPP TS 36.331

Reason for test
To ensure that the UE is able to send a ping to a known destination.

Initial configuration
The UE is attached to the network and has an always-on IP connectivity after establishing a default EPS bearer during Network Attachment.

Test procedure
1. Start a ping procedure (ping –t [-l size] [-w timeout] destination, for e.g. ping –t –l 100 –w 1000 10.11.26.52).
2. Verify that the replies from the ping commands are correctly received.
3. Stop ping procedure.

Expected behaviour
The UE shall be able to ping the known destination.

32.2.2 HTTP Browsing

Description
Measure the time the UE takes to correctly download and render a Web page containing pictures, text and CSS formatting.

This test is possible if embedded browsing application of UE supports HTML format. Alternatively the download can be performed from an external device (e.g. a laptop) tethered to the UE.

Related 3GPP core specifications
3GPP TS 36.331
Reason for test
To ensure that the UE guarantees an acceptable performance in case of repeated downloads of small size files, such as HTML pages.

Two test procedures are defined, one to give an indication of the download speed and one to give an indication of the download speed and the time taken to perform state transitions.

Initial configuration
The UE is attached to the network and has an always-on IP connectivity after establishing a default EPS bearer during Network Attachment.

Test procedure
1. Manage on the UE (or on the external device) to download the same reference web page
   a) rapidly 10 times in a row.
   b) 3 times in a row leaving a sufficient pause between each download to revert to idle mode.

   Ensure that the page is downloaded from the network each time and not just loaded from the browser cache

2. Verify that the download of the page is correct each time (number of elements)

3. Measure the time to download the WEB pages and calculate the average download time per page.

Expected behaviour
The UE shall be able to download a reference Web page within a reasonable period of time when average is compared to other UEs on the same network.

32.2.3 FTP Downlink

Description
The UE performs a FTP download using an EPS bearer in order to verify functionality.

Related core specifications
3GPP TS 36.331

Reason for test
To ensure that the UE is able to perform an FTP download.

Initial configuration
The UE is attached to the network and has an always-on IP connectivity after establishing a default EPS bearer during Network Attachment.

Test procedure
1. Connect to a known FTP Server using an FTP client or using DOS command (FTP <FTP-Server>)

2. Manage to download a file.

Expected behaviour
1. The UE shall be able to connect to the FTP server.

2. The UE shall be able to successfully download a file.

32.2.4 FTP Uplink

Description
The UE performs a FTP upload using an EPS bearer in order to verify functionality.

Related core specifications
3GPP TS 36.331
Reason for test
To ensure that the UE is able to perform an FTP upload.

Initial configuration
The UE is attached to the network and has an always-on IP connectivity after establishing a default EPS bearer during Network Attachment.

Test procedure
1. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload content.
2. Manage to upload a file.

Expected behaviour
1. The UE shall be able to connect to the FTP server.
2. The UE shall be able to successfully upload a file.

32.2.5 Simultaneous FTP downlink and FTP Uplink

NOTE: The TCP RX window size of both the laptop and FTP server shall be set appropriately so that optimum simultaneous Uplink and Downlink performance is achieved. If the TCP RX window size of the FTP server cannot be set to an optimum configuration by the tester, then an application using the UDP protocol may be utilised to perform this test case.

Description
The UE performs a simultaneous FTP upload and download using appropriate EPS bearers in order to verify functionality.

Related 3GPP core specifications
3GPP TS 36.331

Reason for test
To ensure that the UE is able to perform an FTP upload and FTP download simultaneously.

Initial configuration
The UE is attached to the network and has an always-on IP connectivity after establishing a default EPS bearer during Network Attachment.

Test procedure
1. Connect to a known FTP Server using an FTP client or using DOS command. Assure the permission to upload content.
2. Open another FTP connection.
3. Manage to upload a file.
4. Manage to download other file while upload is on-going.

Expected behaviour
1. The UE shall be able to connect to the FTP server.
2. The UE shall be able to establish the second connection to FTP server.
3. Upload shall be proceeding.
4. The simultaneous upload and download of the files shall be completed successfully.
32.3 PS performances

32.3.1 PS performances (good coverage - relative measurement)

32.3.1.1 Throughput Measure - Downlink FTP

NOTE: This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeB). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible.

Description
Measure the average downlink throughput for a E-UTRA E-RAB

Related 3GPP core specifications
3GPP TS 36.331

Reason for test
To ensure for an E-UTRA E-RAB, the average downlink throughput of the DUT is comparable to that of a reference UE.

Initial configuration
The DUT and Reference UE shall
- have identical DL/UL capabilities and be in a good coverage area
- have an EPS Bearer on their HPLMN accessible by an FTP client [either built-in or external application].

Test procedure
1. Setup an FTP/TFTP session to a controlled FTP site.
2. Start a FTP/TFTP download for the reference device using the E-UTRA E-RAB. Use an incompressible file sufficient for at least 60 seconds of data transfer based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW.
3. Measure the average throughput using a suitable application.
4. Repeat steps from 1 to 3 for the DUT.
5. Perform 15 times the steps from 1 to 4, selecting the best result for both DUT and reference device. Ensure that the time between runs does not cause the expiry of any inactivity timers, thus keeping the data session active.

Expected behaviour
The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the capability of the devices

Report the obtained throughput value for DUT and reference mobile.

<table>
<thead>
<tr>
<th>Downlink</th>
<th>Bandwidth</th>
<th>Advertised Throughput FDD (ref. 3GPP 36.306)</th>
<th>Minimum Realistic Throughput in field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 5</td>
<td>5 MHz</td>
<td>75 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 4</td>
<td>5 MHz</td>
<td>37.5 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 3</td>
<td>5 MHz</td>
<td>25 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 2</td>
<td>5 MHz</td>
<td>12.5 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 1</td>
<td>5 MHz</td>
<td>2.5 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 5</td>
<td>10 MHz</td>
<td>150 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 4</td>
<td>10 MHz</td>
<td>75 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Downlink</td>
<td>Bandwidth</td>
<td>Advertised Throughput FDD (ref. 3GPP 36.306)</td>
<td>Minimum Realistic Throughput in field</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Cat 3</td>
<td>10 MHz</td>
<td>50 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 2</td>
<td>10 MHz</td>
<td>25 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 1</td>
<td>10 MHz</td>
<td>5 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 5</td>
<td>20 MHz</td>
<td>300 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 4</td>
<td>20 MHz</td>
<td>150 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 3</td>
<td>20 MHz</td>
<td>100 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 2</td>
<td>20 MHz</td>
<td>50 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 1</td>
<td>20 MHz</td>
<td>10 Mbit/s [TBD]</td>
<td>[TBD]</td>
</tr>
</tbody>
</table>

### 32.3.1.2 Throughput Measure - Uplink FTP

**NOTE:** This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeB). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible.

**Description**

Measure the average uplink throughput for a E-UTRA E-RAB

**Related 3GPP core specifications**

3GPP TS 36.331

**Reason for test**

To ensure for an E-UTRA E-RAB, the average uplink throughput of the DUT is comparable to that of a reference UE.

**Initial configuration**

The DUT and Reference UE shall

- have identical DL/UL capabilities and be in a good coverage area
- have an EPS Bearer on their HPLMN accessible by an FTP client [either built-in or external application].

**Test procedure**

1. Setup an FTP/TFTP session to a controlled FTP site.
2. Start a FTP/TFTP upload for the reference device using the E-UTRA E-RAB. Use an incompressible file sufficient for at least 60 seconds of data transfer based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW.
3. Measure the average throughput using a suitable application.
4. Repeat steps from 1 to 3 for the DUT.
5. Perform 15 times the steps from 1 to 4, selecting the best result for both DUT and reference device. Ensure that the time between runs does not cause the expiry of any inactivity timers, thus keeping the data session active.

**Expected behaviour**

The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

The test is considered conclusive only if the throughput of the Reference Device or the DUT is higher than the Minimum Realistic Throughput value described below, depending on the capability of the devices.

Report the obtained throughput value for DUT and reference mobile.
### 32.3.1.3 Throughput Measure - Downlink & Uplink FTP

**NOTE:** This test needs to be conducted with optimal conditions (optimum RF signal, low traffic hours to avoid contention with other UEs, sufficient bandwidth of eNodeB). Use load balancing means to ensure proper data rates being delivered by the FTP server if possible.

#### Description

Measure the average downlink and uplink throughput for a E-UTRA E-RAB during simultaneous bidirectional data transfer.

#### Related 3GPP core specifications

3GPP TS 36.331

#### Reason for test

To ensure for an E-UTRA E-RAB, the average simultaneous downlink and uplink throughput of the DUT is comparable to that of a reference UE.

#### Initial configuration

The DUT and Reference UE shall

- have identical DL/UL capabilities and be in a good coverage area
- have similar TCP stack behaviour (e.g. TCP Ack preference)
- have an EPS Bearer on their HPLMN by accessible by an FTP client [either built-in or external application].

#### Test procedure

1. Setup an FTP/TFTP session to a controlled FTP site.
2. Start a FTP/TFTP download for the reference device using the E-UTRA E-RAB. Use an incompressible file sufficient for at least 60 seconds of data transfer based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW.
3. Start a FTP upload for the reference device using the E-UTRA E-RAB. Use an incompressible file sufficient for at least 60 seconds of data transfer based on the available E-RAB. If possible, utilize a server with minimal latency to the P-GW.
4. Measure the average throughput using a suitable application.
5. Repeat steps from 1 to 4 for the DUT.
6. Perform 15 times the steps from 1 to 5, selecting the best result for both DUT and reference device. Ensure that the time between runs does not cause the expiry of any inactivity timers, thus keeping the data session active.

**Expected behaviour**

The best result on DUT shall be comparable with the best result of the reference mobile (no more than 10% worse), and shall be proportional to the E-UTRA capability of the device and the E-UTRA E-RAB available of the cell used.

Report the obtained throughput value for DUT and reference mobile.

### 32.3.2 PS performances (good coverage - absolute measurement)

**NOTE:** These tests needs to be conducted under lab conditions (optimum RF signal, no contention with other UEs, sufficient bandwidth of eNodeB).

#### 32.3.2.1 Throughput Measure - Downlink FTP

**Description**

This test verifies that the UE can successfully complete an FTP (or TFTP) download during an active E-UTRA data call with sufficient Data Throughput.

**Related core specifications**

3GPP TS 36.211, 3GPP TS 36.212, 3GPP TS 36.213, 3GPP TS 36.321

**Reason for test**

To ensure the UE is able to perform an FTP/TFTP download in a good coverage area with sufficient Data Throughput.

**Initial configuration**

Check the Lab Environment with a Reference Device (recommended by an Operator) to ensure that the Minimum Realistic Throughput Values can be achieved.

Connect the DUT to a PC and use it as a modem. Ensure that the Connection Manager from the device supplier is used. Where possible, the DUT shall be connected via USB.

The UE is attached to the network and has an always-on IP connection over a default EPS bearer to the P-GW that is connected to the internet.

**Test procedure**

1. Set up an FTP/TFTP session to a controlled FTP site using a suitable application.
2. Initiate the download of an uncompressible file sufficient for at least 60 seconds of data transfer, from the remote host to the UE. If possible utilize a server with minimal latency to the P-GW.
3. Measure the average throughput using the application. If possible, use a diagnostic tool to record the resource block allocations and modulation scheme used.
4. Repeat steps 3-4, fourteen more times, for a total of 15 transfers. Ensure that the time between runs does not cause the expiry of any inactivity timers, thus keeping the data session active.

**Expected behaviour**

The UE shall download the test file with a minimal average throughput as specified in the following table.

<table>
<thead>
<tr>
<th>Downlink</th>
<th>Bandwidth</th>
<th>Advertised Throughput FDD (ref. 3GPP 36.306)</th>
<th>Minimum Throughput</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 5</td>
<td>5 MHz</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Cat 4</td>
<td>5 MHz</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Cat 3</td>
<td>5 MHz</td>
<td>35 Mbit/s</td>
<td>TBD</td>
</tr>
<tr>
<td>Cat 2</td>
<td>5 MHz</td>
<td>25 Mbit/s</td>
<td>TBD</td>
</tr>
</tbody>
</table>
32.3.2.2 Throughput Measure - Uplink FTP

Description
This test verifies that the UE can successfully complete an FTP (or TFTP) upload during an active E-UTRA data call.

Related core specifications
3GPP TS 36.211, 3GPP TS 36.212, 3GPP TS 36.213, 3GPP TS 36.321

Reason for test
To ensure the UE is able to perform an FTP upload in a good coverage area.

Initial configuration
The UE is attached to the network and has an always-on IP connection over a default EPS bearer to the P-GW that is connected to the internet.

Test procedure
1. Setup an FTP/TFTP session to a controlled FTP site using a suitable application.
2. Initiate the upload of an uncompressible file sufficient for at least 60 seconds of data transfer, from the UE to the remote host. If possible utilize a server with minimal latency to the P-GW.
3. Measure the average throughput using the application. If possible, use a diagnostic tool to record the resource block allocations and modulation scheme used.
4. Repeat steps 3-4, fourteen more times, for a total of 15 transfers. Ensure that the time between runs does not cause the expiry of any inactivity timers, thus keeping the data session active.

Expected behaviour
The UE shall upload the test file with a minimal average throughput to be determined by the carrier.
### 33 VOID

**NOTE:** This section formerly contained ‘UICC/USIM Aspects’. It is now combined with ‘UICC/USIM Aspects and SIM/USIM Interworking’ and moved to Annex D, section 57.

### 34 E-UTRA Voice

#### 34.1 CS Fall Back

##### 34.1.1 Mobile Originated voice call with CS fallback, Successful

**Description**
The UE shall successfully perform a Mobile Originated voice call with CS fallback to 2G or 3G.

**Related core specifications**
3GPP TS 23.272 (v9.2.0)

**Reason for test**
To verify that the UE successfully performs a Mobile Originated voice call with CS fallback.

**Initial configuration**
E-UTRAN, and UTRAN or GERAN cells are available.

The NW shall support one or more of the following CS fallback types for voice calls:

- **For Scenario A:**
  - Blind CS fallback to 2G

- **For Scenario B:**
  - Blind CS fallback to 3G

- **For Scenario C:**
  - CS fallback to 2G with System Info (RIM)

- **For Scenario D:**
  - CS fallback to 3G with System Info (RIM)

- **For Scenario E:**
  - CS fallback to 2G with measurements

- **For Scenario F:**
  - CS fallback to 3G with measurements

The UE is successfully registered for CS and PS Domain in E-UTRAN cell.

---

Table:

<table>
<thead>
<tr>
<th>Downlink</th>
<th>Bandwidth</th>
<th>Advertised Throughput FDD (ref. 3GPP 36.306)</th>
<th>Minimum Throughput</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 1</td>
<td>10 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 5</td>
<td>20 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 4</td>
<td>20 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 3</td>
<td>20 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 2</td>
<td>20 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
<tr>
<td>Cat 1</td>
<td>20 MHz</td>
<td>[TBD]</td>
<td>[TBD]</td>
</tr>
</tbody>
</table>
If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".

The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

**Test procedure**

For each of the six scenarios mentioned above:

1. Make a voice call to a phone. (PSTN or mobile phone)
2. Verify that the call establishment procedure is performed.

**Expected behaviour**

A voice connection in both directions on UTRAN or GERAN cell is established, and an active voice call indicator is displayed.

### 34.1.2 Mobile Originated voice call with CS fallback, NW reject

**Description**

The UE shall behave correctly when a Mobile Originated voice call with CS fallback to 2G or 3G is rejected by the NW.

**Related core specifications**

3GPP TS 23.272 (v9.2.0)
3GPP TS 24.301 (v8.2.1)

**Reason for test**

To verify that the UE behave correctly when a Mobile Originated voice call with CS fallback is rejected by the NW.

**Initial configuration**

E-UTRAN, and UTRAN or GERAN cells are available.

The NW shall support one or more of the following CS fallback types for voice calls:

- **For Scenario A:** Blind CS fallback to 2G
- **For Scenario B:** Blind CS fallback to 3G
- **For Scenario C:** CS fallback to 2G with System Info (RIM)
- **For Scenario D:** CS fallback to 3G with System Info (RIM)
- **For Scenario E:** CS fallback to 2G with measurements
- **For Scenario F:** CS fallback to 3G with measurements

The UE is successfully registered for CS and PS Domain in E-UTRAN cell.

If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".

The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

**Test procedure**

For each of the six scenarios mentioned above:
1. Make a voice call to a phone (PSTN or mobile phone) and verify the UE sends an EXTENDED SERVICE REQUEST message with Service type set to "mobile originating CS fallback or 1xCS fallback".

2. The NW sends a SERVICE REJECT message with EMM cause set to "CS domain temporarily not available".

Expected behaviour
A voice connection in both directions is not established, and an active voice call indicator is not displayed.

34.1.3 Mobile Terminated voice call with CS fallback, UE in Idle, Call accepted

Description
The UE in Idle state shall successfully perform a Mobile Terminated voice call with CS fallback to 2G or 3G.

Related core specifications
3GPP TS 23.272 (v9.2.0)
3GPP TS 24.301 (v8.2.1)

Reason for test
To verify that the UE in Idle state successfully performs a Mobile Terminated voice call with CS fallback.

Initial configuration
E-UTRAN, and UTRAN or GERAN cells are available.
The NW shall support one or more of the following CS fallback types for voice calls:

For Scenario A:
  Blind CS fallback to 2G

For Scenario B:
  Blind CS fallback to 3G

For Scenario C:
  CS fallback to 2G with System Info (RIM)

For Scenario D:
  CS fallback to 3G with System Info (RIM)

For Scenario E:
  CS fallback to 2G with measurements

For Scenario F:
  CS fallback to 3G with measurements

The UE is in Idle state and successfully registered for CS and PS Domain in E-UTRAN cell.

If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

Test procedure
For each of the six scenarios mentioned above:
  1. Receive a voice call from a phone. (PSTN or mobile phone)
  2. Accept the call by the user.
Expected behaviour
A voice connection in both directions on UTRAN or GERAN cell is established, and an active voice call indicator is displayed.

34.1.4 Mobile Terminated voice call with CS fallback, UE in Data session, Call accepted by the user

Description
The UE in Data session shall successfully perform a Mobile Terminated voice call with CS fallback to 2G or 3G.

Related core specifications
3GPP TS 23.272 (v9.2.0)
3GPP TS 24.301 (v8.2.1)

Reason for test
To verify that the UE in Data session successfully performs a Mobile Terminated voice call with CS fallback when the Call is accepted by the user.

Initial configuration
E-UTRAN, and UTRAN or GERAN cells are available.
The NW shall support one or more of the following CS fallback types for voice calls:

For Scenario A:
   Blind CS fallback to 2G

For Scenario B:
   Blind CS fallback to 3G

For Scenario C:
   CS fallback to 2G with System Info (RIM)

For Scenario D:
   CS fallback to 3G with System Info (RIM)

For Scenario E:
   CS fallback to 2G with measurements

For Scenario F:
   CS fallback to 3G with measurements

The UE is in Idle state and successfully registered for CS and PS Domain in E-UTRAN cell.
If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

Test procedure
For each of the six scenarios mentioned above:
   1. Start transferring Data, e.g. by using FTP.
   2. Receive a voice call from a phone. (PSTN or mobile phone)
   3. Accept the call by the user.

Expected behaviour
   1. Data transfer starts successfully.
   2. An incoming voice call indicator is displayed, and data transfer is not interrupted.
3. A voice connection in both directions on UTRAN or GERAN cell is established.
   If the UE is on the UTRAN cell where PS service is available, it continues transferring Data.
   If the UE is on the GERAN cell, both the UE and the target RAT must support DTM for PS service to continue, otherwise the UE does not continue transferring Data.

34.1.5 Mobile Terminated voice call with CS fallback, UE in Data session, Call rejected by the user

Description
The UE in Data session shall behave correctly when a Mobile Terminated voice call with CS fallback to 2G or 3G is rejected by the user.

Related core specifications
3GPP TS 23.272 (v9.2.0)
3GPP TS 24.301 (v8.2.1)

Reason for test
To verify that the UE in a data session behaves correctly when a Mobile Terminated voice call with CS fallback is rejected by the user.

Initial configuration
E-UTRAN, and UTRAN or GERAN cells are available.
The NW shall support one or more of the following CS fallback types for voice calls:

For Scenario A:
   Blind CS fallback to 2G
For Scenario B:
   Blind CS fallback to 3G
For Scenario C:
   CS fallback to 2G with System Info (RIM)
For Scenario D:
   CS fallback to 3G with System Info (RIM)
For Scenario E:
   CS fallback to 2G with measurements
For Scenario F:
   CS fallback to 3G with measurements

The UE is in Idle state and successfully registered for CS and PS Domain in E-UTRAN cell.
If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

Test procedure
For each of the six scenarios mentioned above:
1. Start transferring Data, e.g. by using FTP.
2. Receive a voice call from a phone. (PSTN or mobile phone)
3. The user rejects the call.

Expected behaviour
1. Data transfer starts successfully.
2. The incoming call triggers a CS fallback procedure. The voice channel is properly established on the GERAN or UTRAN cell and the UE alerts the user of the call.

   If the UE is on a UTRAN cell where PS service is available, the data transfer continues while the user is alerted.

   If the UE is on a GERAN cell and the network and the UE support DTM, the data transfer continues while the user is alerted. Otherwise the data transfer is interrupted.

3. The voice call is aborted, the CS resources are cleared and the UE returns to the idle state. The data transfer then continues and the UE returns to the E-UTRA cell either during or after the data transfer has ended depending on the capabilities of the UE and the network to trigger a change to E-UTRA during an on-going data transfer.

34.1.6 Emergency call with CS fallback

34.1.6.1 Emergency call with CS fallback, Successful

Description
The UE shall successfully perform an emergency call with CS fallback.

Related core specifications
3GPP TS 23.272 (v9.2.0)

Reason for test
To verify that the UE successfully performs an emergency call with CS fallback.

Initial configuration
E-UTRAN, and UTRAN or GERAN cells are available.

The UE and NW support CS fallback for voice calls.

The UE is successfully registered for CS and PS Domain in E-UTRAN cell.

If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".

The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

Test procedure

1. Make an emergency call.

2. Verify that the call establishment procedure is performed.

Expected behaviour

1. –

2. A voice connection in both directions on UTRAN or GERAN cell is established, and an active voice call indicator is displayed.

34.1.6.2 Emergency call CSFB failure - UE LTE-camped, supports CSFB, CSFB layer not present at UE location

[Tests to be defined]

34.1.7 Supplementary Services with CS fallback, Successful

Description
The UE shall successfully perform a Supplementary Service operation with CS fallback.

Related core specifications
3GPP TS 23.272 (v9.2.0)
Reason for test
To verify that the UE successfully performs an call independent supplementary services with CS fallback.

Initial configuration
E-UTRAN, and UTRAN or GERAN cells are available.
The UE and NW support CS fallback for voice calls.
The UE is successfully registered for CS and PS Domain in E-UTRAN cell.
If the UE and network supports IMS voice over PS sessions, the UE is set to "CS Voice preferred, IMS PS Voice secondary". Otherwise, the UE is set to "CS Voice only".
The UE operates in CS/PS mode 1 of operation or CS/PS mode 2 of operation.

Test procedure
1. Originate a Call Independent Supplementary Service operation (e.g. Call Forwarding interrogation).
2. Observe that procedure is successful.

Expected behaviour
1. –
2. A signalling connection is established on UTRAN or GERAN cell, and the supplementary service operation is successful.

35 SMS over E-UTRA

35.1 SMS over SGs

35.1.1 Idle Mobile Terminated SMS over SGs when on E-UTRA

Description
Ensure that an SMS over SGs message can be received while the UE is camped on an E-UTRA network.

Related 3GPP core specifications
3GPP TS 23.272

Reason for test
To ensure that the UE correctly accepts an SMS over SGs message when in idle mode.

Initial configuration
Idle mode with UE camped on an E-UTRA network which supports SMS over SGs. Ensure network and device are not configured to receive SMS over IMS.

Test procedure
Arrange for an SMS message to be sent to the UE. Check that the message is received and the contents are correctly displayed.

Expected behaviour
The message is received and the contents are correctly displayed.

35.1.2 Idle Mobile Originated SMS over SGs when on E-UTRA

Description
Ensure that an SMS over SGs message can be sent while the UE is camped on E-UTRA network.
Related 3GPP core specifications
3GPP TS 23.272

Reason for test
To ensure that the UE correctly sends an SMS over SGs message when on an E-UTRA network.

Initial configuration
Idle mode with UE camped on an E-UTRA network which supports SMS over SGs. Ensure network and device are not configured to send/receive SMS over IMS

Test procedure
Send an SMS message from the UE to another UE. Check that the message is received on the second UE.

Expected behaviour
The message is received by the second UE and the contents are correctly displayed.

36 Data Retry

36.1 RRC Errors

36.1.1 RRCConectionReject Message: initial attach

Description
This test verifies that the UE meets the requirements for data retry when the network responds to an RRCConectionRequest message with an RRCConectionReject message. This test verifies UE behaviour when the RRCConectionReject message is received during the UE’s initial attempt to attach to the E-UTRA network.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the RRCConectionReject message is received during the UE’s initial attempt to attach to the E-UTRA network.

Initial configuration
Configure the test equipment to respond to all RRCConectionRequest messages with an RRCConectionReject message.

Configure the test equipment such that the value for WaitTime in the RRCConectionReject message is T seconds.

Test procedure
1. Verify that the device under test (DUT) has an application that will attempt to connect to the service PDN as soon as the DUT is powered on and finds service on the E-UTRA network.
2. Power the DUT on and allow it to find E-UTRA service.
3. Verify that the DUT attempts to attach to the E-UTRA network and that the network responds to the RRCConectionRequest message with an RRCConectionReject message with a WaitTime value of T seconds.
4. Continue the test for 10 minutes and verify that the DUT always waits at least T seconds between subsequent attempts to connect to the network.

Expected behaviour
The UE waits at least WaitTime seconds between transmissions of RRC connection attempts.
36.1.2 Idle Mobile Originated SMS over SGs when on E-UTRA

Description
This test verifies that the UE meets the requirements for data retry when the network responds to an RRCConnectionRequest message with an RRCConnectionReject message. This test verifies UE behaviour when the RRCConnectionReject message is received while the UE is attempting to send data to a PDN that has previously been connected.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the RRCConnectionReject message is received while the UE is attempting to send data to a PDN that has previously been connected.

Initial configuration
Configure the test equipment so that all attachments and connections are allowed. The UE is successful in connecting to the internet PDN on behalf of the test application. Configure the application to the application idle state.

Re-configure the test equipment to respond to all RRCConnectionRequest messages with an RRCConnectionReject message. Configure the test equipment such that the value for WaitTime in the RRCConnectionReject message is T seconds.

Test procedure
1. Force the DUT to the RRC IDLE state by having the network transmit an RRCConnectionRelease message.
2. Initiate an activity on the DUT so that the application has data to send to the network.
3. Verify that the DUT attempts to connect to the E-UTRA network and the network responds to the RRCConnectionRequest message with an RRCConnectionReject message with a WaitTime value of T seconds.
4. Continue the test for 10 minutes and verify that the DUT always waits at least T seconds between subsequent attempts to connect to the network.
5. Switch the test application to the application transmitting state and set the retransmission timer to T seconds
6. Verify that the DUT attempts to connect to the E-UTRA network and the network responds to the RRCConnectionRequest message with an RRCConnectionReject message with a WaitTime value of T seconds.
7. Continue the test for 10 minutes and verify that the DUT always waits at least T seconds between subsequent attempts to connect to the network.

Expected behaviour
The UE waits at least WaitTime seconds between transmissions of RRC connection attempts.

36.2 EMM (EPS Mobility Management) Common Procedures

36.2.1 UE Fails to Authenticate the Network: Invalid MAC Code

Description
This test verifies that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid MAC code in the NAS Authentication Request message.
Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid MAC code in the NAS Authentication Request message.

Initial configuration
Configure the test setup so that the DUT finds service on a single eNodeB with cell id equal to value X1 and PLMN id equal to value Y1.

Configure the test equipment such that the MAC code in the AUTN information element of the NAS Authentication Request message is set to an invalid value.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection and sends a NAS Attach Request message.
3. Verify that, during the authentication portion of the attachment process, the network sends a NAS Authentication Request message in which the MAC code in the AUTN information element is set to an invalid value.
4. Verify that the UE sends a NAS Authentication Failure message to the network in which the EMM cause code is #20 (MAC failure).
5. Ensure that the network does not transmit any further NAS messages for at least T seconds which will cause timer T3413 to expire.
6. Monitor the DUT for more than 5 minutes and verify that it does not attempt to attach to the E-UTRA network for at least T seconds after the initial failure.
7. Attempt to initiate a connection to the Internet PDN from the DUT.
8. Verify that the DUT attempts to connect to that eNodeB.
9. Reconfigure the test setup so that the DUT now finds service on a different eNodeB with cell id equal to value X2 where X2 is not equal to X1. X1 and X2 are on the same frequency. The PLMN id is still equal to Y1.
10. Verify that the DUT attempts to attach to the E-UTRA network on the new eNodeB.
11. Reconfigure the eNodeB such that the cell id equal to X1 and change the PLMN id to value Y2 where Y2 is not equal to Y1. The frequency of the second PLMN shall be the same as the first.
12. Verify that the DUT attempts to attach to the E-UTRA network on the new eNodeB.

Expected behaviour
UE does not attempt any further connections with an E-UTRA eNodeB for T seconds if it is unable to authenticate the network. UE will attempt connections on a different eNodeB.

36.2.2 UE Fails to Authenticate the Network: Invalid Value for Separation Bit
Description
This test verifies that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid value for the separation bit in the AMF(Authentication Management Field) field of the AUTN information element in the NAS Authentication Request message. It verifies that a power cycle of the device will clear throttling behaviour.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331
Reason for test
To ensure that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid value for the separation bit in the AMF field of the AUTN information element in the NAS Authentication Request message. A power cycle of the device will clear throttling behaviour.

Initial configuration
Configure the test setup so that the DUT finds service on a single eNodeB with cell id equal to value X1 and PLMN id equal to value Y1.

Configure the test equipment such that the separation bit in the AMF field of the AUTN information element in the NAS Authentication Request message is set to a value of ‘0’.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection and sends a NAS Attach Request message.
3. Verify that, during the authentication portion of the attachment process, the network sends a NAS Authentication Request message in which the AMF field in the AUTN information element is set to a value of ‘0’.
4. Verify that the UE sends a NAS Authentication Failure message to the network with EMM Cause Code #26 “Non-EPS authentication not acceptable”.
5. Ensure that the network does not transmit any further UE-directed NAS messages for at least T seconds which will cause timer T3420 to expire.
6. Monitor the DUT for more than 5 minutes and verify that it does not attempt to attach to the E-UTRA network for at least T seconds after the initial failure.
7. Attempt to initiate a connection to the Internet PDN from the DUT.
8. Verify that the DUT attempts to connect to the E-UTRA network.
9. Cycle the power on the DUT (turn the device off and then back on again). Verify that the UE finds service on the same eNodeB, that the UE attempts to attach, and that during the authentication portion of the attachment process, the network sends a NAS Authentication Request message in which the AMF field in the AUTN information element is set to a value of ‘0’.
10. Verify that the UE sends a NAS Authentication Failure message to the network with EMM Cause Code #26 “Non-EPS authentication not acceptable”.
11. Ensure that the network does not transmit any further UE-directed messages for at least T seconds which will cause timer T3420 to expire.
12. Monitor the DUT for 5 minutes and verify that it does not attempt to attach to the E-UTRA network.
13. Attempt to initiate a connection to the Internet PDN from the DUT.
14. Verify that the DUT does attempts to connect to the E-UTRA network.
15. Reconfigure the test setup so that the DUT now finds service on a different eNodeB with cell id equal to value X2 where X2 is not equal to X1. X1 and X2 are on the same frequency. The PLMN id is still equal to Y1.
16. Verify that the DUT attempts to attach to the E-UTRA network on the new eNodeB.

Expected behaviour
UE does not attempt any further connections with an E-UTRA eNodeB for at least T seconds if it is unable to authenticate the network until power cycle. UE will attempt connections on a different eNodeB.
36.2.3 UE Fails to Authenticate the Network: Invalid Value for SQN Field

Description
This test verifies that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid value for the SQN(sequence number) field of the AUTN information element in the NAS Authentication Request message.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the UE is unable to authenticate the network because of an invalid value for the SQN(sequence number) field of the AUTN information element in the NAS Authentication Request message.

Initial configuration
Configure the test setup so that the DUT finds service on a single eNodeB with cell id equal to value X1 and PLMN id equal to value Y1.
Configure the test equipment such that the SQN field of the AUTN information element in the NAS Authentication Request message is set to an invalid value.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection and sends a NAS Attach Request message.
3. Verify that, during the authentication portion of the attachment process, the network sends a NAS Authentication Request message in which the SQN code in the AUTN information element is set to an invalid value.
4. Verify that the UE sends a NAS Authentication Failure message to the network with an EMM cause code of #21 “Sync failure”.
5. Ensure that the network does not transmit any further UE-directed NAS messages for at least T seconds which will cause timer T3420 to expire.
6. Monitor the DUT for at least 5 minutes and verify that it does not attempt to attach to the E-UTRA network for at least T seconds after the initial failure.
7. Attempt to initiate a connection to the Internet PDN from the DUT.
8. Verify that the DUT attempts to connect to the E-UTRA network.
9. Reconfigure the test setup so that attach attempts will succeed and the UE will now successfully authenticate the network.
10. Reconfigure the test setup so that the DUT now finds service on a different eNodeB with cell id equal to value X2 where X2 is not equal to X1. X1 and X2 are on the same frequency. The PLMN id is still equal to Y1.
11. Verify that the DUT attempts to attach to the E-UTRA network on the new eNodeB.
12. Reconfigure the test setup so that the DUT finds service on the original eNodeB (cell id = X1, PLMN id = Y1).
13. Attempt to initiate a connection to the Internet PDN from the DUT.
14. Verify that the DUT does not attempt to connect to the E-UTRA network until at least 5 minutes after the previous failure.

Expected behaviour
UE does not attempt any further connections with an E-UTRA eNodeB for at least T seconds if it is unable to authenticate the network. UE will attempt connections on a different eNodeB.
36.2.4 Network Fails to Authenticate the UE: Network Sends “Authentication Reject” Message

Description
This test verifies that the UE meets the requirements for data retry when the network sends a NAS “Authentication Reject” message to the UE.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the network sends a NAS “Authentication Reject” message to the UE.

Initial configuration
Configure the test setup so that the DUT finds service on a single eNodeB with PLMN id equal to value Y1.

Configure the test equipment such that the network responds to a NAS Authentication Response message from the UE with a NAS Authentication Reject message.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection and sends a NAS Attach Request message.
3. Verify that the network sends a NAS Authentication Request message during the authentication portion of the attach process and that the UE responds by sending a NAS Authentication Response message.
4. Verify that the network sends a NAS Authentication Reject message to the UE.
5. Monitor the DUT for 5 minutes and verify that it does not attempt to attach to the E-UTRA network.
6. Attempt to initiate a connection to the Internet PDN from the DUT.
7. Verify that the DUT does not attempt to connect to the E-UTRA network.
8. Reconfigure the test setup so that the DUT now finds service on a different eNodeB on which the PLMN id is equal to Y2. The frequency of the second PLMN may or may not be the same as the first.
9. Verify that the DUT does not attempt to attach to the E-UTRA network on the new eNodeB.
10. Monitor the DUT for 5 minutes and verify that it does not attempt to attach to the E-UTRA network.
11. Attempt to initiate a connection to the Internet PDN from the DUT.
12. Verify that the DUT does not attempt to connect to the E-UTRA network.
13. Power cycle the DUT.
14. Verify that the DUT again attempts to attach to the E-UTRA network.

Expected behaviour
UE does not attempt any further connections with any E-UTRA network if it receives a NAS Authentication Reject message from the network.
36.2.5 UE Sends “Security Mode Reject” Message: Initial Attach

Description
This test verifies that the UE meets the requirements for data retry when the UE sends a NAS Security Mode Reject message to the network in response to a NAS Security Mode Command message. This test applies to the situation in which the UE is attempting an initial attach.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the network sends a NAS “Authentication Reject” message to the UE.

Initial configuration
Configure the test setup so that the DUT finds service on a single eNodeB with PLMN id equal to value Y1.

Configure the test equipment such that the network proposes capabilities that the UE does not support when sending a NAS Security Mode Command message.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection and sends a NAS Attach Request message.
3. Verify that the network sends a NAS Authentication Request message and that the UE responds by sending a NAS Authentication Response message.
4. Verify that the network then sends a NAS Security Mode Command message and that the UE sends a NAS Security Mode Reject message.
5. Verify that the attachment attempt is aborted by the network per 3GPP TS24.301.
6. Configure the test application for the application transmitting state with a retransmission timer set to T seconds.
7. Verify that the UE attempts to attach on behalf of the test application after a time defined by timer T3411. Verify that the UE again sends a NAS Security Mode Reject message during the Authentication/Security stage of the attach process and the network aborts the attachment attempt. This is considered Retry #1.
8. Verify that the UE again attempts to attach on behalf of the test application after waiting at least T3411 seconds. Verify that the UE again sends a NAS Security Mode Reject message during the Authentication/Security stage of the attach process and the network aborts the attachment attempt. This is considered Retry #2.
9. Verify that the UE again attempts to attach on behalf of the test application after waiting at least T3411 seconds. Verify that the UE again sends a NAS Security Mode Reject message during the Authentication/Security stage of the attach process and then abandons the attachment attempt. This is considered Retry #3.
10. Verify that the UE again attempts to attach on behalf of the test application after waiting at least T3411 seconds. Verify that the UE again sends a NAS Security Mode Reject message during the Authentication/Security stage of the attach process and then abandons the attachment attempt. This is considered Retry #4. The attach counter should now have reached a value of 5.
11. After the fourth retry attempt fails, verify that the next attempt does not occur for T3402 minutes.
12. Verify that the UE sends a second cluster of 5 more attach requests with each individual attempt separated by at least T3411 seconds. After that, verify that the UE sends no additional attach attempts for at least T3402 minutes.
Expected behaviour

UE follows the data retry algorithm described in the above “test procedure” when it sends a NAS Security mode Reject message during the initial attach process.

36.3 EPS Session Management

36.3.1 Network Fails to Assign an IPv6 Address for the Internet PDN

Description

This test verifies that the UE meets the requirements for data retry when the network fails to assign an IPv6 address to the UE.

Related 3GPP core specifications

3GPP TS 24.301
3GPP TS 36.331
IETF RFC 4861

Reason for test

To ensure that the UE meets the requirements for data retry when the network fails to assign an IPv6 address to the UE.

Initial configuration

Configure the test setup so that DUT finds service on a single eNodeB with cell_id equal to value X1, PLMN id equal to value Y1, and TAI(tracking area identifier) equal to value Z1.

Configure the test equipment such that the network will allow the UE to attach and connect to the internet PDN but the internet PDN will not respond to the UE’s request for an IPv6 Router Solicitation message.

Test procedure

1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection, attaches to the network.
3. Initiate the test application (see section 1.5) and configure it for the application transmitting state with a retransmission timer set to T seconds
4. Verify that the device connects to the Internet PDN.
5. Verify that the UE sends IPv6 Router Solicitation messages to the network and that the network does not respond.
6. Verify that the UE does not send more than MAX_RTR_SOLICITATION (3 per RFC 4861) Router Solicitation messages separated by RTR_SOLICITATION_INTERVAL (4) seconds.
7. Verify that the UE detaches from the E-UTRA network and starts timer T3402.
8. Monitor the UE for 15 minutes and verify that the UE does not initiate attachment attempts before T3402 expires.

Expected behaviour

UE follows the required retry algorithm when the PDN does not assign an IPv6 address.

36.3.2 Network Fails to Refresh the IPv6 Address for the Internet PDN

Description

This test verifies that the UE meets the requirements for data retry when the network fails to refresh an IPv6 address to the UE.

Related 3GPP core specifications

3GPP TS 24.301
Reason for test
To ensure that the UE meets the requirements for data retry when the network fails to refresh an IPv6 address to the UE.

Initial configuration
Configure the test setup so that DUT finds service on a single eNodeB with cell_id equal to value X1, PLMN id equal to value Y1, and TAI(tracking area identifier) equal to value Z1.

Configure the test equipment such that the network will allow the UE to attach and connect to the internet PDN and the internet PDN will respond to the UE’s initial request for an IPv6 Router Solicitation message but will not respond to all subsequent requests.

Test procedure
Power the DUT on and allow it to find E-UTRA service.
Verify that the DUT successfully establishes an RRC connection, attaches to the network.
Verify that the UE sends IPv6 Router Solicitation messages to the network and that the network responds. Configure the network so that the Router Advertisement message uses a “Valid Lifetime” of 5 minutes, a “Preferred Lifetime” of 5 minutes, and a “Router Lifetime” of 4 minutes.
Initiate the application that connects to the Internet PDN and verify that it connects successfully.
Verify that the device sends a Router Solicitation message to the internet PDN after 3 minutes have elapsed from the receipt of the first Router Advertisement message.
Verify that the network does not respond to the Router Solicitation messages. Verify that the UE does not send more than MAX_RTR_SOLICITATION (3 per RFC 4861) Router Solicitation messages separated by RTR_SOLICITATION_INTERVAL (4) seconds.
Verify that the UE detaches from the E-UTRA network and starts timer T3402 4 minutes after the receipt of the Agent Advertisement message.
Monitor the UE for 15 minutes and verify that the UE does not initiate attachment attempts before T3402 expires.

Expected behaviour
UE follows the required retry algorithm when the PDN does not refresh the IPv6 address of the internet PDN.

36.3.3 UE Receives PDN Connectivity Reject Message from the Network for the Internet PDN

Description
This test verifies that the UE meets the requirements for data retry when the UE receives a NAS PDN Connectivity Reject message while attempting to connect to the internet PDN on the E-UTRA network.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the network fails to refresh an IPv6 address to the UE.

Initial configuration
Configure the test setup so that DUT finds service on a single eNodeB with cell_id equal to value X1, PLMN id equal to value Y1, and TAI(tracking area identifier) equal to value Z1.
Configure the network will send a NAS PDN Connectivity Reject message with cause code 8 when the UE attempts to connect to the internet PDN.

**Test procedure**

1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection, attaches to the network.
3. Initiate the test application. Configure the test application for the application transmitting state with the retransmission timer set to T seconds.
4. Verify that the network responds to the internet PDN Connectivity Request message from the UE by sending a PDN Connectivity Reject message with an ESM (EPS Session Management) cause code of 8.
5. Verify that the UE sends a NAS PDN Connectivity Request without delay at the request of the test application and that the network again responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #1.
6. Verify that the UE sends another NAS PDN Connectivity Request without delay at the request of the test application and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #2.
7. Verify that the test application requests a connection every T seconds and that the UE does not request the connection over the air for the next 1 minute plus a random time between 0 and T seconds.
8. Once the 1 minute timer expires, verify that the UE attempts to connect upon the next request of the test application with no delay. Verify that the UE sends another NAS PDN Connectivity Request and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #3.
9. Verify that the test application requests a connection every T seconds and that the UE does not request the connection over the air for the next 2 minutes.
10. Once the 2 minute timer expires, verify that the UE attempts to connect upon the next request of the test application with no delay. Verify that the UE sends another NAS PDN Connectivity Request and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #4.
11. Verify that the test application requests a connection every T seconds and that the UE does not request the connection over the air for the next 8 minutes.
12. Once the 8 minute timer expires, verify that the UE attempts to connect upon the next request of the test application with no delay. Verify that the UE sends another NAS PDN Connectivity Request and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #5.
13. Verify that the test application requests a connection every T seconds and that the UE does not request the connection over the air for the next 15 minutes.
14. Once the 15 minute timer expires, verify that the UE attempts to connect upon the next request of the test application with no delay. Verify that the UE sends another NAS PDN Connectivity Request and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This is considered Retry #6.
15. Verify that the test application requests a connection every T seconds and that the UE does not request the connection over the air for the next 15 minutes.
16. Once the 15 minute timer expires, verify that the UE attempts to connect upon the next request of the test application with no delay. Verify that the UE sends another NAS PDN Connectivity Request and that the network responds with a NAS PDN Connectivity Reject message in which the ESM Cause Code is set to 8. This considered Retry #7.
17. Repeat the test for ESM cause codes 26, 27, 29, 30, 31, 32, 33, 34, and 38.

**Expected behaviour**

UE follows the data retry algorithm described in the above “test procedure” when it receives a NAS PDN Connectivity Reject message.
36.3.4 UE Receives Bearer Resource Allocation Reject Message from the Network: Codes 30-34

Description
This test verifies that the UE meets the requirements for data retry when the UE receives a NAS Bearer Resource Allocation Reject message while attempting to connect a dedicated bearer with a PDN on the E-UTRA network.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331

Reason for test
To ensure that the UE meets the requirements for data retry when the UE receives a NAS Bearer Resource Allocation Reject message while attempting to connect a dedicated bearer with a PDN on the E-UTRA network.

Initial configuration
Configure the test setup so that DUT finds service on a single eNodeB with cell_id equal to value X1, PLMN id equal to value Y1, and TAI (tracking area identifier) equal to value Z1.

Configure the test equipment such that the network will allow the UE to attach and connect to the internet PDN but the network will send a NAS Bearer Resource Allocation Reject message with cause code 30 when the UE attempts to connect dedicated bearer resources to the internet PDN.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection, attaches to the network.
3. Initiate the application that will attempt to connect both default and dedicated bearers.
4. Verify that the default bearer connects successfully but the network sends a NAS Bearer Resource Allocation Reject message in response to the NAS Bearer Resource Allocation Request message. Verify that the ESM cause code is set a value of 30.
5. Monitor the UE for 30 minutes and verify that the UE does not initiate connection attempts of the dedicated bearer resources at intervals more often than T seconds, T seconds, 1 minute, 2 minutes, 8 minutes, and 15 minutes.
6. Repeat the test for ESM cause codes 31, 32, 33, and 34.

Expected behaviour
UE follows the data retry algorithm described in the above “test procedure”.

36.4 Network Initiated ESM Procedures

36.4.1 UE Receives Deactivate EPS Bearer Context Request Message from the Network: 1 PDN Connection Open

Description
This test verifies that the UE meets the requirements for data retry when the UE receives a NAS Deactivate EPS Bearer Context Request message while connected to the internet PDN on the E-UTRA network.

Related 3GPP core specifications
3GPP TS 24.301
3GPP TS 36.331
Reason for test
To ensure that the UE meets the requirements for data retry when the UE receives a NAS Deactivate EPS Bearer Context Request message while connected to the internet PDN on the E-UTRA network.

Initial configuration
Configure the test setup so that DUT finds service on a single eNodeB with cell_id equal to value X1, PLMN id equal to value Y1, and TAI(tracking area identifier) equal to value Z1.

Configure the test equipment to allow the device to attach and connect to all PDNs.

Test procedure
1. Power the DUT on and allow it to find E-UTRA service.
2. Verify that the DUT successfully establishes an RRC connection, attaches to the network.
3. Configure the test equipment to send a NAS “Deactivate EPS Bearer Context Request” message to disconnect the internet PDN.
4. Verify that the UE disconnects from the internet PDN.
5. Verify that the UE immediately initiates a successful DETACH procedure.
6. Verify that the UE immediately re-attaches to the E-UTRA network and re-connects to the internet PDN.

Expected behaviour
UE follows the algorithm described in the above “test procedure” when it receives a NAS PDN Deactivate EPS Bearer Context Request message for the internet PDN.
Annex D: Detailed Test Procedures for RAT independent services

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of RAT independent services.

NOTE: For a Dual or Multi RAT Terminal Device, all RAT independent Test Scenarios should be executed as specified below:

- Devices supporting GERAN/UTRA technology shall be tested in UTRA network and subset of test scenarios shall be executed in GERAN network as a regression test.
- Devices supporting GERAN/UTRA/E-UTRA technology shall be tested in E-UTRA network and a subset of Test Scenarios shall be executed in a GERAN & UTRA network as a regression test.

40 Basic Voice Calls CS

40.1 Mobile originated calls

40.1.1 Mobile originated call complete

Description
The DUT shall make an outgoing voice call.

Related GSM core specifications
TS 24.008 clause 5

Reason for test
The DUT is of limited use if it cannot complete an outgoing call.

Initial configuration
DUT in idle mode.

Call Waiting disabled at DUT, Client 1 and Client 2.

Call Forwarding disabled at DUT, Client 1 and Client 2.

Test scenarios (overview)

Scenario A: ISDN is used as Client 1 and Client 2.

Scenario B: PSTN is used as Client 1 and Client 2.

Scenario C: PBX is used as Client 1 and Client 2.

Scenario D: Mobile is used as Client 1 and Client 2.

The below test procedure is applicable to all scenarios.

Test procedure

Normal Call
1. At DUT, make MO voice call to Client 1.
2. Answer call on Client 1.
3. At DUT, end voice call to Client 1.

Call Forwarding notification check
4. At Client 1, activate Call Forwarding to Client 2.
5. At DUT, make MO voice call to Client 1.
6. Check for SS notification on DUT.
7. Answer call on Client 2.
8. At DUT, end voice call to Client 2.

Call Waiting notification check
9. At Client 1, activate Call Waiting.
10. At Client 1, make MO voice call to Client 2.
11. At DUT, make MO voice call to Client 1.
12. Check for SS notification on DUT.
14. At DUT, end voice call to Client 1.

Expected behaviour

Normal Call
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio connection is established.
3. Voice call is ended between DUT and Client 1.

Call Forwarding notification check
4. Call Forwarding is successfully setup from Client 1 to Client 2.
5. DUT is alerting. Client 2 displays CLIP information of DUT.
6. DUT displays SS notification "Call is Forwarded" or similar. (SS notification support is network dependent)
7. 2-Way audio connection is established.
8. Voice call is ended between DUT and Client 2.

Call Waiting notification check
9. Call Waiting is successfully setup at Client 1.
10. Client 1 is in voice call with Client 2.
11. DUT is alerting. Client 1 displays CLIP information of new incoming call from DUT.
12. DUT displays SS notification "Call is Waiting" or similar. (SS notification support is network dependent)
13. 2-Way audio connection is established.
14. Voice call is ended between DUT and Client 1.

40.1.2 Mobile originated call to occupied phone

Description
The DUT shall make an outgoing voice call to a busy Client and correctly indicate the busy status.

Related GSM core specifications
TS 24.008 clause 5

Reason for test
DUT is of limited use if it cannot correctly indicate the busy status of an outgoing call.

Initial configuration
DUT in idle mode.
Call Waiting disabled at Client 1 and Client 2.
Test procedure

Call Rejected
1. At DUT make MO voice call to Client 1.
2. At Client 1 reject the incoming call directly.

User busy
3. At Client 1, make MO voice call to Client 2.
4. At DUT, make MO voice call to Client 1.

Expected behaviour

Call rejected
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. Call is not connected and DUT displays “User Busy” or similar and emits busy tones from the speaker.

User Busy
3. Client 1 is in voice call with Client 2.
4. Call is not connected and DUT displays “User Busy” or similar and emits busy tones from the speaker.

40.1.3 Mobile originated call to international B-subscriber (with "+")

Description
The DUT shall correctly make an international call using a number provided in the international format (using the + prefix)

Related GSM core specifications
TS 24.008 clause 5

Reason for test
Use of the + prefix is essential for making international calls, and for correct use of stored numbers while roaming.

Initial configuration
DUT in idle mode.
CLIR disabled at DUT.
CLIP enabled at Client 1 and Client 2. Client 1 has same international prefix as DUT.
Client 2 has different international prefix as DUT.

Test procedure

Scenario A: Same Country, Not Stored
1. Delete all entries in DUT phonebook.
2. At DUT, make MO voice call to Client 1 using the + international prefix and full international number.
3. At DUT, end voice call to Client 1.

Scenario B: Same Country, Stored
1. Store Client 1 ADN in DUT phonebook.
2. At DUT, make MO voice call to Client 1 using the + international prefix and full international number.
3. At DUT, end voice call to Client 1.

Scenario C: Different Country, Not Stored
1. Delete all entries in DUT phonebook.
2. At DUT, make MO voice call to Client 2 using the + international prefix and full international number.
3. At DUT, end voice call to Client 2.

**Scenario D: Different Country, Stored**

1. Store Client 2 ADN in DUT phonebook.
2. At DUT, make MO voice call to Client 2 using the + international prefix and full international number.
3. At DUT, end voice call to Client 2.

**Expected behaviour**

1. DUT phonebook is updated.
2. Client displays CLIP information of DUT during alerting phase.
   - DUT is alerting.
   - The call is answered at Client.
   - 2-way audio is established between DUT and Client.
3. Voice call is ended between DUT and Client.

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### 40.2 Mobile terminated calls

**Description**
The DUT shall present the correct CLIP information on an incoming call.

**Related GSM core specifications**
TS 24.081 sub clause 1.1

**Reason for test**
To ensure that calling line identification is presented on the DUT.

**Initial configuration**
DUT in idle mode.
Call Waiting disabled at DUT, Client 1 and Client 2.
Call Forwarding disabled at DUT, Client 1 and Client 2.

**Test scenarios (overview)**

**Scenario A:** ISDN is used as Client 1 and Client 2.
**Scenario B:** PSTN is used as Client 1 and Client 2.
**Scenario C:** PBX is used as Client 1 and Client 2.
**Scenario D:** Mobile is used as Client 1 and Client 2.

The below test procedure is applicable to all scenarios.

**Test procedure**

**Normal Call**
1. At DUT, receive MT voice call from Client 1.
2. Answer call on DUT.
3. At Client 1, end voice call to DUT.

**Call Forwarding notification check**
4. At Client 1, activate Call Forwarding to DUT.
5. At Client 2, make MO voice call to Client 1.
6. Check for SS notification on DUT.
7. Answer call on DUT.
8. At Client 2, end voice call to DUT.

**Expected behaviour**

**Normal Call**

1. DUT is alerting. DUT displays CLIP information of Client 1.
2. 2-Way audio connection is established.
3. Voice call is ended between DUT and Client 1.

**Call Forwarding notification check**

4. Call Forwarding is successfully set up from Client 1 to DUT.
5. DUT is alerting. DUT displays CLIP information of Client 2.
6. DUT displays SS notification "Forwarded Call" or similar. (SS notification support is network dependent)
7. 2-Way audio connection is established.
8. Voice call is ended between DUT and Client 2.

### 40.3 VOID

These Test Cases have been merged and moved to section 42.7 and 42.8.

### 40.4 DTMF emission

**Description**

The DUT can transmit DTMF tones during a voice call.

**Related GSM core specifications**

TS 24.008 sub clause 5.5.7

**Reason for test**

To ensure the DUT can transmit DTMF tones during a voice call.

**Initial configuration**

DUT is in Idle mode.

Client 1 is capable of interpreting DTMF tones (e.g. voicemail system).

**Test procedure**

**Scenario A: Direct input**

1. Delete all entries in DUT phonebook.
2. At DUT, make MO voice call to Client 1.
3. Using DUT keypad, successfully send DTMF tones for digits 0-9, *, and #.

**Scenario B: From phonebook**

1. Store Client 1 ADN in DUT phonebook with a pause, followed by digits 0-9, *, and #, e.g. +441111111111P0123456789*#
2. Direct from DUT phonebook, make MO voice call to Client 1.
3. Observe the DTMF tones stored after the Pause are sent correctly.

**Expected behaviour**

1. DUT phonebook is updated.
2. Voice call is established between DUT and Client.
3. DTMF tones for digits 0-9, *, and # are sent correctly and interpreted by the Client.

40.5 Emergency calls

NOTE: Field testing of emergency calls should only be performed with the prior agreement of and in co-operation with the network operator and the authorities in the country concerned. If such co-operation is not available, then field tests of emergency call should be carried out on artificial environments (System Simulator, Test Bed), or the call shall be dropped before the alerting phase.

40.5.1 Emergency calls, with SIM/USIM, no emergency number stored

NOTE: It will be left to the national authorities to decide whether the network should accept emergency calls for test procedures 9-12 and 15 (3GPP TS 22.101). In any case, the device shall attempt an emergency call setup, which then might be aborted by the network.

Description
The UE shall make an outgoing emergency call attempt.

Related GSM core specifications
Up to R98: 3GPP TS 02.30 clause 8
From R99 upwards: 3GPP TS 22.101 R99 clause 8
For SIM Lock (ME Personalisation): 3GPP TS 22.022 Annex A.2

Reason for test
To ensure that the UE can complete an emergency call in a variety of circumstances

Initial configuration
UE switched on, SIM/USIM being inserted, no information into SIM/USIM (EFECC) of the SIM/USIM.
Tests 1 to 6: UE to be attached to the CS network first.
Test 11 and 12 requires a deactivated SIM. A deactivated SIM is a SIM where the network responds with “IMSI Unknown in HLR” to a location update attempt of a device with this SIM.
Test 21 and 22 requires the ME to be SIM Locked and a SIM Card which fails the personalisation check of the SIM Locked ME (e.g. a SIM card from another operator is inserted).

Note: In case if the network performs authentication for the SIM card which fails the personalisation check, use deactivated SIM (similar as in test 11 and 12) in order to avoid authentication procedure and have successful emergency call setup.
This note is subject to deletion at GSMA TSG FTSG#43 (September 2013) unless the FTSG decides to keep this note.

Test procedure
1. Make an emergency call to the international emergency numbers 112 and 911
2. Make an emergency call dialling successively 08, 000, 110, 118, 119, 999
3. Make an emergency call dialling any other specific national emergency number of the country
4. Make an emergency call without dialling any dedicated number, if the UE MMI allows so (such as use of the menu, of a ‘special button’, etc.)
5. Repeat procedure 1 when the keypad is blocked
6. Repeat procedure 2 when keypad is blocked
7. Repeat procedure 1 when FDN is activated
8. Repeat procedure 2 when FDN is activated
9. Repeat procedure 1 after no more suitable cell available, UE camped on an acceptable cell (forbidden PLMN). Check that IMEI is not used as mobile identity (TMSI or IMSI shall be used).

10. Repeat procedure 2 after no more suitable cell available, UE camped on an acceptable cell (forbidden PLMN)

11. In this step a deactivated SIM/USIM is used, i.e. the network responds with “IMSI unknown in HLR” to the location update attempt. After switching on the device a sufficient time is waited to allow the network to reject location update (display shall indicate that no service available). Then step 1 is repeated where it is checked that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

12. In this step a deactivated SIM/USIM is used, i.e. the network responds with “IMSI unknown in HLR” to the location update attempt. After switching on the device a sufficient time is waited to allow the network to reject location update (display shall indicate that no service available). Then step 1 is repeated where it is checked that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

13. Repeat procedure 1 when the UE is locked

14. Repeat procedure 2 when the UE is locked

15. Repeat procedure 1 when no PIN has been entered.

16. Repeat procedure 2 when no PIN has been entered

17. Repeat procedure 1 when PIN is blocked

18. Repeat procedure 2 when PIN is blocked

19. Repeat procedure 1 when the PUK is blocked

20. Repeat procedure 2 when the PUK is blocked

21. Repeat procedure 1 when the UE is SIM Locked and a personalisation check fails (e.g. a SIM card from another operator is inserted)

22. Repeat procedure 2 when the UE is SIM Locked and a personalisation check fails (e.g. a SIM card from another operator is inserted).

**Expected behaviour**

1. The MS shall complete each call correctly: specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services.

2. Normal call set-up shall be initiated, but no emergency call shall occur.

3. Normal call set-up shall be initiated to national emergency services, but no emergency call shall occur.

4. Same behaviour as 1.

5. Same behaviour as 1.

6. No reactions from the UE expected. Keypad shall remain blocked.

7. Same behaviour as 1.

8. No call establishment

9. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

10. No call establishment (refused by network).

11. Same behaviour as 1. The IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

12. No call establishment. The IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

13. Same behaviour as 1.

14. No call establishment.
15. Same behaviour as 1.
16. No call establishment.
17. Same behaviour as 1.
18. No call establishment.
19. Same behaviour as 1.
20. No call establishment.
21. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).
   Note: The UE is expected only to include IMSI Identity and not to have successful security procedures (as per 3GPP TS 33.102, chapter 6.4.9.2)
22. No call establishment.
   Note: The UE is expected only to include IMSI Identity and not to have successful security procedures (as per 3GPP TS 33.102, chapter 6.4.9.2)

40.5.2 Emergency calls, with SIM/USIM, emergency numbers stored on EF_ECC

NOTE: It will be left to the national authorities to decide whether the network should accept emergency calls for test procedures 12-17 and 21 (3GPP TS 22.101). In any case, the device shall attempt an emergency call setup, which then might be aborted by the network.

Description
The UE shall make an outgoing emergency call.

Related GSM core specifications
Up to R98: 3GPP TS 02.30 clause 8
From R99 upwards: 3GPP TS 22.101 R99 clause 8
For SIM Lock (ME Personalisation): 3GPP TS 22.022 Annex A.2

Reason for test
To ensure that the UE can complete an emergency call in a variety of circumstances

Initial configuration
- Emergency numbers stored into SIM/USIM (EF_ECC) of the SIM/USIM
- SIM/USIM inserted in the ME
- PIN protection is activated
- UE switched on
- UE in idle mode (only for Test Procedures 1-20)
- Test 15, 16 and 17 requires a deactivated SIM. A deactivated SIM is a SIM where the network responds with “IMSI Unknown in HLR” to a location update attempt of a device with this SIM.
- Test 30, 31 and 32 requires the ME to be SIM Locked and a SIM Card which fails the personalisation check of the SIM Locked ME (e.g. a SIM card from another operator is inserted).

Test procedure
1. Make an emergency call to the international emergency numbers 112 and 911
2. Make an emergency call dialling successively all numbers stored in SIM/USIM (EF_ECC)
3. Make an emergency call dialling successively 08, 000, 110, 118, 119, 999 except if this number is stored in EF_ECC
4. Make an emergency call dialling any other specific national emergency number of the country
5. Make an emergency call without dialling any dedicated number, if the UE MMI allows so (such as use of the menu, of a ‘special button’, etc.)

6. Repeat procedure 1 when the keypad is blocked

7. Repeat procedure 2 when keypad is blocked

8. Repeat procedure 3 when keypad is blocked

9. Repeat procedure 1 when FDN is activated

10. Repeat procedure 2 when FDN is activated

11. Repeat procedure 3 when FDN is activated

12. Repeat procedure 1 after no more suitable cell available, UE camped on an acceptable cell (forbidden PLMN). Check that the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

13. Repeat procedure 2 after no more suitable cell available, UE camped on an acceptable cell (forbidden PLMN). Check that the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

14. Repeat procedure 3 after no more suitable cell available, UE camped on an acceptable cell (forbidden PLMN)

15. In this step a deactivated SIM/USIM is used, i.e. the network responds with “IMSI unknown in HLR” to the location update attempt. After switching on the device a sufficient time is waited to allow the network to reject location update (display shall indicate that no service available). Then step 1 is repeated where it is additionally checked that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

16. In this step a deactivated SIM/USIM is used, i.e. the network responds with “IMSI unknown in HLR” to the location update attempt. After switching on the device a sufficient time is waited to allow the network to reject location update (display shall indicate that no service available). Then step 2 is repeated where it is additionally checked that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

17. Repeat procedure 3 when the IMSI is unknown in HLR, i.e. a deactivated SIM/USIM is used

18. Repeat procedure 1 when the UE is locked

19. Repeat procedure 2 when the UE is locked

20. Repeat procedure 3 when the UE is locked

21. Repeat procedure 1 when no PIN has been entered

22. Repeat procedure 2 when no PIN has been entered

23. Repeat procedure 3 when no PIN has been entered

24. Repeat procedure 1 when PIN is blocked

25. Repeat procedure 2 when PIN is blocked

26. Repeat procedure 3 when PIN is blocked

27. Repeat procedure 1 when the PUK is blocked

28. Repeat procedure 2 when the PUK is blocked

29. Repeat procedure 3 when the PUK is blocked

30. Repeat procedure 1 when the UE is SIM Locked and a personalisation check fails (e.g. a SIM card from another operator is inserted)

31. Repeat procedure 2 when the UE is SIM Locked and a personalisation check fails (e.g. a SIM card from another operator is inserted)

32. Repeat procedure 3 when the UE is SIM Locked and a personalisation check fails (e.g. a SIM card from another operator is inserted).
Expected behaviour

1. The MS shall complete each call correctly: specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services.

2. Same behaviour as 1.

3. Normal call set-up shall be initiated, but no emergency call shall occur.

4. Normal call set-up shall be initiated to national emergency services, but no emergency call shall occur.

5. Same behaviour as 1.

6. Same behaviour as 1.

7. Same behaviour as 1.

8. No reactions from the UE expected. Keypad shall remain blocked.

9. Same behaviour as 1.

10. Same behaviour as 1.

11. No call establishment

12. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

13. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

14. No call establishment (refused by network).

15. Same behaviour as 1. The IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

16. Same behaviour as 1. The IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

17. No call establishment

18. Same behaviour as 1.

19. Same behaviour as 1.

20. No call establishment

21. Same behaviour as 1.

22. Same behaviour as 1.

23. No call establishment

24. Same behaviour as 1.

25. Same behaviour as 1.

26. No call establishment

27. Same behaviour as 1.

28. Same behaviour as 1.

29. No call establishment

30. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

31. Same behaviour as 1 and the IMEI is not used as mobile identity (TMSI or IMSI shall be used).

32. No call establishment.
40.5.3 Emergency calls, without SIM/USIM

NOTE: It will be left to the national authorities to decide whether the network should accept emergency calls without the SIM/USIM (3GPP TS 22.101). In any case, the device shall attempt an emergency call setup, which then might be aborted by the network.

Description
The device shall make an outgoing emergency call attempt even without SIM/USIM.

Related GSM core specifications
Up to R98: 3GPP TS 02.30 clause 8
From R99 upwards: 3GPP TS 22.101 R99 clause 8

Reason for test
To ensure that the device can complete an emergency call in a variety of circumstances

Initial configuration
Device switched-on, SIM/USIM inserted or not, as indicated in the test procedure below

The emergency numbers in EFECC are listed for step 5.

Test procedure
1. With no SIM/USIM inserted, make an emergency call to the international emergency numbers 112 and 911. Check that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).
2. With no SIM/USIM inserted, make an emergency call dialling successively 08, 000, 110, 118, 119 and 999. Check that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).
3. With no SIM/USIM inserted, make an emergency call without dialling any dedicated number, if the UE MMI allows so (such as use of the menu, of a 'special button', etc.). Check that the IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).

Expected behaviour
1. The device shall complete each call correctly: specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services. The IMEI is used as mobile identity (neither TMSI nor IMSI shall be used).
2. Same behaviour as 1.
3. Same behaviour as 1.

40.6 WB-AMR

40.6.1 Mobile originated calls

40.6.1.1 Mobile originated call complete to WB-AMR device

Description
The DUT shall make an outgoing WB-AMR voice call.

Related core specifications

Reason for test
To ensure the DUT can make an outgoing WB-AMR voice call to another WB-AMR supporting client.
Initial configuration
DUT in idle mode.
DUT and Client 1 camping to a RAT supporting WB-AMR.
DUT and Client 1 have WB-AMR voice codec enabled.

Test procedure
1. At DUT, make MO voice call to Client 1.
2. Answer call on Client 1.
3. At DUT, end voice call to Client 1.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way WB-AMR audio connection is established.
   Observe the voice clarity to check for WB-AMR codec.
   If available, use a measuring tool or internal monitor to check the codec rate of the call is WB-AMR.
3. Voice call is ended between DUT and Client 1.

40.6.1.2 Mobile originated call complete to non WB-AMR device

Description
When DUT attempts a WB-AMR call to a NB device, it shall successfully establish the voice call in NB codec.

Related core specifications

Reason for test
To ensure that WB-AMR devices establish voice calls to non WB-AMR supporting device.

Initial configuration
DUT in idle mode.
DUT and Client 1 camping to a RAT supporting WB-AMR.
DUT has WB-AMR voice codec enabled.
Client 1 does not support WB-AMR voice codec.

Test procedure
1. At DUT, make MO voice call to Client 1.
2. Answer call on Client 1.
3. At DUT, end voice call to Client 1.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way NB audio connection is established.
3. Voice call is ended between DUT and Client 1.
40.6.1.3 Mobile originated call complete to non WB-AMR device (network supporting transcoding to G.711)

Description
When DUT attempts a WB-AMR call to a NB device, it shall successfully establish the voice call with transcoding to G.711 if supported by the network.

Related core specifications

Reason for test
To ensure that WB-AMR devices establish voice calls to non WB-AMR supporting device.

Initial configuration
DUT in idle mode.
DUT and Client 1 camping to a RAT supporting WB-AMR.
DUT has WB-AMR voice codec enabled.
Client 1 does not support WB-AMR voice codec.
Network supports transcoding to G.711.

Test procedure
1. At DUT, make MO voice call to Client 1.
2. Answer call on Client 1.
3. At DUT, end voice call to Client 1.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. Network transcodes WB-AMR call to G.711.
   2-Way audio connection is established.
   WB-AMR codec is in use at DUT.
   NB codec is in use at Client 1.
3. Voice call is ended between DUT and Client 1.

40.6.2 Mobile Terminated calls

40.6.2.1 Mobile Terminated call complete from WB-AMR device

Description
The DUT shall receive an incoming WB-AMR voice call.

Related core specifications

Reason for test
To ensure the DUT can receive an incoming WB-AMR voice call from another WB-AMR supporting client.

Initial configuration
DUT in idle mode.
DUT and Client 1 camping to a RAT supporting WB-AMR.
DUT and Client 1 have WB-AMR voice codec enabled.
Test procedure
1. At DUT, receive MT voice call from Client 1.
2. Answer call on DUT.
3. At Client 1, end voice call to DUT.

Expected behaviour
1. DUT is alerting. DUT displays CLIP information of Client 1.
2. 2-Way WB-AMR audio connection is established.
   Observe the voice clarity to check for WB-AMR codec.
   If available, use a measuring tool or internal monitor to check the codec rate of the call is WB-AMR.
3. Voice call is ended between DUT and Client 1.

40.6.3 WB-AMR Codec mode tests

40.6.3.1 WB-AMR codec mode is changed (2G to 2G)

Description
Two identical WB-AMR DUTs camp in a GSM WB-AMR test bed network. A WB-AMR call is performed between both devices. The RF quality of the 2nd device is changed to stimulate a codec mode downgrade in uplink and downlink. The WB-AMR call is continued with the changed codec mode.

Related core specifications

Reason for test
To ensure that the WB-AMR codec mode in the DUT is changed when the remote network requests this.

Initial configuration
Two identical DUTs supporting WB-AMR are required for this test. A well-known test environment or test bed is required for the 2nd device. Uplink and downlink RF quality is always good for both devices. The RF quality for the 2nd device can be decreased by interfering a signal in uplink or downlink.

All Radio Access Technologies (2G or 3G) used in this test support WB-AMR.

Test procedure
1. Both DUTs camp in a 2G RAT. A WB-AMR call is established between both devices. During call setup for both devices an identical set of codec modes (ACS, Active Codec Set) with 1 to 4 AMR codec modes is defined by the BTSs. Further a list of switching thresholds and hysteresis is defined.
2. Now both, the 1st and 2nd DUT detect a good uplink or downlink quality. They send a Codec Mode Request (CMR) with a better codec mode to its BTS. This CMR is transferred to the remote BTS which sends a Codec Mode Command (CMC) to the remote device. This device uses immediately the new codec mode and responses with CMI which is sent back to the device requesting the new data rate. This continues until the highest CODEC_MODE is used by both devices.

   Downgrading in Uplink
3. The uplink RF quality for 2nd device is decreased by interfering a signal until the BTS of the 2nd device detects a bad uplink quality and sends CMC with a lower codec rate to the 2nd device.
4. Step 3 is repeated until the BTS sends a CMC with the lowest codec rate (CODEC_MODE_1) to the 2nd device.
5. The interference signal is removed. Now the Codec Mode Requests from the 1st device are accepted by BTS2 and the codec rate of the 2nd device is increased to the highest mode as in step 2.

**Downgrading in Downlink**

6. The downlink RF quality for 2nd device is decreased by interfering a signal until the 2nd device sends CMR with a lower codec rate to the 1st device. This CMR is transferred to the BTS of the 1st device which sends a CMC with the lower codec rate to the device.

7. Step #6 is repeated until the 2nd device sends a CMR with the lowest codec rate (CODEC_MODE_1) to the 1st device.

8. The interference signal is removed. Now the 2nd device detects the increased quality and sends a CMR to the 1st device to increase downlink codec mode. This continues until the highest mode is reached as in step 2.

**Expected behaviour**

1. A WB-AMR call with an Initial Codec Mode (ICM) of 6.6 kbps in uplink and downlink is established. The Active Codec Set contains more than one codec mode.

2. Both devices send a CMR to upgrade the codec rate of the remote device. The device receiving the CMC is instantly changing the coding rate. This continues until the highest codec mode is reached.

3. With receiving the CMC from the BTS the 2nd device is immediately using the new codec mode and sends CMI with the new codec mode to the 1st device.

4. With each repeating of step 3 a lower codec rate is commanded by BTS 1 until the lowest codec rate is reached.

5. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

6. With receiving the CMC the 1st device immediately uses the new codec mode and sends CMI with the new codec mode to the 2nd device.

7. With each repeating of step 7 a lower rate is commanded by the 2nd device until the lowest codec rate is reached.

8. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

**40.6.3.2 WB-AMR codec mode is changed (3G to 3G)**

**Description**

Two identical WB-AMR DUTs camp in a UMTS WB-AMR test bed network. A WB-AMR call is performed between both devices. The RF quality of the 2nd device is changed to stimulate a codec downgrade in uplink and downlink. The WB-AMR call is continued with the changed codec mode.

**Related core specifications**


**Reason for test**

To ensure that the WB-AMR codec mode in the DUT is changed when the remote network requests this.

**Initial configuration**

Two identical DUTs supporting WB-AMR are required for this test. A well-known test environment or test bed is required for the 2nd device. Uplink and downlink RF quality is always good for both devices. The RF quality for the 2nd device can be decreased by interfering a signal in uplink or downlink.

All Radio Access Technologies (3G) used in this test support WB-AMR.
Test procedure

1. Both DUTs camp in a 3G RAT. A WB-AMR call is established between both devices. During call setup for both devices an identical set of codec modes (ACS, Active Codec Set) with 1 to 4 AMR codec modes is defined by the network. Further a list of switching thresholds and hysteresis are defined.

2. Now both, the 1st and 2nd device detect a good uplink or downlink quality. They send a Codec Mode Request (CMR) with a better codec mode to its RNC. This CMR is transferred to the remote RNC which sends a Codec Mode Command (CMC) to the remote device. This device uses immediately the new codec mode and responds with CMI which is sent back to the device requesting the new data rate. This continues until the highest CODEC_MODE is used by both devices in up- and downlink.

    **Downgrading in Uplink**

3. The uplink RF quality for the 2nd device is decreased by interfering a signal until the network detects a bad uplink quality of the 2nd device and sends CMC with a lower codec rate to the 2nd device.

4. Step 3 is repeated until the network sends a CMC with the lowest codec rate (CODEC_MODE_1) to the 2nd device.

5. The interference signal is removed. Now the Codec Mode Requests from the 1st device are accepted by the network and the codec rate of the 2nd device is increased to the highest mode as in step 2.

    **Downgrading in Downlink**

6. The downlink RF quality for 2nd device is decreased by interfering a signal until the 2nd device sends CMR with a lower codec rate to the 1st device. This CMR is transferred to the network of the 1st device which sends a CMC with the lower codec rate to the device.

7. Step #6 is repeated until the 2nd device sends a CMR with the lowest codec rate (CODEC_MODE_1) to the 1st device.

8. The interference signal is removed. Now the 2nd device detects the increased quality and sends a CMR to the 1st device to increase downlink codec mode. This continues until the highest mode is reached as in step 2.

Expected behaviour

1. A WB-AMR call with an Initial Codec Mode (ICM) of 6.6 kbps in uplink and downlink is established. The Active Codec Set contains more than one codec mode.

2. Both devices send a CMR to upgrade the codec rate of the remote device. The device receiving the CMC is instantly changing the coding rate. This continues until the highest codec mode is reached.

3. With receiving the CMC from the RNC the 2nd device is immediately using the new codec mode and sends CMI with the new codec mode to the 1st device.

4. With each repeating of step 3 a lower codec rate is commanded by the network 1 until the lowest codec rate is reached.

5. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

6. With receiving the CMC the 1st device immediately uses the new codec mode and sends CMI with the new codec mode to the 2nd device.

7. With each repeating of step 7 a lower rate is commanded by the 2nd device until the lowest codec rate is reached.

8. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.
40.6.3.3  WB-AMR codec mode is changed (2G to 3G)

40.6.3.3.1  WB-AMR codec mode is changed (2G to 3G, ordered from 2G)

Description
Two identical WB-AMR DUTs are required for this test. The devices support WB-AMR in both 2G and 3G. The 1st device camps in a 3G cell, the 2nd device in a 2G cell. A WB-AMR call is performed between both devices. The RF quality of the 2nd device is changed to stimulate a codec mode downgrade in uplink and downlink. The WB-AMR call is continued with the changed codec mode.

Related core specifications

Reason for test
To ensure that the WB-AMR codec mode in the DUT in 3G is changed when the remote network (2G) requests this.

Initial configuration
Two identical DUTs supporting WB-AMR are required for this test. A well-known test environment or test bed is required for the 2nd device. Uplink and downlink RF quality is always good for both devices. The RF quality for the 2nd device (in 2G) can be decreased by interfering a signal in uplink or downlink.

All Radio Access Technologies (2G or 3G) used in this test support WB-AMR.

Test procedure
1. The 1st device camps in a 3G cell, the 2nd device in a 2G cell. A WB-AMR call is established between both devices. During call setup for both devices an identical set of codec modes (ACS, Active Codec Set) with 1 to 4 AMR codec modes is defined by the BTSs. Further a list of switching thresholds and hysteresis is defined.
2. Now both, the 1st and 2nd DUT detect a good uplink or downlink quality. They send a Codec Mode Request (CMR) with a better codec mode to their network. This CMR is transferred to the remote network which sends a Codec Mode Command (CMC) to the remote device. This device uses immediately the new codec mode and responses with CMI which is sent back to the device requesting the new data rate. This continues until the highest CODEC_MODE is used by both devices.

   **Downgrading in Uplink**

3. The uplink RF quality for the 2nd device is decreased by interfering a signal until the BTS of the 2nd device detects a bad uplink quality and sends CMC with a lower codec rate to the 2nd device.
4. Step 3 is repeated until the BTS sends a CMC with the lowest codec rate (CODEC_MODE_1) to the 2nd device.
5. The interference signal is removed. Now the Codec Mode Requests from the 1st device are accepted by network and the codec rate of the 2nd device is increased to the highest mode as in step 2.

   **Downgrading in Downlink**

6. The downlink RF quality for 2nd device is decreased by interfering a signal until the 2nd device sends CMR with a lower codec rate to the 1st device. This CMR is transferred to the network of the 1st device which sends a CMC with the lower codec rate to the device.
7. Step #6 is repeated until the 2nd device sends a CMR with the lowest codec rate (CODEC_MODE_1) to the 1st device.
8. The interference signal is removed. Now the 2nd device detects the increased quality and sends a CMR to the 1st device to increase downlink codec mode. This continues until the highest mode is reached as in step 2.
Expected behaviour

1. A WB-AMR call with an Initial Codec Mode (ICM) of 6.6 kbps in uplink and downlink is established. The Active Codec Set contains more than one codec mode.

2. Both devices send a CMR to upgrade the codec rate of the remote device. The device receiving the CMC is instantly changing the coding rate. This continues until the highest codec mode is reached.

3. With receiving the CMC from the BTS the 2nd device is immediately using the new codec mode and sends CMI with the new codec mode to the 1st device.

4. With each repeating of step 3 a lower codec rate is commanded by BTS 1 until the lowest codec rate is reached.

5. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

6. With receiving the CMC the 1st device immediately uses the new codec mode and sends CMI with the new codec mode to the 2nd device.

7. With each repeating of step 7 a lower rate is commanded by the 2nd device until the lowest codec rate is reached.

8. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

40.6.3.3.2 WB-AMR codec mode is changed (2G to 3G, ordered from 3G)

Description

Two identical WB-AMR DUTs are required for this test. The devices support WB-AMR in both 2G and 3G. The 1st device camps in a 2G cell, the 2nd device in a 3G cell. A WB-AMR call is performed between both devices. The RF quality of the 2nd device is changed to stimulate a codec mode downgrade in uplink and downlink. The WB-AMR call is continued with the changed codec mode.

Related core specifications


Reason for test

To ensure that the WB-AMR codec mode in the DUT in 3G is changed when the remote network (3G) requests this.

Initial configuration

Two identical DUTs supporting WB-AMR are required for this test. A well-known test environment or test bed is required for the 2nd device. Uplink and downlink RF quality is always good for both devices. The RF quality for the 2nd device (in 3G) can be decreased by interfering a signal in uplink or downlink.

All Radio Access Technologies (2G or 3G) used in this test support WB-AMR.

Test procedure

1. The 1st device camps in a 2G cell, the 2nd device in a 3G cell. A WB-AMR call is established between both devices. During call setup for both devices an identical set of codec modes (ACS, Active Codec Set) with 1 to 4 AMR codec modes is defined by the BTSs. Further a list of switching thresholds and hysteresis is defined.

2. Now both, the 1st and 2nd DUT detect a good uplink or downlink quality. They send a Codec Mode Request (CMR) with a better codec mode to their network. This CMR is transferred to the remote network which sends a Codec Mode Command (CMC) to the remote device. This device uses immediately the new codec mode and responses with CMI which is sent back to the device requesting the new data rate. This continues until the highest CODEC_MODE is used by both devices.
**Downgrading in Uplink**

3. The uplink RF quality for 2nd device is decreased by interfering a signal until the network of the 2nd device detects a bad uplink quality and sends CMC with a lower codec rate to the 2nd device.

4. Step 3 is repeated until the network sends a CMC with the lowest codec rate (CODEC_MODE_1) to the 2nd device.

5. The interference signal is removed. Now the Codec Mode Requests from the 1st device are accepted by network 2 and the codec rate of the 2nd device is increased to the highest mode as in step 2.

**Downgrading in Downlink**

6. The downlink RF quality for 2nd device is decreased by interfering a signal until the 2nd device sends CMR with a lower codec rate to the 1st device. This CMR is transferred to the BTS of the 1st device which sends a CMC with the lower codec rate to the device.

7. Step #6 is repeated until the 2nd device sends a CMR with the lowest codec rate (CODEC_MODE_1) to the 1st device.

8. The interference signal is removed. Now the 2nd device detects the increased quality and sends a CMR to the 1st device to increase downlink codec mode. This continues until the highest mode is reached as in step 2.

**Expected behaviour**

1. A WB-AMR call with an Initial Codec Mode (ICM) of 6.6 kbps in uplink and downlink is established. The Active Codec Set contains more than one codec mode.

2. Both devices send a CMR to upgrade the codec rate of the remote device. The device receiving the CMC is instantly changing the coding rate. This continues until the highest codec mode is reached.

3. With receiving the CMC from the network the 2nd device is immediately using the new codec mode and sends CMI with the new codec mode to the 1st device.

4. With each repeating of step 3 a lower codec rate is commanded by network 1 until the lowest codec rate is reached.

5. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

6. With receiving the CMC the 1st device immediately uses the new codec mode and sends CMI with the new codec mode to the 2nd device.

7. With each repeating of step 7 a lower rate is commanded by the 2nd device until the lowest codec rate is reached.

8. When receiving Codec Mode Commands the 1st device increases the coding rate until the highest codec mode is reached.

**40.6.3.4 WB-AMR codec is changed to non WB-AMR codecs**

**Description**

All Radio Access Technologies (2G or 3G) where the DUT camps in this test support WB-AMR.

The 2nd WB-AMR device camps in a RAT where the device supports WB-AMR. An WB-AMR call is performed between DUT and 2nd device. While the DUT stays in its cell the 2nd device is moved out of its cell so that a handover to a cell is performed where WB-AMR is not possible (either the network or the device does not support WB-AMR there). The tandem/transcoder free WB-AMR call is continued with AMR-NB, EFR or FR depending on the network capability/decision.

The test is repeated in all RATs in which the DUT supports WB-AMR.

**Related core specifications**

Reason for test
To ensure that a tandem/transcoder free WB-AMR call is continuously working when the remote WB-AMR call is handovered to a transcoded voice call.

Initial configuration
All Radio Access Technologies (2G or 3G) where the DUT (1st device) camp support WB-AMR. The RAT where the 2nd device initially camp support WB-AMR. This 2nd device can be handovered to a cell (2G or 3G) which does not support WB-AMR

Test procedure
1. The DUT camps in a RAT (2G or 3G) where it supports WB-AMR. The terminated WB-AMR device is switched on and camps in any RAT where it supports WB-AMR.
2. A WB-AMR call is performed between the DUT and the 2nd device.
3. While the DUT stays in its cell the 2nd device is moved out of the cell so that a handover to a cell is performed where WB-AMR is not supported.
4. The end-to-end voice call is checked.
5. The call is released from the originated device.

A) The test is repeated in all RATs in which the DUT supports WB-AMR.

Expected behaviour
1. -
2. A WB-AMR call is set up successfully.
3. When the DUT stays in 2G the tandem free WB-AMR call is continued as WB-AMR, AMR-NB, EFR, FR or HR depending on the network capability/decision. When the DUT stays in 3G the transcoder free WB-AMR call is continued as AMR-NB.
4. The voice call is working.
5. The call is released successfully.

A) The test is successfully in all RATs in which the DUT supports WB-AMR.
2. Download a large non-compressible file.
3. At DUT, make MO voice call to Client 1.
4. Answer call on Client 1.
5. At DUT, end voice call to Client 1.
6. Check PS Data session.
7. Disconnect the Tethering/PC Dialup connection.

**Expected behaviour**
1. PDP context is established on DUT.
2. The file download is ongoing
3. DUT is alerting. Client 1 displays CLIP information of DUT.
4. 2-Way WB-AMR audio connection is established.
   Observe the voice clarity to check for WB-AMR codec.
   If available, use a measuring tool or internal monitor to check the codec rate of the call is WB-AMR.
5. Voice call is ended between DUT and Client 1.
6. PS Data session is either still ongoing or has resumed after the call (network and RAT dependent).
7. The PDP context is deactivated.

40.6.4.2 Mobile Terminated call during ongoing PS data session

**Description**
DUT shall successfully perform WB-AMR voice calls during an ongoing PS data session.

**Related core specifications**

**Reason for test**
To ensure the DUT can successfully perform WB-AMR voice calls during an ongoing PS data session.

**Initial configuration**
DUT in idle mode.
DUT and Client 1 camping to a RAT supporting WB-AMR.
DUT and Client 1 have WB-AMR voice codec enabled.

**Test procedure**
1. Activate PDP Context on DUT by means of Tethering or DUN.
2. Download a large non-compressible file.
3. At DUT, receive MT voice call from Client 1.
4. Answer call on DUT.
5. At Client 1, end voice call to DUT.
6. Check PS Data session.
7. Disconnect the Tethering/PC Dialup connection.

**Expected behaviour**
1. PDP context is established on DUT.
2. The file download is ongoing
3. DUT is alerting. DUT displays CLIP information of Client 1.
4. 2-Way WB-AMR audio connection is established.
   Observe the voice clarity to check for WB-AMR codec.
   If available, use a measuring tool or internal monitor to check the codec rate of the call is WB-AMR.
5. Voice call is ended between DUT and Client 1.
6. PS Data session is either still ongoing or has resumed after the call (network and RAT dependent).
7. The PDP context is deactivated.

40.6.5 Further WB-AMR tests

40.6.5.1 DTMF emission during WB-AMR call

Description
The DUT can transmit DTMF tones during a WB-AMR voice call.

Related core specifications

Reason for test
To ensure the DUT can transmit DTMF tones during a WB-AMR voice call.

Initial configuration
DUT is in Idle mode camping to a RAT supporting WB-AMR.
Client 1 is capable of interpreting DTMF tones (e.g. voicemail system).

Test procedure

Scenario A: Direct input
1. Delete all entries in DUT phonebook.
2. At DUT, make MO WB-AMR voice call to Client 1.
3. Using DUT keypad, successfully send DTMF tones for digits 0-9, * and #.

Scenario B: From phonebook
1. Store Client 1 ADN in DUT phonebook with a pause, followed by digits 0-9, * and #, e.g. +441111111111P0123456789*#
2. Direct from DUT phonebook, make MO WB-AMR voice call to Client 1.
3. Observe the DTMF tones stored after the Pause are sent correctly.

Expected behaviour
1. DUT phonebook is updated.
2. WB-AMR Voice call is established between DUT and Client.
3. DTMF tones for digits 0-9, * and # are sent correctly and interpreted by the Client.
41 Short Message Service (SMS)

41.1 SMS mobile originated

41.1.1 SC Address

Description
Enter the Service Centre address
Remark: the storage is done on the SIM card

Related GSM core specifications
GSM 03.40, GSM 04.11, GSM 11.11

Reason for test
To ensure that the MS correctly stores the SC address, so that SMS messages can be sent.

Initial configuration
Idle mode. SC Address not configured

Test procedure
Using the MMI procedures defined by the manufacturer, enter a valid, enabled SC address. Using the MMI procedures defined by the manufacturer verify that the proper SC address has been stored.

Using the MMI procedures defined by the manufacturer, create and send an SMS message. Ensure that the message is sent and is correctly received at its destination.

Expected behaviour
The proper SC address is stored. The message is sent and is correctly received at its destination.

41.1.2 SM Validity Period

Description
Enter the SM Validity period

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that the MS correctly stores the SM Validity Period.

Initial configuration
MS in Idle mode, SMSC supports validity period parameter handling.

Test procedure
Using the MMI procedures defined by the manufacturer, enter a valid SM Validity Period. Send an SMS message to another MS. Check the Validity period in the SMSC or via the Status Report facility of the MS and/or the network. Ensure that the receiving MS remains turned off until after the SM Validity Period has expired. When turning on the receiving MS, ensure that the SMS message has not been delivered.

Expected behaviour
The SMS message is not delivered.

41.1.3 SM Type

Description
Enter the SM Type
**Related GSM core specifications**
GSM 03.40, GSM 04.11, GSM 11.11

**Reason for test**
To ensure that the MS allows the SM Type to be changed by the user, and that messages of the correct type are sent.

**Initial configuration**
Idle mode

**Test procedure**
Using the MMI procedures defined by the manufacturer, select an SM Type. Send a message of that type. Ensure that the message is received, displayed and stored/deleted correctly by the addressed MS/TE supporting the SM type on the same way.

Repeat this procedure for each of the SM types supported by both the network and the MS.

**Expected behaviour**
For each of the SM types supported by both the network and the MS, the message is received correctly at its destination.

41.1.4 **Reply Path**

**Description**
Enter the Reply path

**Related GSM core specifications**
GSM 03.40, GSM 04.11

**Reason for test**
To ensure that where the MS supports sending messages with a Reply Path, that the MS correctly operates the SMS Reply path procedure, allowing a reply to use a specific Service Centre for a reply to an MO SMS message sent by the MS

**Initial configuration**
MS in idle mode. SMSC must be enabled for the reply.

**Test procedure**
Using MMI commands, set the Reply path in the MS. Send an MO SM with the Reply Path parameter included. Check that the message reaches its destination, and that a reply to the message can be returned via the correct service centre.

**Expected behaviour**
The message reaches its destination, and a reply to the message can be returned via the correct service centre.

41.1.5 **Status Report**

**Description**
Enter the Status Report parameter

**Related GSM core specifications**
GSM 03.40, GSM 04.11

**Reason for test**
To ensure that where the MS supports sending messages with a request to return a status report on delivery, that the parameter can be set in the MS and correctly results in the status reports being delivered.
Initial configuration
Idle mode

Test procedure
Using MMI commands, set the Status Report in the MS. Send an MO SM with the Status Report parameter included. Check that the message reaches its destination, and that the Status report is returned by the network and correctly received by the MS.

Expected behaviour
The message reaches its destination, and the Status report is returned by the network and correctly received by the MS.

41.1.6 Input SM (0 characters)

Description
Ensure that an empty SMS message can be stored and sent

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that the MS correctly stores and then sends an empty SMS message.

Initial configuration
Idle mode.

Test procedure
1. Using the MMI procedures defined by the manufacturer, create and send an empty SMS message.
2. Check that it is correctly received at its destination.

Expected behaviour
The message is correctly received at its destination.

41.1.7 Input SM (160 characters)

41.1.7.1 Input SM (160 characters) when using MMI language of Default 7-bit alphabet

Description
Ensure that an SMS message of 160 characters can be stored and sent.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that the MS correctly stores and sends an SMS message of 160 characters.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send an SMS message of 160 characters. Check that it is correctly received at its destination.

Expected behaviour
The message is correctly received at its destination.
41.1.7.2  Input SM (160 characters) when using MMI language of UCS2 alphabet & message content is default 7-bit alphabet

Description
Ensure that SM is coded in Default 7-bit alphabet (and not UCS2 Alphabet) with 160 characters.

Related GSM core specifications
N.A.

Reason for test
To ensure that SM is coded in Default 7-bit alphabet (and not UCS2 Alphabet) with 160 characters.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, switch display language to UCS2 (e.g. Hebrew). Create and send an SMS message of 160 characters (in Default 7 bit alphabet). Check that it is correctly received at its destination.

Expected behaviour
Only one message is correctly received at its destination.

41.1.8  Input Concatenated SM

41.1.8.1  Default 7-bit alphabet (over 160 characters)

Description
Where the MS supports SMS concatenation, ensure that an SMS message longer than 160 characters can be stored and sent. Ensure that the MS correctly displays the number of short messages which are sent. Ensure that the MS actually sends the indicated number of SMS.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that the MS correctly stores and sends an SMS message longer than 160 characters.

To ensure that the customer is aware how many messages are sent.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send concatenated SMS messages supporting the text (longer than 160 characters and max. capacity or 10, whichever comes first). Check the display if the number of sent messages is indicated and correct. Check that the SMS are correctly received at their destination, and that the entire text (longer than 160 characters and max. capacity) can be read without missing characters or redundancy.

Expected behaviour
The MS indicates correctly how many messages are sent. The messages are correctly received at its destination and the entire text can be read without missing characters or redundancy.

41.1.8.2  Extended default 7-bit alphabet (over 140 Bytes)

Description
Where the MS supports SMS concatenation, ensure that an SMS message longer than 140 Bytes can be stored and sent. Ensure that the MS correctly displays the number of short messages which are sent. Ensure that the MS actually sends the indicated number of SMS.
Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that the MS correctly stores and sends an SMS message longer than 140 Bytes.
To ensure that the customer is aware how many messages are sent.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send concatenated SMS messages supporting the text (longer than 140 Bytes). Check the display if the number of sent messages is indicated and correct. Check that the SMS are correctly received at their destination, and that the entire text (longer than 140 Bytes) can be read without missing characters or redundancy.

Expected behaviour
The MS indicates correctly how many messages are sent. The messages are correctly received at its destination and the entire text can be read without missing characters or redundancy.

41.1.8.3 UCS-2 alphabet (over 70 characters)

Description
Where the MS supports SMS concatenation, ensure that an SMS message longer than 70 UCS-2 characters can be stored and sent. Ensure that the MS displays the number of short messages which are sent. Ensure that the MS actually sends the indicated number of SMS.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that the MS correctly stores and sends an SMS message longer than 70 UCS-2 characters.
To ensure that the customer is aware how many messages are sent.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send concatenated SMS messages supporting the text (longer than 70 UCS-2 characters and max. capacity or 10 whichever comes first). Check the display if the number of sent messages is indicated and correct. Check that the SMS are correctly received at their destination, and that the entire text (longer than 70 UCS-2 characters and max. capacity or 10 whichever comes first) can be read without missing characters or redundancy.

Expected behaviour
The MS indicates correctly how many messages are sent. The messages are correctly received at its destination and the entire text can be read without missing characters or redundancy.

41.1.8.4 UCS-2 alphabet & default & extended default 7-bit alphabet (over 140 Bytes)

Description
Where the MS supports SMS concatenation and the possibility to mix UCS-2 & default and extended default 7-bit alphabets, ensure that an SMS message longer than 140 Bytes and max. capacity can be stored and sent.

Ensure that the MS displays the number of short messages which are sent. Ensure that the MS actually sends the indicated number of SMS.
Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that the MS correctly stores and sends an SMS message longer than 140 Bytes.
To ensure that the customer is aware how many messages are sent.

Initial configuration
Idle mode.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send concatenated SMS messages supporting the text (longer than 140 Bytes and max. capacity). Check the display if the number of sent messages is indicated and correct. Check that the SMS are correctly received at their destination, and that the entire text (longer than 140 Bytes and max. capacity) can be read without missing characters or redundancy.

Expected behaviour
The MS correctly indicates how many messages are sent. The messages are correctly received at its destination and the entire text can be read without missing characters or redundancy.

41.1.9 Input SM (EMS content)

Description
Ensure that an SMS message with EMS content can be stored and sent.

Related GSM core specifications
3GPP TS 23.040, GSM 04.11.

Reason for test
To ensure that the MS correctly stores and sends an SMS message with EMS content.

Initial configuration
Idle mode. The SMSC supports EMS correctly.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send an SMS message with EMS content. All supported EMS content type shall be tested. Check that it is correctly received at its destination.

Expected behaviour
The message is correctly received at its destination.

41.1.10 MO SMS during call

Description
The DUT should be able to send an MO SMS during an active call.

Related GSM core specifications
3GPP TS 23.040, GSM 03.40, GSM 04.11

Reason for test
To ensure the DUT can send an SMS during an active call.

Initial configuration
DUT in Idle Mode.

Test scenarios (overview)
Scenario A: Voice call.
Scenario B: FAX call.
Scenario C: Video call.
Scenario D: CS Data call with active download.
Scenario E: PS Data call with active download.

The below test procedure is applicable to all scenarios.

**Test procedure**

1. Establish call according to the scenario listed above.
2. During active call, create MO SMS at DUT and send to Client 1.
3. Open and read SMS at Client 1.

**Expected behaviour**

1. Successful call established.
2. An SMS can be created at DUT and is successfully sent to Client 1.
3. The SMS content is displayed correctly at Client 1.

### 41.1.11 When out of coverage

**Description**

Ensure that an SMS message can be prepared while the MS is out of coverage, and that the message is sent when the MS returns to the coverage area.

**Related GSM core specifications**

GSM 03.40, GSM 04.11

**Reason for test**

To ensure that the MS correctly prepares and stores an SMS message while the MS is out of coverage, and that the message is sent when the MS returns to the coverage area.

**Initial configuration**

Mobile out of coverage.

**Test procedure**

Using the MMI procedures defined by the manufacturer, create and send an SMS message. Move to an area with coverage. Ensure that the message is sent and is correctly received at its destination.

**Expected behaviour**

The message is sent and is correctly received at its destination.

### 41.2 SMS mobile terminated

#### 41.2.1 During mobile in idle mode

**Description**

Ensure that an SMS message can be received while the MS is in idle mode.

**Related GSM core specifications**

GSM 03.40, GSM 04.11

**Reason for test**

To ensure that the MS correctly accepts an SMS message when in idle mode.

**Initial configuration**

Idle mode.

Available storage for at least one SM in the SIM card.
Test procedure

Scenario A:
Arrange for an SMS message to be sent to the MS. Check that the message is received and the contents are correctly displayed.

Scenario B:
Arrange for an SMS message to be sent to the MS with an originator field that contains punctuation characters. Check that all characters in the originator field are shown correctly. Special characters like for example "* -" shall not be omitted.

Expected behaviour
The message is received and the contents are correctly displayed.

41.2.2 During mobile in idle mode with EMS content

Description
Ensure that an SMS message with EMS content can be received while the MS is in idle mode

Related GSM core specifications
3GPP TS 23.040, GSM 04.11

Reason for test
To ensure that the MS correctly accepts an SMS message with EMS content when in idle mode.

Initial configuration
Idle mode.
Available storage for at least one SM in the SIM card

Test procedure
Arrange for an SMS message (class 2) that contains EMS content to be sent to the MS. Check that the message is received and the contents are correctly displayed. All the EMS content type specified in the EMS specification shall be included.

Expected behaviour
If the mobile supports EMS the message is received and the contents are correctly displayed.
If the mobile does not support EMS the text part of the message shall be displayed.

41.2.3 Reception of unsupported SMs

Description
The incoming SM shall not cause the crash of the MS software even if it is not supported (either its type or content) or contains invalid information in the standard or in the user data header fields.

Related core specifications
3GPP TS 23.040, 24.011, 11.11, 31.102

Reason for test
To ensure that the MS remains operational when receiving

• unsupported SM type
• unsupported SM content
• SM containing invalid information in header fields

Initial configuration
MS is in idle mode. There are at least two free locations in SM memory.
Test procedure
Arrange for as many unsupported messages as possible from the list below to be sent to the MS under test. Check that the message is received and the mobile software does not freeze.

- Messages encoded in unsupported character sets (e.g. UCS, NSS, 8 Bit)
- Concatenated messages
- Unsupported OTA messages
- Messages that activate / deactivate fax, email, voice mail icons on the MS display
- WAP configuration messages

Expected behaviour
The software of the MS shall not freeze. If applicable the MS shall store the message. The MS may display the text content of the message. When applicable, the MS shall be able to forward the message.

41.2.4 MT SMS during call

Description
The DUT should be able to receive an MT SMS during an active call

Related GSM core specifications
3GPP TS 23.040, GSM 03.40, GSM 04.11, 3GPP TS 26.110, 3GPP TS 26.111

Reason for test
To ensure the DUT can receive an SMS during an active call.

Initial configuration
DUT in Idle Mode.

Test scenarios (overview)

Scenario A: Voice call.
Scenario B: FAX call.
Scenario C: Video call.
Scenario D: CS Data call with active download.
Scenario E: PS Data call with active download.

The below test procedure is applicable to all scenarios.

Test procedure
1. Establish call according to the scenario listed above.
2. At DUT, receive MT SMS from Client 1.
3. At DUT, end call.
4. At DUT, check for notification of received SMS.
5. At DUT, check SMS can be viewed and that content is not corrupted.

Expected behaviour
1. Successful call established.
2. SMS is received and the reception is indicated in a way that does not disturb the call.
3. Call is ended.
4. An indication is given that a new SMS has been received.
5. The SMS content is displayed correctly in a single SMS.
41.2.5  Acoustic signal, after new short message (no Class) arrived

Description
Where the MS can be configured to give an acoustic alert when an SM is received, ensure that the alert does in fact occur.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure if the MS can be configured to give an acoustic alert when an SM is received, the alert does in fact occur.

Initial configuration
Idle mode.

Available storage for at least one SM in the SIM card

Test procedure
Arrange for an SMS message to be sent to the MS. Check that the message is received and the alert is audible.

Repeat this test for the following conditions, if the features are supported
   1. When the MS is in the active state of a circuit-switched data call.
   2. When the MS is sending and receiving data using GPRS.

Expected behaviour
In each case, the message is received and the alert is audible.

41.2.6  Return call to the originating number

Description
Where the MS has an option to dial the originating number of an SM, ensure that the correct number is dialled.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that where the MS has an option to dial the originating number of an SM, the correct number is dialled.

Initial configuration
Idle mode.

Test procedure
Arrange for an SMS message to be sent to the MS. By means of the MMI commands in the MS, call the originating number. Check that the correct number has been dialled.

Expected behaviour
The SMS is received, and the correct number is dialled.

41.2.7  Call a number included in the text of the SM

Description
Where the MS has an option to dial a number included in the text of the SM, ensure that the correct number is dialled.

Related GSM core specifications
GSM 03.40, GSM 04.11
Reason for test
To ensure that where the MS has an option to dial a number included in the text of the SM, the correct number is dialled.

Initial configuration
Idle mode.

Test procedure
Arrange for an SMS message to be sent to the MS. By means of the MMI commands in the MS, call the number included in the text of the SM. Check that the number which has been dialled was the right one presented by the MMI.

Note: There are several mobile behaviours:
Some terminals only consider numbers between quotes ("...") , some do not filter anything
Some terminals in case of several numbers in the text present only the first one, other offer a choice to the user

Expected behaviour
The correct number is dialled.

41.2.8 Terminated Concatenated SM

41.2.8.1 Default 7-bit alphabet

Description
Ensure that terminated concatenated SM is reassembled correctly.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that terminated concatenated SM is reassembled correctly.

Initial configuration
Idle mode.

Test procedure
Arrange for a concatenated SMS message that contains 10 or maximum supported default 7 bit alphabet contents to be sent to the MS.

Check that:
1. Entire text can be read without missing characters or redundancy. All message content are correctly displayed. Check especially the reassembly points.
2. All content is displayed in one message.

Expected behaviour
The entire text can be read without missing characters or redundancy. All message content are correctly displayed. And all content is displayed in 1 message.

41.2.8.2 UCS2 alphabet

Description
Ensure that terminated concatenated SM is reassembled correctly.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11
Reason for test
To ensure that terminated concatenated SM is reassembled correctly.

Initial configuration
Idle mode.

Test procedure
Arrange for a concatenated SMS message that contains 10 or maximum supported UCS2 alphabet contents to be sent to the MS.

Check that:
1. Entire text can be read without missing characters or redundancy. All message content are correctly displayed. Check especially the reassembly points.
2. All content is displayed in one message.

Expected behaviour
The entire text can be read without missing characters or redundancy. All message content are correctly displayed. And all content is displayed in one message.

41.2.8.3 Terminated concatenated SM (over MS max. capacity)

Note: This test is only applicable for terminal devices which support less than 10 terminated SMSs.

Description
Ensure that an MS will receive properly terminated concatenated SM that is larger than its concatenation abilities

Related GSM core specifications
n/a

Reason for test
To ensure that an MS will receive properly terminated concatenated SM that is larger than its concatenation abilities

Initial configuration
Idle mode.

Test procedure
Arrange for a concatenated SMS message (over MS max. capacity) to be sent to the MS. Check that the text (up to MS capacity) can be read without missing characters or redundancy in one message. And the remaining text can be read without missing characters or redundancy in another SM.

Expected behaviour
The text (up to MS capacity) can be read without missing characters or redundancy in one message. And the remaining text can be read without missing characters or redundancy in another SM.

41.3 Message class 0 to 3 and type 0 (SMS mobile terminated)

41.3.1 SM class 0 (accept and displayed, but not stored)

Description
Ensure that a Class 0 SM is accepted and displayed but not stored.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that a Class 0 SM is accepted and displayed but not stored.
Initial configuration
Idle mode.

Test procedure
Arrange for a Class 0 SM to be sent to the MS. By means of the MMI commands in the MS, display
the SM and ensure that it has been correctly received. Turn the MS off and on again, and check that
the SM is not in the message storage memory.

Expected behaviour
The SM is received but not stored, and not available after the MS is switched off and on again.

41.3.2 SM class 1 (storing in ME and displaying)
Description
Ensure that a Class 1 SM is accepted, displayed and stored in the ME.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that a Class 1 SM is accepted, displayed and stored in the ME, if that feature is supported

Initial configuration
Idle mode.

Test procedure
Arrange for a Class 1 SM to be sent to the MS. By means of the MMI commands in the MS, display
the SM and ensure that it has been correctly received. Turn the MS off, and replace the SIM. Turn on
the MS and check that the SM is still in the mobile message storage memory. Place the original SIM in
another MS and ensure that the message is not in the message storage memory on the new MS.

Expected behaviour
The SMS is received and stored in the MS.

41.3.3 SM class 2 (storing in SIM and displaying)
Description
Ensure that a Class 2 SM is accepted, displayed and stored in the SIM.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that a Class 2 SM is accepted, displayed and stored in the SIM

Initial configuration
Idle mode.

Test procedure
Arrange for a Class 2 SM to be sent to the MS. By means of the MMI commands in the MS, display
the SM and ensure that it has been correctly received. Turn the MS off, and replace the SIM. Turn on
the MS and check that the SM is not in the message store. Place the original SIM in another MS and
ensure that the message is in the message store on the new MS.

Expected behaviour
The SMS is received and stored in the SIM.
41.3.4 SM class 3 (directly to the terminal equipment)

Description
Where the MS has an option for connection to terminal equipment, ensure that a Class 3 SM is accepted and passed directly to the TE.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that where the MS has an option for connection to terminal equipment, ensure that a Class 3SM is accepted and passed directly to the TE

Initial configuration
TE connected, MS in idle mode

Test procedure
Arrange for a Class 3 SM to be sent to the MS. By means of the MMI commands in the TE, display the SM in the TE and ensure that it has been correctly received. Then check the MS and ensure that the SM has not been placed in the message storage memories of the MS or of the SIM.

Expected behaviour
The SM is not placed in the message storage memories of the MS or of the SIM, but is passed directly to the TE.

41.3.5 Short Message type 0

Description
Ensure that a type 0 short message is correctly received and acknowledged to the network. This means that:-

- the MS is able to receive the type 0 short message irrespective of whether there is memory available in the SIM or ME
- the MS does not indicate the receipt of the type 0 short message to the user
- the type 0 short message shall not be automatically stored in the SIM or ME.

Related core specifications
3GPP TS 23.040, section 9.2.3.9; TS 24.011

Reason for test
To ensure that the MS correctly receives and acknowledges a type 0 short message as described above.

Initial configuration
MS in idle mode.
Available storage for at least one SM in the SIM card

Test procedure
Arrange for a type 0 SMS message to be sent to the MS. Check that the successful reception of the message is acknowledged to the network. Check that the MS does not indicate the receipt of this message to the user and that the message is not stored in the SIM or ME.

Repeat this test when the SIM and ME memory is full, if this condition can be arranged.

Expected behaviour
The message content shall be discarded but the successful reception of the type 0 SM is acknowledged to the network.
41.4 Reply Path (SMS mobile terminated)

41.4.1 Display of received SM (with Reply Path Set)

Description
Ensure that an SM with Reply Path parameter set is accepted and displayed.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an SM with Reply Path parameter set is accepted and displayed.

Initial configuration
Idle mode.
Available storage for at least one SM in the SIM card

Test procedure
Arrange for an SM with Reply Path parameter set to be sent to the MS. By means of the MMI commands in the MS, display the SM and ensure that it has been correctly received and that the Reply Path parameter is displayed correctly.

Expected behaviour
The SM is correctly received and the Reply Path parameter is displayed correctly.

41.4.2 Interpretation of the Reply Path Parameter during reading of SM

Description
Ensure that a reply to an SM with Reply Path parameter set is sent using the specified SC.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that a reply to an SM with Reply Path parameter set is sent using the specified SC.

Initial configuration
Idle mode.
Available storage for at least one SM in the SIM card

Test procedure
Arrange for an SM with Reply Path parameter set to be sent to the MS. By means of the MMI commands in the MS, create a reply to it and send the reply. Check that the reply is correctly received at its destination.

Expected behaviour
The reply is correctly received at its destination.

41.5 Replace mechanism for SM type 1-7 (SMS mobile terminated)

Description
Where the MS supports the Replace Short Message mechanism, ensure that a Replace Short Message of types 1 to 7 replaces an existing stored message of the same type.

Related GSM core specifications
GSM 03.40, GSM 04.11
Reason for test
To ensure that a Replace Short Message of types 1 to 7 replaces an existing stored message of the same type.

Initial configuration
Idle mode, with one or more messages stored that can be replaced by the Replace Short Message mechanism.

Test procedure
Arrange for an SM to receive a Replace Short Message with the same Replace Short Message type, associated SC address and originating address. By means of the MMI commands in the MS, check that the SM has been correctly received, and has overwritten the older message within the message storage memory.

Expected behaviour
The SM is correctly received, and overwrites the older message within the message storage memory.

41.6 Memory Capacity Notification

Description
Ensure that when memory on the SIM becomes available for receiving Class 2 SMs following an earlier memory full condition, the network is notified so that further SMs can be sent to the MS.

Related GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that when memory on the SIM becomes available for receiving Class 2 SMs following an earlier memory full condition, the network is notified so that further SMs can be sent to the MS.

Initial configuration
Idle mode, with the SIM memory full and unable to receive further Class 2 SMs.

Test procedure
Arrange for a Class 2 SM to be sent to the MS. Using MMI commands, delete one or more stored messages from the SIM. Ensure that the SM is subsequently received and stored on the SIM.

Expected behaviour
The SM is correctly received and stored on the SIM.

41.7 Short Message SIM data fields

41.7.1 Store MO-SM on the SIM and verify the contents of the SM data fields on the SIM

Description
Ensure that an outgoing SM is correctly stored on the SIM

Related GSM core specifications
GSM 03.40, GSM 11.11

Reason for test
To ensure that that an outgoing SM is correctly stored on the SIM.

Initial configuration
Idle mode.
Test procedure
Using MMI commands, enter a new MO SM and store it without sending it. Remove the SIM from the MS and check the contents using a SIM reader to ensure that the message is stored in the correct data field in the SIM.

Expected behaviour
The MO SM is stored in the correct data field in the SIM.

41.7.2 Store MT-SM (read) on SIM and verify content of the SM data fields on the SIM

Description
Ensure that a Class 2 MT-SM that has been read is correctly stored on the SIM.

Related GSM core specifications
GSM 03.40, GSM 11.11

Reason for test
To ensure that a Class 2 MT-SM that has been read is correctly stored on the SIM.

Initial configuration
Idle mode.

Test procedure
Arrange to receive a Class 2 MT-SM. Using MMI commands, display the SM and check that it has been received correctly. Remove the SIM from the MS and check the contents using a SIM reader to ensure that the message is stored in the correct data field in the SIM, with a correct indication of the contents and status of the SM.

Expected behaviour
The MT SM is stored in the correct data field in the SIM, with a correct indication of the contents and status of the SM.

41.7.3 Store MT-SM (unread) on SIM and verify cont. of the SM data fields on the SIM

Description
Ensure that a Class 2 MT-SM that has not been read is correctly stored on the SIM.

Related GSM core specifications
GSM 03.40, GSM 11.11

Reason for test
To ensure that a Class 2 MT-SM that has not been read is correctly stored on the SIM.

Initial configuration
Idle mode.

Test procedure
Arrange to receive a Class 2 MT-SM. Without displaying the SM, remove the SIM from the MS and check the contents using a SIM reader to ensure that the message is stored in the correct data field in the SIM, with a correct indication of the contents and status of the SM.

Expected behaviour
The MT SM is stored in the correct data field in the SIM, with a correct indication of the contents and status of the SM.
41.7.4 Delete SM on the SIM and verify the contents of the SM data fields on the SIM

Description
Ensure that a Class 2 MT-SM that has been read and deleted is correctly removed from the SIM.

Related GSM core specifications
GSM 03.40, GSM 11.11

Reason for test
To ensure that a Class 2 MT-SM that has been read and deleted is correctly removed from the SIM.

Initial configuration
Idle mode.

Test procedure
Arrange to receive a Class 2 MT-SM. Using MMI commands, display the SM and check that it has been received correctly, and then delete the SM. Remove the SIM from the MS and check the contents using a SIM reader to ensure that the message has been deleted and no longer remains on the SIM.

Expected behaviour
The message is deleted and no longer remains on the SIM.

41.8 SMS alphabet

41.8.1 Default 7-bit alphabet

41.8.1.1 Message storage

Description
Ensure that it is possible to include all the characters of the default 7-bit alphabet when creating a new SM, depending on which characters of the default alphabet are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that it is possible to include all the characters of the default 7-bit character set when creating a new SM to be sent.

Initial configuration
Idle mode.

Test procedure
Using MMI commands, create a message containing all the characters of the default 7-bit alphabet, and store the message. Retrieve the message and ensure that the characters are correctly displayed.

Expected behaviour
The characters are correctly displayed in the retrieved message.

41.8.1.2 Message transmission

Description
Ensure that all the characters of the default 7-bit alphabet are correctly transmitted in an SM as claimed to be supported by the mobile phone.
Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the default 7-bit alphabet are correctly transmitted in an SM.

Initial configuration
Idle mode.

Test procedure
Using MMI commands, send the message created in the previous test to another MS. Ensure that the message is correctly received, and that all the characters are correctly displayed, matching the characters entered.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.

41.8.1.3 Message reception

Description
Ensure that all the characters of the default 7-bit alphabet are correctly received and displayed in an SM, depending on which characters of the default alphabet are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the default 7-bit alphabet are correctly received and displayed in an SM.

Initial configuration
Idle mode.

Test procedure
Arrange for an SM containing all the characters of the default 7-bit alphabet to be sent from another MS. Ensure that the message is correctly received, and that all the characters are correctly displayed, matching the characters entered.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.

41.8.1.4 Character Counter

Description
Ensure that character counter increments/decrements correctly when typing a SMS using a default 7-bit character Irrespective of the MMI language (e.g. UCS-2 based) used.

Related GSM core specifications
n/a

Reason for test
To ensure that character counter increments/decrements correctly when typing a SMS using a default 7-bit character.

Initial configuration
The MS is in idle mode.
Test procedure
Write a SMS with at least one default 7-bit character. The character counter should increment/decrement correctly. Check that the maximum of 160 default 7-bit characters can be written in one SMS. Repeat this test with USC-2 MMI language.

Expected behaviour
The counter will increment/decrement correctly when using default 7-bit characters and the maximum of 160 default 7-bit characters can be written in one SMS irrespective of the MMI language used.

41.8.2 Extended default 7-bit alphabet

41.8.2.1 Message storage
Description
Ensure that it is possible to include all the characters of the extended default 7-bit alphabet (except National Language Single or Locking Shift Characters) when creating a new SM, depending on which characters of the extended default alphabet are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that it is possible to include all the characters of the extended default 7-bit character set when creating a new SM to be sent.

Initial configuration
Idle mode.

Test procedure
Using MMI commands, create a message containing all the characters of the extended default 7-bit alphabet (such as ‘^, {, }, \, |, \[, ~, \], €’ , excluding the National Language Single or Locking Shift Characters) and store the message. In case the MS doesn't have the possibility to save drafts, the MS may send the message to itself (i.e. to its own MSISDN). Retrieve the message and ensure that the characters are correctly displayed.

The maximum depends on the combination of default and extended default 7-bit characters based on the following rule:
N <= 140Bytes
with N=2X+Y, (X: extended default 7-bit character, Y: default 7-bit character) can be written in one SMS.

Expected behaviour
The characters are correctly displayed in the retrieved message.

41.8.2.2 Message transmission
Description
Ensure that all the characters of the extended default 7-bit alphabet are correctly transmitted in an SM as claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the extended default 7-bit alphabet are correctly transmitted in an SM.

Initial configuration
Idle mode.
Test procedure
Using MMI commands, send the message created in the previous test to another MS. Ensure that the message is correctly received, and that all the characters (such as ‘^’, {, }, |, [], ~, €) are correctly displayed, matching the characters entered.

The maximum depends on the combination of default and extended default 7-bit characters based on the following rule:

\[ N \leq 140\text{Bytes} \]

with \( N=2X+Y \), (X: extended default 7-bit character, Y: default 7-bit character) can be written in one SMS.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.

41.8.2.3 Message reception
Description
Ensure that all the characters of the extended default 7-bit alphabet are correctly received and displayed in an SM, depending on which characters of the extended default alphabet are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the extended default 7-bit alphabet are correctly received and displayed in an SM.

Initial configuration
Idle mode.

Test procedure
Arrange for an SM containing all the characters of the extended default 7-bit alphabet to be sent from another MS. Ensure that the message is correctly received, and that all the characters (such as ‘^’, {, }, |, [], ~, €) are correctly displayed, matching the characters entered.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.

41.8.2.4 Character Counter
Description
Ensure that character counter increments/decrements correctly 2 digits when typing a SMS using an extended default 7-bit character.

Related GSM core specifications
n/a

Reason for test
To ensure that character counter increments/decrements correctly when typing a SMS using an extended default 7-bit character.

Initial configuration
The MS is in idle mode.
Test procedure
Write a SMS with at least one extended default 7-bit character. The character counter should increment/decrement correctly by 2 digits per extended default 7-bit character. Check that the maximum of 80 extended default 7-bit characters can be written in one SMS.

Expected behaviour
The counter will increment/decrement correctly when using extended default 7-bit characters and the maximum of 80 default 7-bit characters can be written in one SMS.

41.8.3 UCS-2 alphabet

41.8.3.1 Message storage
Description
Ensure that it is possible to include a mix of UCS-2 characters from different alphabets when creating a new SM, depending on which characters are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that it is possible to include a mix of UCS-2 characters from different alphabets when creating a new SM to be sent.

Initial configuration
Idle mode.

Test procedure
Using MMI commands, create a message containing a mix of UCS-2 characters from different alphabets and store the message. In case the MS doesn’t have the possibility to save drafts, the MS may send the message to itself (i.e. to its own MSISDN). Retrieve the message and ensure that the characters are correctly displayed.

Expected behaviour
The characters are correctly displayed in the retrieved message.

41.8.3.2 Message transmission
Description
Ensure that all the characters of the UCS-2 alphabet are correctly transmitted in an SM as claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the UCS-2 alphabet are correctly transmitted in an SM.

Initial configuration
Idle mode.

Test procedure
Using MMI commands send the message created in the previous test to another MS. Ensure that the message is correctly received, and that all the characters are correctly displayed, matching the characters entered.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.
41.8.3.3 Message reception

Description
Ensure that all the characters of the UCS-2 alphabet are correctly received and displayed in an SM, depending on which characters of the default alphabet are claimed to be supported by the mobile phone.

Related GSM core specifications
GSM 03.40, GSM 03.38, GSM 04.11

Reason for test
To ensure that all the characters of the UCS-2 alphabet are correctly received and displayed in an SM.

Initial configuration
Idle mode.

Test procedure
Arrange for an SM containing all the characters of the UCS-2 alphabet to be sent from another MS. Ensure that the message is correctly received, and that all the characters are correctly displayed, matching the characters entered.

Expected behaviour
The message is correctly received, and all the characters are correctly displayed, matching the characters entered.

41.8.3.4 Character Counter

Description
Ensure that character counter increments/decrements correctly when typing a SMS using a UCS-2 character.

Related GSM core specifications
n/a

Reason for test
To ensure that character counter increments/decrements correctly when typing a SMS using a UCS-2 character.

Initial configuration
The MS is in idle mode.

Test procedure
Write a SMS with at least one UCS-2 character. The character counter should increment/decrement correctly. Check that the maximum of 70 UCS-2 characters can be written in one SMS.

Expected behaviour
The counter will increment/decrement correctly when using UCS-2 characters and the maximum of 70 UCS-2 characters can be written in one SMS.

41.9 Memory full condition (general function)

41.9.1 Store SM on the SIM; when SIM memory full

Description
Attempt to store a message on the SIM when the SIM memory is full.

Related 3GPP core specifications
TS 03.40, TS 11.11, TS 23.040, TS 31.102
Reason for test
To ensure that the user is notified when there is an attempt to store a message on the SIM when the SIM memory is full, and that the existing messages are not overwritten except on specific command from the user. To ensure that the MS is not able to receive further Class 2 SMs.

Initial configuration
Idle mode, no space available on the SIM for SMs.

Test procedure
1. Create a new MO-SM or use an already existing MT-SM and attempt to store it on the SIM. Check that the MS responds with a SIM memory full indication and does not overwrite an existing message in the SIM.
2. Send a Class 2 SMS to the MS. Verify that the MS is not able to receive the message and that it does not overwrite any existing message in the SIM.

Expected behaviour
1. The MS responds with a SIM memory full indication and does not overwrite an existing message in the SIM.
2. The message is not received. No existing messages in the SIM will be overwritten.

41.9.2 Store SM on the SIM; when SIM memory full (all messages unread)

Description
Attempt to store a message on the SIM when the SIM memory is full of unread MT-SMs.

Related GSM core specifications
GSM 03.40, GSM 11.11

Reason for test
To ensure that the user is notified when there is an attempt to store a message on the SIM when the SIM memory is full of unread MT-SMs, and that the existing messages are not overwritten except on specific command from the user.

Initial configuration
Idle mode, no space available on the SIM, SIM full of unread MT-SMs.

Test procedure
Create a new MO-SM and attempt to store it on the SIM. Check that the MS responds with a SIM memory full indication and does not overwrite an existing message in the SIM.

Expected behaviour
The MS responds with a SIM memory full indication and does not overwrite an existing message in the SIM.

41.9.3 Delete SM on the SIM

Description
Delete a message from the SIM.

Related 3GPP core specifications
TS 03.40, TS 11.11, TS 23.040, TS 31.102

Reason for test
To ensure that, when the SIM memory is full, the user can delete one or more stored messages from the SIM and subsequently store a new MO-SM on the SIM and receive a new Class 2 SM.

Initial configuration
Idle mode, no space available on the SIM for SMs.
Test procedure

1. Delete a SM from the SIM. Create a new MO-SM and store it on the SIM.
2. Delete the SM. Turn off the MS and turn it on again. Check that the SM is no longer stored.
3. Send a Class 2 SMS to the MS.

Expected behaviour

1. The SM is correctly stored on the SIM
2. The SM is no longer stored on the SIM after being deleted.
3. The SM is correctly received and stored on the SIM.

41.9.4 Store SM in the ME

Description

Store a message on the ME.

Related GSM core specifications

GSM 03.40, GSM 11.11

Reason for test

To ensure that a message can be stored into the ME, if supported by the terminal.

Initial configuration

Idle mode, space available into the ME.

Test procedure

Create a new MO-SM and store it into the ME. Check that it can be retrieved and edited and can be sent.

Expected behaviour

The MO-SM can be retrieved and edited and can be sent.

41.9.5 Store SM in the ME; when ME memory full

Description

Attempt to store a message on the ME when the ME memory and the SIM memory are full.

Related GSM core specifications

GSM 03.40, GSM 11.11

Reason for test

To ensure that the user is notified when there is an attempt to store a message on the ME when the ME memory is full, and that the existing messages are not overwritten except on specific command from the user.

Initial configuration

Idle mode, no space available in the ME neither in the SIM.

Test procedure

Create a new MO-SM and attempt to store it into the ME. Check that the MS responds with a memory full indication and does not store the message and does not overwrite an existing message in the SIM or in the ME.

Expected behaviour

The MS responds with a memory full indication, does not store the message and does not overwrite an existing message in the SIM or in the ME.
41.9.6 Store SM in the ME; when ME memory full (all messages unread)

**Description**
Attempt to store a message on the ME when the ME memory and the SIM memory are full of unread MT-SMs.

**Related GSM core specifications**
GSM 03.40, GSM 11.11

**Reason for test**
To ensure that the user is notified when there is an attempt to store a message on the ME when the ME memory is full of unread MT-SMs, and that the existing messages are not overwritten except on specific command from the user.

**Initial configuration**
Idle mode, no space available on the ME memory neither on the SIM memory.

**Test procedure**
Create a new MO-SM and attempt to store it on the ME. Check that the MS responds with a memory full indication and does not store the message and does not overwrite an existing message in the SIM or in the ME.

**Expected behaviour**
The MS responds with a memory full indication, does not store the message and does not overwrite an existing message in the SIM or in the ME.

41.9.7 Delete SM in the ME

**Description**
Delete a message from the ME.

**Related GSM core specifications**
GSM 03.40, GSM 11.11

**Reason for test**
To ensure that the user can delete a stored message from the ME instead of sending it.

**Initial configuration**
Idle mode.

**Test procedure**
Create a new MO-SM and store it on the ME. Then delete it. Turn off the MS and turn it on again. Check that the SM is no longer stored.

**Expected behaviour**
The SM is no longer stored after it is deleted.

41.10 Short message service cell broadcast

41.10.1 No short message CB, when presentation is turned off

**Description**
Ensure that SMS-CB messages are not displayed when SMS-CB presentation is turned off.

**Related GSM core specifications**
GSM 03.41, GSM 04.12

**Reason for test**
To ensure that SMS-CB messages are not displayed when SMS-CB presentation is turned off.
Initial configuration
Idle mode.

Test procedure
Using MMI commands, set the SMS-CB presentation to off. Compare with another MS which has SMS-CB display enabled, and check that when an SMS-CB message is received and displayed on the other MS, it is not displayed on the MS under test.

Expected behaviour
The SMS-CB is not displayed on the MS under test and is displayed on the other MS.

41.10.2 Short message CB after presentation is turned on

Description
Ensure that SMS-CB messages are displayed when SMS-CB presentation is turned on.

Related GSM core specifications
GSM 03.41, GSM 04.12

Reason for test
To ensure that SMS-CB messages are displayed when SMS-CB presentation is turned on.

Initial configuration
Idle mode.

Test procedure
Using MMI commands, set the SMS-CB presentation to on, select a proper channel (CBMI), select an appropriate language if needed. Check that when an SMS-CB message is received, it is displayed on the MS under test.

Expected behaviour
The SMS-CB is displayed on the MS.

41.10.3 Change short message CB channel list

Description
Ensure that the SMS-CB channel list can be changed.

Related GSM core specifications
GSM 03.41, GSM 04.12

Reason for test
To ensure that the SMS-CB channel list can be changed and that the messages displayed by the MS reflect the selection.

Initial configuration
Idle mode. SMS-CB presentation on

Test procedure
Using MMI commands, change the SMS-CB channel list. Check that an SMS-CB messages is only displayed in respect of the current channel list (e.g. by comparing the displayed messages with those on another MS configured differently.

Expected behaviour
Only the appropriate SMS-CB messages are displayed.
41.11 Text Alignment

41.11.1 MMI language is right aligned UCS2 language & Terminated / Originated SM is 7 bit default alphabetic (aligned to the left)

Description
Ensure that 7 bit default alphabetic SM is aligned correctly (e.g. English is aligned to the left) even when the UCS2 MMI language is aligned to the opposite direction (e.g. Hebrew is aligned to the right).

Related GSM core specifications
N.A.

Reason for test
To ensure that 7 bit default alphabetic SM is aligned correctly (e.g. English is aligned to the left) even when the UCS2 MMI language is aligned to the opposite direction (e.g. Hebrew is aligned to the right).

Initial configuration
Idle mode.

Test procedure
1. Using MMI commands, change MMI language to the right aligned UCS2 language (e.g. Hebrew). Use MMI commands to originate an SM in 7 bit default alphabetic. Check that the text is aligned to the left.
2. Using MMI commands, change MMI language to the right aligned UCS2 language (e.g. Hebrew). Arrange for an SMS 7 bit default (e.g. English) to be sent to your MS. Check that the terminated text is aligned to the left.

Expected behaviour
Originated 7 bit default alphabetic text will be aligned to the left. Terminated 7 bit default SM will be aligned to the left. All of that even when USC2 MMI language is aligned to the right.

41.11.2 MMI language is 7 bit default (Aligned to the left) & Terminated / Originated SM is in right aligned UCS2 language

Description
Ensure that UCS2 SM is aligned correctly (e.g. Hebrew is aligned to the right) even when MMI language is 7 bit default alphabetic is aligned to the opposite direction (e.g. English is aligned to the left).

Related GSM core specifications
N.A.

Reason for test
To ensure that UCS2 SM is aligned correctly (e.g. Hebrew is aligned to the right) even when MMI language is 7 bit default alphabetic is aligned to the opposite direction (e.g. English is aligned to the left).

Initial configuration
Idle mode.

Test procedure
1. Using MMI commands, change MMI language to 7 bit default alphabetic (aligned to the left). Use MMI commands to originate an SM with a right aligned UCS2 language content (e.g. Hebrew). Check that the text is indeed aligned to the right.
2. Using MMI commands, change MMI language to 7 bit default alphabetic (aligned to the left). Arrange for an SM with a right aligned UCS2 language content (e.g. Hebrew) to be sent to your MS. Check that the terminated text is indeed aligned to the right.
Expected behaviour

Originated SM in UCS2 alphabetic text that is supposed to be aligned to the right (e.g. Hebrew) will be aligned to the right. Terminated SM in UCS2 alphabetic text that is supposed to be aligned to the right will be aligned to the right. All of that even when 7 bit default MMI language is aligned to the left.

42 Supplementary services

42.1 Call Forwarding telephony, fax and data

NOTE: The tests of this supplementary service may be performed in any convenient order. To save time, it will be best to organise a testing order so that, in as many cases as possible, the initial configuration for one test is the same as the final configuration of the previous test. No attempt has been made to specify a particular order of tests in this document, as the optimum arrangement will depend on the features offered by the MS.

42.1.1 Call Forwarding Unconditional – Without Basic Service

Description

Call Forwarding Unconditional (CFU) will forward all calls.

Related 3GPP core specifications

TS 24.082 subclasses 1-4

Reason for test

Ensure that supplementary services works correctly on the network

Initial configuration

DUT in idle mode, supplementary service not registered

Test procedure

Scenario A: Code

1. Registration. Dial **21*DN#
2. Interrogation. Dial *#21#
3. Deactivation. Dial #21#
4. Interrogation. Dial *#21#
5. Activation. Dial *21#
6. Interrogation. Dial *#21#
7. Erasure. Dial ##21#
8. Interrogation. Dial *#21#

Scenario B: Menu

1. Registration. Register CFU without Basic Service via the menu.
2. Interrogation. Interrogate CFU without Basic Service via the menu.
3. Deactivation. Deactivate CFU without Basic Service via the menu.
4. Interrogation. Interrogate CFU without Basic Service via the menu.
5. Activation. Activate CFU without Basic Service via the menu.
6. Interrogation. Interrogate CFU without Basic Service via the menu.
7. Erasure. Erase CFU without Basic Service via the menu.
8. Interrogation. Interrogate CFU without Basic Service via the menu.
Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is erased
8. DUT displays a message to indicate the service is erased.

42.1.2 Call Forwarding when Busy – Without Basic Service

Description
Call Forwarding when Busy (CFB) will forward calls when the DUT is busy.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered

Test procedure

Scenario A: Code
1. Registration. Dial **67*DN#
2. Interrogation. Dial *#67#
3. Deactivation. Dial #67#
4. Interrogation. Dial *#67#
5. Activation. Dial *67#
6. Interrogation. Dial *#67#
7. Erasure. Dial ##67#
8. Interrogation. Dial *#67#

Scenario B: Menu
1. Registration. Register CFB without Basic Service via the menu.
2. Interrogation. Interrogate CFB without Basic Service via the menu.
3. Deactivation. Deactivate CFB without Basic Service via the menu.
4. Interrogation. Interrogate CFB without Basic Service via the menu.
5. Activation. Activate CFB without Basic Service via the menu.
6. Interrogation. Interrogate CFB without Basic Service via the menu.
7. Erasure. Erase CFB without Basic Service via the menu.
8. Interrogation. Interrogate CFB without Basic Service via the menu.

Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is erased
8. DUT displays a message to indicate the service is erased.

42.1.3 Call Forwarding No Reply – Without Basic Service

Description
Call Forwarding No Reply (CFN Ry) will forward calls when the DUT is not answered after a set length of time.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered
T – Timer value. Between 5-30 seconds in 5 second increments.

Test procedure
Scenario A: Code
1. Registration. Dial **61*DN**T#
2. Interrogation. Dial *#61#
3. Deactivation. Dial #61#
4. Interrogation. Dial *#61#
5. Activation. Dial *61#
6. Interrogation. Dial *#61#
7. Erasure. Dial ##61#
8. Interrogation. Dial *#61#
9. Different Timer Values. Repeat steps 1-8 with different Timer values.

Scenario B: Menu
1. Registration. Register CFNRY without Basic Service via the menu with setting of Ts.
2. Interrogation. Interrogate CFNRY without Basic Service via the menu.
3. Deactivation. Deactivate CFNRY without Basic Service via the menu.
4. Interrogation. Interrogate CFNRY without Basic Service via the menu.
5. Activation. Activate CFNRY without Basic Service via the menu.
6. Interrogation. Interrogate CFNRY without Basic Service via the menu.
7. Erasure. Erase CFNRY without Basic Service via the menu.
8. Interrogation. Interrogate CFNRY without Basic Service via the menu.
9. Different Timer Values. Repeat steps 1-8 with different Timer values.

Expected behaviour
1. DUT displays a message to indicate the service is registered for Ts
2. DUT displays a message to indicate the service is registered for Ts
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated for Ts
6. DUT displays a message to indicate the service is activated for Ts
7. DUT displays a message to indicate the service is erased
8. DUT displays a message to indicate the service is erased
9. DUT displays appropriate messages for the different timer values.

42.1.4 Call Forwarding Not Reachable – Without Basic Service

Description
Call Forwarding No Reply (CFNRc) will forward calls when the DUT is not reachable.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered.

Test procedure
Scenario A: Code
1. Registration. Dial **62*DN#
2. Interrogation. Dial *#62#
3. Deactivation. Dial #62#
4. Interrogation. Dial *#62#
5. Activation. Dial *62#
6. Interrogation. Dial *#62#
7. Erasure. Dial ##62#
8. Interrogation. Dial *#62#

Scenario B: Menu
1. Registration. Register CFNRC without Basic Service via the menu.
2. Interrogation. Interrogate CFNRC without Basic Service via the menu.
3. Deactivation. Deactivate CFNRC without Basic Service via the menu.
4. Interrogation. Interrogate CFNRC without Basic Service via the menu.
5. Activation. Activate CFNRC without Basic Service via the menu.
6. Interrogation. Interrogate CFNRC without Basic Service via the menu.
7. Erasure. Erase CFNRC without Basic Service via the menu.
8. Interrogation. Interrogate CFNRC without Basic Service via the menu.

Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is erased
8. DUT displays a message to indicate the service is erased.

42.1.5 All Conditional Call Forwarding – Without Basic Service

Description
All Conditional Call Forwarding (CCF) will forward calls when the DUT is Busy, not reachable and no Reply.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered

Test procedure
Scenario A: Code
1. Registration. Dial **004*DN#
2. Interrogation. Dial *#67#
3. Interrogation. Dial *#61#
4. Interrogation. Dial *#62#
5. Deactivation. Dial #004#
6. Interrogation. Dial *#67#
7. Interrogation. Dial *#61#
8. Interrogation. Dial *#62#
9. Activation. Dial *004#
10. Interrogation. Dial *#67#
11. Interrogation. Dial *#61#
12. Interrogation. Dial *#62#
13. Erasure. Dial ##004#
14. Interrogation. Dial *#67#
15. Interrogation. Dial *#61#
16. Interrogation. Dial *#62#

Scenario B: Menu
1. Registration. Register CCF without Basic Service via the menu.
2. Interrogation. Interrogate CFB without Basic Service via the menu.
3. Interrogation. Interrogate CFNRy without Basic Service via the menu.
4. Interrogation. Interrogate CFNRc without Basic Service via the menu.
5. Deactivation. Deactivate CCF without Basic Service via the menu.
6. Interrogation. Interrogate CFB without Basic Service via the menu.
7. Interrogation. Interrogate CFNRy without Basic Service via the menu.
8. Interrogation. Interrogate CFNRc without Basic Service via the menu.
10. Interrogation. Interrogate CFB without Basic Service via the menu.
11. Interrogation. Interrogate CFNRy without Basic Service via the menu.
12. Interrogation. Interrogate CFNRc without Basic Service via the menu.
15. Interrogation. Interrogate CFNRy without Basic Service via the menu.
16. Interrogation. Interrogate CFNRc without Basic Service via the menu.

**Expected behaviour**

1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is registered
4. DUT displays a message to indicate the service is registered
5. DUT displays a message to indicate the service is deactivated
6. DUT displays a message to indicate the service is deactivated
7. DUT displays a message to indicate the service is deactivated
8. DUT displays a message to indicate the service is deactivated
9. DUT displays a message to indicate the service is activated
10. DUT displays a message to indicate the service is activated
11. DUT displays a message to indicate the service is activated
12. DUT displays a message to indicate the service is activated
13. DUT displays a message to indicate the service is erased
14. DUT displays a message to indicate the service is erased
15. DUT displays a message to indicate the service is erased
16. DUT displays a message to indicate the service is erased.

**42.1.6 All Call Forwarding – Without Basic Service**

**Description**

All Call Forwarding (CF) will forward All Calls.

**Related 3GPP core specifications**

TS 24.082 subclasses 1-4

**Reason for test**

Ensure that supplementary services works correctly on the network.

**Initial configuration**

DUT in idle mode, supplementary service not registered

**Test procedure**

**Scenario A: Code**

1. Registration. Dial **002*DN#
2. Interrogation. Dial *#21#
3. Interrogation. Dial *#67#
4. Interrogation. Dial *#61#
5. Interrogation. Dial *#62#
6. Deactivation. Dial #002#
7. Interrogation. Dial *#21#
8. Interrogation. Dial *#67#
9. Interrogation. Dial *#61#
10. Interrogation. Dial *#62#
11. Activation. Dial *002#
12. Interrogation. Dial *#21#
13. Interrogation. Dial *#67#
14. Interrogation. Dial *#61#
15. Interrogation. Dial *#62#
16. Erasure. Dial ##002#
17. Interrogation. Dial *#21#
18. Interrogation. Dial *#67#
19. Interrogation. Dial *#61#
20. Interrogation. Dial *#62#

Scenario B: Menu
1. Registration. Register CF without Basic Service via the menu.
2. Interrogation. Interrogate CFU without Basic Service via the menu.
3. Interrogation. Interrogate CFB without Basic Service via the menu.
4. Interrogation. Interrogate CFNRy without Basic Service via the menu.
5. Interrogation. Interrogate CFNRc without Basic Service via the menu.
6. Deactivation. Deactivate CF without Basic Service via the menu.
7. Interrogation. Interrogate CFU without Basic Service via the menu.
8. Interrogation. Interrogate CFB without Basic Service via the menu.
9. Interrogation. Interrogate CFNRy without Basic Service via the menu.
10. Interrogation. Interrogate CFNRc without Basic Service via the menu.
11. Activation. Activate CF without Basic Service via the menu.
12. Interrogation. Interrogate CFU without Basic Service via the menu.
13. Interrogation. Interrogate CFB without Basic Service via the menu.
15. Interrogation. Interrogate CFNRc without Basic Service via the menu.
17. Interrogation. Interrogate CFU without Basic Service via the menu.
18. Interrogation. Interrogate CFB without Basic Service via the menu.
19. Interrogation. Interrogate CFNRy without Basic Service via the menu.
20. Interrogation. Interrogate CFNRc without Basic Service via the menu.
Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is registered
4. DUT displays a message to indicate the service is registered
5. DUT displays a message to indicate the service is registered
6. DUT displays a message to indicate the service is deactivated
7. DUT displays a message to indicate the service is deactivated
8. DUT displays a message to indicate the service is deactivated
9. DUT displays a message to indicate the service is deactivated
10. DUT displays a message to indicate the service is deactivated
11. DUT displays a message to indicate the service is activated
12. DUT displays a message to indicate the service is activated
13. DUT displays a message to indicate the service is activated
14. DUT displays a message to indicate the service is activated
15. DUT displays a message to indicate the service is activated
16. DUT displays a message to indicate the service is erased
17. DUT displays a message to indicate the service is erased
18. DUT displays a message to indicate the service is erased
19. DUT displays a message to indicate the service is erased
20. DUT displays a message to indicate the service is erased.

42.1.7 Call Forwarding Unconditional – With Basic Service

Description
Call Forwarding Unconditional (CFU) will forward all calls.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services work correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered.

BS – Basic Service: 11 – Voice, 13 – FAX, 24 – Video, 25 – Data

Test procedure
Scenario A: Code
1. Registration. Dial **21*DN*BS#
2. Interrogation. Dial *#21**BS#
3. Deactivation. Dial #21**BS#
4. Interrogation. Dial *#21**BS#
5. Activation. Dial *21**BS#
6. Interrogation. Dial *#21**BS#
7. Erasure. Dial ##21**BS#
8. Interrogation. Dial *#21**BS#
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network.

**Scenario B: Menu**
1. Registration. Register CFU with Basic Service via the menu.
2. Interrogation. Interrogate CFU with Basic Service via the menu.
3. Deactivation. Deactivate CFU with Basic Service via the menu.
4. Interrogation. Interrogate CFU with Basic Service via the menu.
5. Activation. Activate CFU with Basic Service via the menu.
6. Interrogation. Interrogate CFU with Basic Service via the menu.
7. Erasure. Erase CFU with Basic Service via the menu.
8. Interrogation. Interrogate CFU with Basic Service via the menu.
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network and the DUT.

**Expected behaviour**
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is not registered
8. DUT displays a message to indicate the service is not registered
9. DUT displays messages appropriately for different BS.

**42.1.8 Call Forwarding when Busy – With Basic Service**

**Description**
Call Forwarding when Busy (CFB) will forward calls when the DUT is busy.

**Related 3GPP core specifications**
TS 24.082 subclasses 1-4

**Reason for test**
Ensure that supplementary services works correctly on the network.

**Initial configuration**
DUT in idle mode, supplementary service not registered.

BS – Basic Service: 11 – Voice, 13 – FAX, 24 – Video, 25 - Data

**Test procedure**

**Scenario A: Code**
1. Registration. Dial **67*DN*BS#*
2. Interrogation. Dial *#67**BS#*
3. Deactivation. Dial #67**BS#*
4. Interrogation. Dial *#67**BS#*
5. Activation. Dial *67**BS#*
6. Interrogation. Dial *#67**BS#*
7. Erasure. Dial ##67**BS#
8. Interrogation. Dial *#67**BS#
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network.

Scenario B: Menu
1. Registration. Register CFB with Basic Service via the menu.
2. Interrogation. Interrogate CFB with Basic Service via the menu.
3. Deactivation. Deactivate CFB with Basic Service via the menu.
4. Interrogation. Interrogate CFB with Basic Service via the menu.
5. Activation. Activate CFB with Basic Service via the menu.
6. Interrogation. Interrogate CFB with Basic Service via the menu.
7. Erasure. Erase CFB with Basic Service via the menu.
8. Interrogation. Interrogate CFB with Basic Service via the menu.
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network and the DUT.

Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is not registered
8. DUT displays a message to indicate the service is not registered
9. DUT displays messages appropriately for different BS.

42.1.9 Call Forwarding No Reply – With Basic Service

Description
Call Forwarding No Reply (CFNRy) will forward calls when the DUT is not answered after a set length of time.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered.
T – Timer value. Between 5-30 seconds in 5 second increments.

Test procedure
Scenario A: Code
1. Registration. Dial **61*DN*BS*T#
2. Interrogation. Dial *#61**BS#
3. Deactivation. Dial #61**BS#
4. Interrogation. Dial *#61**BS#
5. Activation. Dial *61**BS#
6. Interrogation. Dial *#61**BS#
7. Erasure. Dial ##61**BS#
8. Interrogation. Dial *#61**BS#
9. Different Timer Values. Repeat steps 1-8 with different Timer values
10. Different BS. Repeat steps 1-9 for up to 3 different BS if supported by the network.

Scenario B: Menu
1. Registration. Register CFNRY with Basic Service via the menu with setting of Ts.
2. Interrogation. Interrogate CFNRY with Basic Service via the menu.
3. Deactivation. Deactivate CFNRY with Basic Service via the menu.
4. Interrogation. Interrogate CFNRY with Basic Service via the menu.
5. Activation. Activate CFNRY with Basic Service via the menu.
6. Interrogation. Interrogate CFNRY with Basic Service via the menu.
7. Erasure. Erase CFNRY with Basic Service via the menu.
8. Interrogation. Interrogate CFNRY with Basic Service via the menu.
9. Different Timer Values. Repeat steps 1-8 with different Timer values.
10. Different BS. Repeat steps 1-9 for up to 3 different BS if supported by the network and the DUT.

Expected behaviour
1. DUT displays a message to indicate the service is registered for Ts
2. DUT displays a message to indicate the service is registered for Ts
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated for Ts
6. DUT displays a message to indicate the service is activated for Ts
7. DUT displays a message to indicate the service is not registered
8. DUT displays a message to indicate the service is not registered
9. DUT displays messages appropriately for the different timer values
10. DUT displays messages appropriately for different BS.

42.1.10 Call Forwarding Not Reachable – With Basic Service

Description
Call Forwarding No Reply (CFNRc) will forward calls when the DUT is not reachable.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered.

Test procedure

Scenario A: Code
1. Registration. Dial **62*DN*BS#
2. Interrogation. Dial *#62**BS#
3. Deactivation. Dial #62**BS#
4. Interrogation. Dial *#62**BS#
5. Activation. Dial *62**BS#
6. Interrogation. Dial *#62**BS#
7. Erasure. Dial ##62**BS#
8. Interrogation. Dial *#62**BS#
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network.

Scenario B: Menu
1. Registration. Register CFNRC with Basic Service via the menu.
2. Interrogation. Interrogate CFNRC with Basic Service via the menu.
3. Deactivation. Deactivate CFNRC with Basic Service via the menu.
4. Interrogation. Interrogate CFNRC with Basic Service via the menu.
5. Activation. Activate CFNRC with Basic Service via the menu.
6. Interrogation. Interrogate CFNRC with Basic Service via the menu.
7. Erasure. Erase CFNRC with Basic Service via the menu.
8. Interrogation. Interrogate CFNRC with Basic Service via the menu.
9. Different BS. Repeat steps 1-8 for up to 3 different BS if supported by the network and the DUT.

Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is deactivated
4. DUT displays a message to indicate the service is deactivated
5. DUT displays a message to indicate the service is activated
6. DUT displays a message to indicate the service is activated
7. DUT displays a message to indicate the service is not registered
8. DUT displays a message to indicate the service is not registered
9. DUT displays messages appropriately for different BS.

42.1.11 All Conditional Call Forwarding – With Basic Service

Description
All Conditional Call Forwarding (CCF) will forward calls when the DUT is Busy, not reachable and no Reply.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.
Initial configuration
DUT in idle mode, supplementary service not registered.


Test procedure

Scenario A: Code
1. Registration. Dial **004*DN*BS#
2. Interrogation. Dial *#67**BS#
3. Interrogation. Dial *#61**BS#
4. Interrogation. Dial *#62**BS#
5. Deactivation. Dial #004**BS#
6. Interrogation. Dial *#67**BS#
7. Interrogation. Dial *#61**BS#
8. Interrogation. Dial *#62**BS#
9. Activation. Dial *004**BS#
10. Interrogation. Dial *#67**BS#
11. Interrogation. Dial *#61**BS#
12. Interrogation. Dial *#62**BS#
13. Erasure. Dial ##004**BS#
14. Interrogation. Dial *#67**BS#
15. Interrogation. Dial *#61**BS#
16. Interrogation. Dial *#62**BS#
17. Different BS. Repeat steps 1-16 for up to 3 different BS if supported by the network.

Scenario B: Menu
1. Registration. Register CCF via the menu.
2. Interrogation. Interrogate CFB via the menu.
3. Interrogation. Interrogate CFNRy via the menu.
4. Interrogation. Interrogate CFNRc via the menu.
5. Deactivation. Deactivate CCF via the menu.
6. Interrogation. Interrogate CFB via the menu.
7. Interrogation. Interrogate CFNRy via the menu.
8. Interrogation. Interrogate CFNRc via the menu.
10. Interrogation. Interrogate CFB via the menu.
11. Interrogation. Interrogate CFNRy via the menu.
12. Interrogation. Interrogate CFNRc via the menu.
15. Interrogation. Interrogate CFNRy via the menu.
16. Interrogation. Interrogate CFNRc via the menu.
17. Different BS. Repeat steps 1-16 for up to 3 different BS if supported by the network and the DUT.
Expected behaviour
1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is registered
4. DUT displays a message to indicate the service is registered
5. DUT displays a message to indicate the service is deactivated
6. DUT displays a message to indicate the service is deactivated
7. DUT displays a message to indicate the service is deactivated
8. DUT displays a message to indicate the service is deactivated
9. DUT displays a message to indicate the service is activated
10. DUT displays a message to indicate the service is activated
11. DUT displays a message to indicate the service is activated
12. DUT displays a message to indicate the service is activated
13. DUT displays a message to indicate the service is erased
14. DUT displays a message to indicate the service is erased
15. DUT displays a message to indicate the service is erased
16. DUT displays a message to indicate the service is erased
17. DUT displays messages appropriately for different BS.

42.1.12 All Call Forwarding – With Basic Service

Description
All Call Forwarding (CF) will forward All Calls.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that supplementary services works correctly on the network.

Initial configuration
DUT in idle mode, supplementary service not registered.


Test procedure
Scenario A: Code
1. Registration. Dial **002*DN*BS#
2. Interrogation. Dial *#21**BS#
3. Interrogation. Dial *#67**BS#
4. Interrogation. Dial *#61**BS#
5. Interrogation. Dial *#62**BS#
6. Deactivation. Dial #002**BS#
7. Interrogation. Dial *#21**BS#
8. Interrogation. Dial *#67**BS#
9. Interrogation. Dial *#61**BS#
10. Interrogation. Dial *#62**BS#
11. Activation. Dial *002**BS#
12. Interrogation. Dial *#21**BS#
13. Interrogation. Dial *#67**BS#
14. Interrogation. Dial *#61**BS#
15. Interrogation. Dial *#62**BS#
16. Erasure. Dial ##002**BS#
17. Interrogation. Dial *#21**BS#
18. Interrogation. Dial *#67**BS#
19. Interrogation. Dial *#61**BS#
20. Interrogation. Dial *#62**BS#
21. Different BS. Repeat steps 1-20 for up to 3 different BS if supported by the network.

**Scenario B: Menu**

1. Registration. Register CF via the menu.
2. Interrogation. Interrogate CFU via the menu.
3. Interrogation. Interrogate CFB via the menu.
4. Interrogation. Interrogate CFNRy via the menu.
5. Interrogation. Interrogate CFNRc via the menu.
6. Deactivation. Deactivate CF via the menu.
7. Interrogation. Interrogate CFU via the menu.
8. Interrogation. Interrogate CFB via the menu.
9. Interrogation. Interrogate CFNRy via the menu.
10. Interrogation. Interrogate CFNRc via the menu.
11. Activation. Activate CF via the menu.
12. Interrogation. Interrogate CFU via the menu.
13. Interrogation. Interrogate CFB via the menu.
15. Interrogation. Interrogate CFNRc via the menu.
17. Interrogation. Interrogate CFU via the menu.
18. Interrogation. Interrogate CFB via the menu.
19. Interrogation. Interrogate CFNRy via the menu.
20. Interrogation. Interrogate CFNRc via the menu.
21. Different BS. Repeat steps 1-20 for up to 3 different BS if supported by the network and the DUT.

**Expected behaviour**

1. DUT displays a message to indicate the service is registered
2. DUT displays a message to indicate the service is registered
3. DUT displays a message to indicate the service is registered
4. DUT displays a message to indicate the service is registered
5. DUT displays a message to indicate the service is registered
6. DUT displays a message to indicate the service is deactivated
7. DUT displays a message to indicate the service is deactivated
8. DUT displays a message to indicate the service is deactivated
9. DUT displays a message to indicate the service is deactivated
10. DUT displays a message to indicate the service is deactivated
11. DUT displays a message to indicate the service is activated
12. DUT displays a message to indicate the service is activated
13. DUT displays a message to indicate the service is activated
14. DUT displays a message to indicate the service is activated
15. DUT displays a message to indicate the service is activated
16. DUT displays a message to indicate the service is erased
17. DUT displays a message to indicate the service is erased
18. DUT displays a message to indicate the service is erased
19. DUT displays a message to indicate the service is erased
20. DUT displays a message to indicate the service is erased
21. DUT displays messages appropriately for different BS.

42.1.13 Display message of registered and activated call forwarding during MOC setup

Description
Display an indication of Call Forwarding status when making an MO call.

Related 3GPP core specifications
TS 24.082 subclasses 1-4

Reason for test
Ensure that the Call Forwarding status of the DUT is displayed correctly to the user during or after call setup of an MO Call.

Initial configuration
Network support for “NotifySS” message.

DUT in idle mode.

Test scenarios (overview)

Scenario A: Voice Call
Scenario B: Video Call

The below test procedure is applicable to all scenarios.

Test procedure
1. Registration. Dial **004*DN#
2. Establish call according to the scenario listed above.
3. Erasure. Dial ##004#
4. Registration. Dial **21*DN#
5. Establish call according to the scenario listed above.
6. Erasure. Dial ##21#.

Expected behaviour
1. DUT displays a message to indicate the service is registered.
2. Check that a SS notification e.g. “Conditional Forwarding Active” is correctly displayed during MO Call setup and the call is established correctly. In case the DUT does not support call forwarding notifications during MOC setup, verify that the call is set up without any disturbance.

3. DUT displays a message to indicate the service is Erased.

4. DUT displays a message to indicate the service is registered.

5. Check that a SS notification e.g. “Unconditional Forwarding Active” is correctly displayed during MO Call setup and the call is established correctly. In case the DUT does not support call forwarding notifications during MOC setup, verify that the call is set up without any disturbance.

6. DUT displays a message to indicate the service is Erased.

42.2 Call Barring telephony, SMS, fax and data

42.2.1 Bar All Outgoing Calls (BAOC) – Without Basic Service

Description
Barring All Outgoing Calls (BAOC) will bar all outgoing calls.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Outgoing Calls (BAOC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.

PW – Password. This is the current Call Barring Password.

DUT is in its HPLMN

Client 1 – Same International dialling prefix as DUT.

Test procedure

Scenario A: Code
1. Activation. Dial *33*PW#
2. Interrogation. Dial *#33#
3. Make MO voice call to Client 1.
4. Deactivation. Dial #33*PW#
5. Interrogation. Dial *#33#

Scenario B: Menu
1. Activation. Activate BAOC without Basic Service via the menu.
2. Interrogation. Interrogate BAOC without Basic Service via the menu.
3. Make MO voice call to Client 1.
4. Deactivation. Deactivate BAOC without Basic Service via the menu.
5. Interrogation. Interrogate BAOC without Basic Service via the menu.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO voice call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO voice call is successful.

42.2.2 Bar Outgoing International Calls (BOIC) – Without Basic Service

Description
Barring Outgoing International Calls (BOIC) will bar all calls to all numbers with a different International dialling prefix.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring Outgoing International Calls (BOIC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.

PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Different International dialling prefix to DUT.

Test procedure

Scenario A: Code
1. Activation. Dial *331*PW#
2. Interrogation. Dial *331#
3. Make MO voice call to Client 1.
4. Deactivation. Dial #331*PW#
5. Interrogation. Dial *331#

Scenario B: Menu
1. Activation. Activate BOIC without Basic Service via the menu.
2. Interrogation. Interrogate BOIC without Basic Service via the menu.
3. Make MO voice call to Client 1.
4. Deactivation. Deactivate BOIC without Basic Service via the menu.
5. Interrogation. Interrogate BOIC without Basic Service via the menu.
6. Make MO voice call to Client 1

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO voice call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO voice call is successful.
42.2.3 Bar Outgoing International Calls except Home Country (BOIC-exHC) – Without Basic Service

Description
Barring Outgoing International Calls except Home Country (BOIC-exHC) will bar all calls to all numbers with a different International dialling prefix except to International numbers that are local to the network the DUT is roaming in.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring Outgoing International Calls (BOIC-exHC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT – DUT is roaming outside of HPLMN.
Client 1 – Different International dialling prefix to DUT and the country the DUT is roaming in.

Test procedure
Scenario A: Code
1. Activation. Dial *332*PW#
2. Interrogation. Dial *#332#
3. Make MO voice call to Client 1
4. Deactivation. Dial #332*PW#
5. Interrogation. Dial *#332#
6. Make MO voice call to Client 1

Scenario B: Menu
1. Activation. Activate BOIC-exHC without Basic Service via the menu.
2. Interrogation. Interrogate BOIC-exHC without Basic Service via the menu.
3. Make MO voice call to Client 1
4. Deactivation. Deactivate BOIC-exHC without Basic Service via the menu.
5. Interrogation. Interrogate BOIC-exHC without Basic Service via the menu.
6. Make MO voice call to Client 1

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO voice call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO voice call is successful.

42.2.4 Bar All Incoming Calls (BAIC) – Without Basic Service

Description
Barring All Incoming Calls (BAIC) will bar all Incoming calls.
Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Incoming Calls (BAIC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Same International dialling prefix as DUT.

Test procedure
Scenario A: Code
1. Activation. Dial *35*PW#
2. Interrogation. Dial *#35#
3. Receive MT voice call from Client 1.
4. Deactivation. Dial #35*PW#
5. Interrogation. Dial *#35#
6. Receive MT voice call from Client 1.

Scenario B: Menu
1. Activation. Activate BAIC without Basic Service via the menu.
2. Interrogation. Interrogate BAIC without Basic Service via the menu.
3. Receive MT voice call from Client 1.
4. Deactivation. Deactivate BAIC without Basic Service via the menu.
5. Interrogation. Interrogate BAIC without Basic Service via the menu.
6. Receive MT voice call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MT voice call is not received.
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MT voice call is successful.

42.2.5 Bar All Incoming Calls when Roaming (BAIC-R) – Without Basic Service

Description
Barring All Incoming Calls when Roaming (BAIC-R) will bar all incoming calls when Roaming outside of HPLMN.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Incoming Calls when Roaming (BAIC-R) works correctly.
Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT – DUT is roaming outside of HPLMN.
Client 1 – Same International dialling prefix as DUT.

Test procedure

Scenario A: Code
1. Activation. Dial *351*PW#
2. Interrogation. Dial *#351#
3. Receive MT voice call from Client 1.
4. Deactivation. Dial #351*PW#
5. Interrogation. Dial *#351#
6. Receive MT voice call from Client 1.

Scenario B: Menu
1. Activation. Activate BAIC-R without Basic Service via the menu.
2. Interrogation. Interrogate BAIC-R without Basic Service via the menu.
3. Receive MT voice call from Client 1.
4. Deactivation. Deactivate BAIC-R without Basic Service via the menu.
5. Interrogation. Interrogate BAIC-R without Basic Service via the menu.
6. Receive MT voice call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MT voice call is not received.
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MT voice call is successful.

42.2.6 Bar All Outgoing Calls (BAOC) – With Basic Service

Description
Barring All Outgoing Calls (BAOC) will bar all outgoing calls.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Outgoing Calls (BAOC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Same International dialling prefix as DUT.
Test procedure

Scenario A: Code
1. Activation. Dial *33*PW*BS#
2. Interrogation. Dial *#33#
3. Make MO BS call to Client 1.
4. Deactivation. Dial #33*PW*BS#
5. Interrogation. Dial *#33#
6. Make MO BS call to Client 1.

Scenario B: Menu
1. Activation. Activate BAOC With Basic Service via the menu.
2. Interrogation. Interrogate BAOC With Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Deactivation. Deactivate BAOC With Basic Service via the menu.
5. Interrogation. Interrogate BAOC With Basic Service via the menu.
6. Make MO BS call to Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call is successful.

42.2.7 Bar Outgoing International Calls (BOIC) – With Basic Service

Description
Barring Outgoing International Calls (BOIC) will bar all calls to all numbers with a different International dialling prefix.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring Outgoing International Calls (BOIC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Different International dialling prefix to DUT.

Test procedure
Scenario A: Code
1. Activation. Dial *331*PW*BS#
2. Interrogation. Dial *#331#
3. Make MO BS call to Client 1.
4. Deactivation. Dial #331*PW*BS#
5. Interrogation. Dial *#331#
6. Make MO BS call to Client 1.

Scenario B: Menu
1. Activation. Activate BOIC With Basic Service via the menu.
2. Interrogation. Interrogate BOIC With Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Deactivation. Deactivate BOIC With Basic Service via the menu.
5. Interrogation. Interrogate BOIC With Basic Service via the menu.
6. Make MO BS call to Client 1

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call is successful.

42.2.8 Bar Outgoing International Calls except Home Calls (BOIC-exHC) – With Basic Service

Description
Barring Outgoing International Calls except Home Calls (BOIC-exHC) will bar all calls to all numbers with a different International dialling prefix except to International numbers that are local to the network the DUT is roaming in.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring Outgoing International Calls (BOIC-exHC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT – DUT is roaming outside of HPLMN.
Client 1 – Different International dialling prefix to DUT and the country the DUT is roaming in.

Test procedure
Scenario A: Code
1. Activation. Dial *332*PW*BS#
2. Interrogation. Dial *#332#
3. Make MO BS call to Client 1
4. Deactivation. Dial #332*PW*BS#
5. Interrogation. Dial *#332#
6. Make MO BS call to Client 1

Scenario B: Menu
1. Activation. Activate BOIC-exHC With Basic Service via the menu.
2. Interrogation. Interrogate BOIC-exHC With Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Deactivation. Deactivate BOIC-exHC With Basic Service via the menu.
5. Interrogation. Interrogate BOIC-exHC With Basic Service via the menu.
6. Make MO BS call to Client 1

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call is successful.

42.2.9 Bar All Incoming Calls (BAIC) – With Basic Service

Description
Barring All Incoming Calls (BAIC) will bar all Incoming calls.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Incoming Calls (BAIC) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Same International dialling prefix as DUT.

Test procedure
Scenario A: Code
1. Activation. Dial *35*PW*BS#
2. Interrogation. Dial *#35#
3. Receive MT BS call from Client 1.
4. Deactivation. Dial #35*PW*BS#
5. Interrogation. Dial *#35#
6. Receive MT BS call from Client 1.
Scenario B: Menu
1. Activation. Activate BAIC With Basic Service via the menu.
2. Interrogation. Interrogate BAIC With Basic Service via the menu.
3. Receive MT BS call from Client 1.
4. Deactivation. Deactivate BAIC With Basic Service via the menu.
5. Interrogation. Interrogate BAIC With Basic Service via the menu.
6. Receive MT BS call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MT BS call is not received.
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MT BS call is successful.

42.2.10 Bar All Incoming Calls when Roaming (BAIC-R) – With Basic Service

Description
Barring All Incoming Calls when Roaming (BAIC-R) will bar all Incoming calls when Roaming outside of HPLMN.

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that call barring service for Barring All Incoming Calls when Roaming (BAIC-R) works correctly.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT – DUT is roaming outside of HPLMN.
Client 1 – Same International dialling prefix as DUT.

Test procedure
Scenario A: Code
1. Activation. Dial *351*PW*BS#
2. Interrogation. Dial */351#*
3. Receive MT BS call from Client 1.
4. Deactivation. Dial */351*BS#
5. Interrogation. Dial */351#
6. Receive MT BS call from Client 1.

Scenario B: Menu
1. Activation. Activate BAIC-R With Basic Service via the menu.
2. Interrogation. Interrogate BAIC-R With Basic Service via the menu.
3. Receive MT BS call from Client 1.
4. Deactivation. Deactivate BAIC-R With Basic Service via the menu.
5. Interrogation. Interrogate BAIC-R With Basic Service via the menu.
6. Receive MT BS call from Client 1.

**Expected behaviour**
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MT BS call is not received.
4. DUT displays a message to indicate the service is deactivated.
5. DUT displays a message to indicate the service is deactivated.
6. MT BS call is successful.

### 42.2.11 Call Barring activation – SIM without Call Barring services

**Description**
Activation of Call Barring services when a SIM card does not support the service should fail.

**Related GSM core specifications**
TS 24.088 sub clause 1.2

**Reason for test**
When a SIM card does not support Call Barring function, the DUT should indicate the activation request has failed.

**Initial configuration**
DUT in idle mode with no barring services Activated.

**Test procedure**

**Scenario A: Code**
1. Activation. Dial *33*PW#
2. Activation. Dial *331*PW#
3. Activation. Dial *332*PW#
4. Activation. Dial *35*PW#
5. Activation. Dial *351*PW*BS#

**Scenario B: Menu**
1. Activation. Activate BAOC without Basic Service via the menu.
2. Activation. Activate BOIC without Basic Service via the menu.
3. Activation. Activate BOIC-exHC without Basic Service via the menu.
4. Activation. Activate BAIC without Basic Service via the menu.
5. Activation. Activate BAIC-R without Basic Service via the menu.

**Expected behaviour**
1. DUT displays a message to indicate the Activation attempt has failed.
2. DUT displays a message to indicate the Activation attempt has failed.
3. DUT displays a message to indicate the Activation attempt has failed.
4. DUT displays a message to indicate the Activation attempt has failed.
5. DUT displays a message to indicate the Activation attempt has failed.

42.2.12 General Deactivation of Barring Services

42.2.12.1 General Deactivation of Barring Services – All Services

Description
Deactivation of all currently activated barring services

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that all call barring can be properly deactivated at once

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN
Client 1 – Same International dialling prefix as DUT.

Test procedure

Scenario A: Code
1. Activation. Dial *33*PW#
2. Activation. Dial *35*PW#
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Dial #330*PW#
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Scenario B: Menu
1. Activation. Activate BAOC without Basic Service via the menu.
2. Activation. Activate BAIC without Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Deactivate All Call Barring services via the menu.
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. MT BS call is not received.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call is successful.
7. MT BS call is successful.

42.2.12.2 General Deactivation of Barring Services – All Outgoing

Description
Deactivation of all currently activated Outgoing barring services

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that all call barring for Outgoing services can be properly deactivated at once.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN

Test procedure

Scenario A: Code
1. Activation. Dial *33*PW#
2. Activation. Dial *35*PW#
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Dial #333*PW#
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Scenario B: Menu
1. Activation. Activate BAOC without Basic Service via the menu.
2. Activation. Activate BAIC without Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Deactivate All Outgoing Call Barring services via the menu.
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. MT BS call is not received.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call is successful.
7. MT BS call is not received.
42.2.12.3 General Deactivation of Barring Services – All Incoming

Description
Deactivation of all currently activated Incoming barring services

Related GSM core specifications
TS 24.088 sub clause 1.2

Reason for test
Ensure that all call barring for Incoming services can be properly deactivated at once.

Initial configuration
DUT in idle mode with no barring services Activated.
PW – Password. This is the current Call Barring Password.
DUT is in its HPLMN

Test procedure

Scenario A: Code
1. Activation. Dial *33*PW#
2. Activation. Dial *35*PW#
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Dial #353*PW#
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Scenario B: Menu
1. Activation. Activate BAOC without Basic Service via the menu.
2. Activation. Activate BAIC without Basic Service via the menu.
3. Make MO BS call to Client 1.
4. Receive MT BS call from Client 1.
5. Deactivation. Deactivate All Incoming Call Barring services via the menu.
6. Make MO BS call to Client 1.
7. Receive MT BS call from Client 1.

Expected behaviour
1. DUT displays a message to indicate the service is Activated.
2. DUT displays a message to indicate the service is Activated.
3. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
4. MT BS call is not received.
5. DUT displays a message to indicate the service is deactivated.
6. MO BS call fails and DUT displays a message to indicate the call is barred. (Indication depends on release cause sent by network).
7. MT BS call is successful.
42.2.13  Change of Barring Password

42.2.13.1  Change of Password

Description
Change of Call Barring Password

Related GSM core specifications
TS 24.010 sub clause 4.2

Reason for test
Ensure that the user is able to change the barring password

Initial configuration
DUT in idle mode with no barring services Activated.
OLD – This is the current Call Barring Password.
NEW – This is the new Call Barring Password.

Test procedure

Scenario A: Code
1. Change. Dial *03**OLD*NEW*NEW#
2. Change. Dial **03**OLD*NEW*NEW#
3. Change. Dial *03*330*OLD*NEW*NEW#

Scenario B: Menu
1. Change. Change the Call Barring password via the menu.

Expected behaviour
1. DUT displays a response indicating that the password has been changed.
2. DUT displays a response indicating that the password has been changed.
3. DUT displays a response indicating that the password has been changed.

42.2.13.2  Change of Password, old Password wrong

Description
Failure of call barring password change caused by wrong old password

Related GSM core specifications
TS 24.010 sub clause 4.2

Reason for test
Ensure that the barring password is not changed if an incorrect old password is entered

Initial configuration
DUT in idle mode with no barring services Activated.
WRONG – This is not the current Call Barring Password.
NEW – This is the new Call Barring Password.

Test procedure

Scenario A: Code
1. Change. Dial *03**WRONG*NEW*NEW#
2. Change. Dial **03**WRONG*NEW*NEW#
3. Change. Dial *03*330*WRONG*NEW*NEW#
Scenario B: Menu
1. Change. Attempt to change the Call Barring password via the menu with WRONG password.

**Expected behaviour**
1. DUT displays a response indicating the old password is incorrect.
2. DUT displays a response indicating the old password is incorrect.
3. DUT displays a response indicating the old password is incorrect.

### 42.2.13.3 Change of Password, wrong repeating of new password

**Description**
Failure of call barring password change caused by wrong repetition of new password

**Related GSM core specifications**
TS 24.010 sub clause 4.2

**Reason for test**
Ensure that the barring password is not changed if the new password is repeated incorrectly

**Initial configuration**
DUT in idle mode with no barring services Activated.
OLD – This is the current Call Barring Password.
NEW1 – This is the new Call Barring Password.
NEW2 – This is a different Call Barring Password to that of NEW1.

**Test procedure**

**Scenario A: Code**
1. Change. Dial *03**OLD*NEW1*NEW2#
2. Change. Dial **03**OLD*NEW1*NEW2#
3. Change. Dial *03*330*OLD*NEW1*NEW2#

**Scenario B: Menu**
1. Change. Attempt to change the Call Barring password via the menu with NEW1 and NEW2.

**Expected behaviour**
1. DUT displays a response indicating that the new password has not been verified.
2. DUT displays a response indicating that the new password has not been verified.
3. DUT displays a response indicating that the new password has not been verified.

### 42.2.13.4 Change of Password, new password wrong (3 digits long)

**Description**
Failure of call barring password change caused by the new password being too short

**Related GSM core specifications**
TS 24.010 sub clause 4.2

**Reason for test**
Ensure that the barring password is not changed if the new password is only 3 digits long

**Initial configuration**
DUT in idle mode with no barring services Activated.
OLD – This is the current Call Barring Password.
SHORT – This is the new Call Barring Password that is 3 digits long.

Test procedure

Scenario A: Code
1. Change. Dial *03**OLD*SHORT*SHORT#
2. Change. Dial **03**OLD*SHORT*SHORT#
3. Change. Dial *03*330*OLD*SHORT*SHORT#

Scenario B: Menu
1. Change. Attempt to change the Call Barring password via the menu with SHORT password.

Expected behaviour
1. DUT displays a response indicating that the new password has not been verified.
2. DUT displays a response indicating that the new password has not been verified.
3. DUT displays a response indicating that the new password has not been verified.

42.3 Call Waiting / Call Hold

42.3.1 Call Waiting – without Basic Service

Description
Call Waiting service should inform a user that a second incoming call is waiting.

Related GSM core specifications
TS 24.083 clause 1.4

Reason for test
Ensure Call Waiting is working correctly.

Initial configuration
DUT in idle mode.
Call Waiting not activated on DUT.

Test procedure

Scenario A: Code
1. Activation. Dial *43#
2. Interrogation. Dial *#43#
3. Deactivation. Dial #43#
4. Interrogation. Dial *#43#

Scenario B: Menu
1. Activation. Activate Call Waiting without Basic Service via the menu.
2. Interrogation. Interrogate Call Waiting without basic Service via the menu.
3. Deactivation. Deactivate Call Waiting without Basic Service via the menu.
4. Interrogation. Interrogate Call Waiting without basic Service via the menu.

Expected Behaviour
1. DUT displays a message to indicate the service has been activated.
2. DUT displays a message to indicate the service is activated.
3. DUT displays a message to indicate the service has been deactivated
4. DUT displays a message to indicate the service is deactivated
### 42.3.2 Call Waiting – with Basic Service

**Description**
Call Waiting service should inform a user that a second incoming call is waiting.

**Related GSM core specifications**
TS 24.083 clause 1.4

**Reason for test**
Ensure Call Waiting is working correctly.

**Initial configuration**
DUT in idle mode.
Call Waiting not activated on DUT.

**Test procedure**

**Scenario A: Code**
1. Activation. Dial *43*BS#
2. Interrogation. Dial *#43*BS#
3. Deactivation. Dial #43*BS#
4. Interrogation. Dial *#43*BS#

**Scenario B: Menu**
1. Activation. Activate Call Waiting with Basic Service via the menu.
2. Interrogation. Interrogate Call Waiting with Basic Service via the menu.
3. Deactivation. Deactivate Call Waiting with Basic Service via the menu.
4. Interrogation. Interrogate Call Waiting with Basic Service via the menu.

**Expected Behaviour**
1. DUT displays a message to indicate the service has been activated.
2. DUT displays a message to indicate the service is activated.
3. DUT displays a message to indicate the service has been deactivated.
4. DUT displays a message to indicate the service is deactivated.

### 42.3.3 Call Waiting – non provisioned SIM

**Description**
Call Waiting service should inform a user that a second incoming call is waiting.

**Related GSM core specifications**
TS 24.083 clause 1.4

**Reason for test**
Ensure DUT indicates that Call Waiting service is not available.

**Initial configuration**
DUT in idle mode.
Call Waiting not provisioned on the SIM.

**Test procedure**

**Scenario A: Code**
1. Activation. Dial *43#
2. Interrogation. Dial *#43#
3. Deactivation. Dial #43#

**Scenario B: Menu**
1. Activation. Activate Call Waiting without Basic Service via the menu.
2. Interrogation. Interrogate Call Waiting without basic Service via the menu.
3. Deactivation. Deactivate Call Waiting without Basic Service via the menu.

**Expected Behaviour**
1. DUT displays a message to indicate the service is not available.
2. DUT displays a message to indicate the service is not available.
3. DUT displays a message to indicate the service is not available.

### 42.3.4 Call Waiting, waiting call indication

**Description**
Normal operation of Call Waiting

**Related GSM core specifications**
TS 24.083 clause 1.1, 1.2.1, 1.2.3

**Reason for test**
Ensure that Call Waiting is correctly indicated and that the waiting call is accepted after the existing call is cleared

**Initial configuration**
DUT in idle mode.
Call Waiting activated on DUT.
Client 1 and Client 2 available.

**Test procedure**

**Scenario A: Local Call Clear**
1. Set up MO call to Client 1.
2. Arrange for an incoming call to be received from Client 2.
3. Clear the existing call on DUT.
4. Answer the waiting call.

**Scenario B: Local Call Hold**
1. Set up MO call to Client 1.
2. Arrange for an incoming call to be received from Client 2.
3. On DUT, place the existing call on hold.
4. Answer the waiting call.

**Scenario C: Distant Party clear**
1. Set up MO call to Client 1.
2. Arrange for an incoming call to be received from Client 2.
3. Clear the existing call on Client1.
4. Answer the waiting call.

**Expected behaviour**
1. Active voice call in progress between DUT and Client1.
2. Ensure that call waiting indication (appropriate tone and display) occurs.

3. Scenario A: First call is cleared and DUT alerts (could be with light, vibration, on screen display ringtone and/or beep).
   Scenario B: First call is on hold.
   Scenario C: First call is cleared and DUT alerts (could be with light, vibration, on screen display ringtone and/or beep).

4. The waiting call is accepted and 2-way audio is possible.

### 42.3.5 Call Waiting, Hold, Retrieve, Swap calls

**Description**
Operation of Call Hold

**Related GSM core specifications**
TS 24.083 sub clause 2.1

**Reason for test**
Ensure the correct operation of the hold-retrieve procedures

**Initial configuration**
DUT in idle mode.
Call Waiting activated on DUT.
Client 1 and Client 2 available.

**Test procedure**

**Scenario A: Code**
1. Set up MO call to Client 1.
2. Use code 2SEND to place Client 1 on hold.
3. Use code 1SEND to retrieve Client 1.
4. Use code DNSEND (where DN is Client 2) to make a second call.
5. Use code 2SEND to place Client 2 on hold and retrieve Client 1.

**Scenario B: Menu**
1. Set up MO call to Client 1.
2. Use the in call menu option to place Client 1 on hold.
3. Use the in call menu option to retrieve Client 1.
4. Use the Dialler to make a second call to Client2.
5. Use the Swap option in the menu to place Client 2 on hold and retrieve Client 1.

**Expected Behaviour**
1. Active voice call in progress between DUT and Client1.
2. Ensure Client 1 hears the call go on hold.
3. Ensure 2-way audio is present between DUT and Client 1.
4. Client 1 automatically is put on hold and a new call to Client 2 is established.
5. Client 2 is on hold and Client 1 is active.

### 42.3.6 Call Waiting, Interrupts during Call Waiting

**Description**
Interrupts during operation of Call Hold
Related GSM core specifications
TS 24.083 sub clause 2.1

Reason for test
Ensure the correct operation of call hold when the call is interrupted.

Initial configuration
DUT in idle mode.
Call Waiting activated on DUT.
Client 1 and Client 2 available.

Test procedure
1. Set up MO call to Client 1.
2. Use the Dialler to make a second call to Client2.
3. Clear the existing call on Client1.
4. Use the Dialler to make a second call to Client1.
5. Clear the existing call on Client2 while attempting to retrieve the call on DUT.
6. Use the Dialler to make a second call to Client2.
7. Clear the existing call on Client2.
8. Retrieve Call with Client 1.

Expected Behaviour
1. Active voice call in progress between DUT and Client1.
2. Client 1 automatically is put on hold and a new call to Client 2 is established.
3. DUT indicates that voice call with Client 1 has ended.
4. Client 1 automatically is put on hold and a new call to Client 1 is established.
5. DUT indicates that voice call with Client 2 has ended.
6. Client 1 automatically is put on hold and a new call to Client 2 is established.
7. DUT indicates that voice call with Client 2 has ended.
8. Ensure 2-way audio is present between DUT and Client 1.

42.4 Multi Party

Description
MultiParty call handling

Related GSM core specifications
TS 24.084 sub clause 1.1

Reason for test
Ensure that a MultiParty call handling is correctly implemented.

Initial configuration
• Call waiting activated
• MS with one call active and one on hold
• Ensure that a variety of call types (PSTN, ISDN, PABX, mobile) are used within the MultiParty call.
Test procedure

Scenario A:

1. Dial the code 3 SEND to join the calls. Check that all three parties can speak to each other.
2. Arrange for a further incoming call to be made. Check that the call is indicated, and then answer it, placing the multiparty call on hold automatically. Check that conversation is possible on the new call.
3. Dial the code 3 SEND to join the calls. Check that all four parties can speak to each other.
4. Place the multiparty call on hold by dialling code 2 SEND and make a new outgoing call with code DN SEND. Check that conversation is possible on the new call.
5. Place the new call on hold and retrieve the multiparty call by dialling code 2 SEND. Check that conversation is possible between all parties of the multiparty call.
6. Dial the code 3 SEND to join the calls. Check that all five parties can speak to each other.
7. Place the multiparty call on hold by dialling code 2 SEND and make a new outgoing call with code DN SEND. Check that conversation is possible on the new call.
8. Dial the code 3 SEND to join the calls. Check that all six parties can speak to each other.
9. Arrange for a further incoming call to be made (y). Check that the call is indicated, and then answer it, placing the multiparty call on hold automatically. Check that conversation is possible on the new call.
10. Dial the code 3 SEND to join call (y) to the multiparty. Check that the attempt fails, and that the mobile indicates that the maximum number of participants has been exceeded.
11. Place the new call (y) on hold and retrieve the multiparty call by dialling code 2 SEND. Clear one party from multiparty call by dialling code 1x SEND (x – number of call in the multiparty call e.g. 11 SEND will clear Party 1). Check that connection to call x has ended and only 5 parties remain in the multiparty call. Now dial the code 3 SEND to join call (y) to the multiparty. Check that the held call is added to the multiparty and all six parties can speak to each other.
12. Create a private communication with one of the distant parties with the code 2x SEND (x – number of call in the multiparty call e.g. 24 SEND will create private call with Party 4), placing the remainder of the parties on hold. Check that conversation is possible with the chosen party, and that the correct party has been selected.
13. Make the distant party release the call during private conversation. Check that the call can be switched back to the multi party call (2 SEND).
14. Select another party for a private conversation and dial 2x SEND (x – number of call in the multiparty call. e.g. 23 SEND will create private call with Party 3) and make this party release the call during the attempt to switch to the private conversation. Check that the multi party call can be retrieved with 2 SEND.
15. Have one of the distant parties clear from the call. Ensure that the multiparty call is not disturbed for the remaining participants.

Scenario B:

1. Using the menu functionality, join the calls. Check that all three parties can speak to each other.
2. Arrange for a further incoming call to be made. Check that the call is indicated, and then answer it, placing the multiparty call on hold automatically. Check that conversation is possible on the new call.
3. Using the menu functionality, join the calls. Check that all four parties can speak to each other.
4. Place the multiparty call on hold using the menu functionality and make a new outgoing call using the add call option available in the menu. Check that conversation is possible on the new call.
5. Place the new call on hold and retrieve the multiparty call by using the menu functionality to swap calls. Check that conversation is possible between all parties of the multiparty call.
6. Using the menu functionality, join the calls. Check that all five parties can speak to each other.
7. Place the multiparty call on hold using the menu functionality and make a new outgoing call using the add call option available in the menu. Check that conversation is possible on the new call.

8. Using the menu functionality, join the calls. Check that all six parties can speak to each other.

9. Arrange for a further incoming call to be made (y). Check that the call is indicated, and then answer it, placing the multiparty call on hold automatically. Check that conversation is possible on the new call.

10. Using the menu functionality, attempt to join call (y) to the multiparty. Check that either the attempt fails or the option to join the call is not available / not selectable. For mobiles where the menu option to join the calls is still available / selectable, confirm the mobile indicates that the maximum number of participants has been exceeded.

11. Place the new call (y) on hold and retrieve the multiparty call using the menu functionality for Swap Call. Clear one party (x) from multiparty call using the menu option to release an individual call. Check that connection to call (x) has ended and only 5 parties remain in the multiparty call. Use the menu functionality to join call (y) to the multiparty. Check that the held call is added to the multiparty and all six parties can speak to each other.

12. Create a private communication with one of the distant parties using the menu functionality, placing the remainder of the parties on hold. Check that conversation is possible with the chosen party, and that the correct party has been selected.

13. Make the distant party release the call during private conversation. Check that the Multi Party call can be retrieved via the menu functionality to retrieve.

14. Select another party for a private conversation using the menu functionality and make this party release the call during the attempt to switch to the private conversation. Check that the Multi Party call can be retrieved via the menu functionality to retrieve.

15. Have one of the distant parties clear from the call. Ensure that the multiparty call is not disturbed for the remaining participants.

Expected behaviour
The MS behaves as described in the test procedure.

**42.5 Advice of Charge**

**42.5.1 Advice of Charge (Charging)**

**42.5.1.1 MO call**

Description
Procedure for Advice of Charge (Charging) on an MO call

Related GSM core specifications
TS 24.086 sub clause 2.1.2

Reason for test
Ensure that AoCC information is correctly updated during an MO call.

Initial configuration
MS in idle mode, AoCC configured

Test procedure
1. Make a chargeable MO call. Check that the AoCC information is displayed both during and after the call, correctly indicating the expenditure of credit. Check that the SIM has been correctly updated by using a SIM card reader to check the value of \( E_{\text{ACM}} \).

2. Make a free MO call. Check that the AoCC information is displayed both during and after the call, correctly indicating no expenditure of credit.

3. Repeat procedures 1 and 2 for Fax and data calls if supported by the MS.
Expected behaviour
The AoCC information is displayed both during and after the call, correctly indicating any expenditure of credit. The SIM is correctly updated.

42.5.1.2 MT call
Description
Procedure for Advice of Charge (Charging) on an MT call
Related GSM core specifications
TS 24.086 sub clause 2.1.3
Reason for test
Ensure that AoCC information is correctly updated during an MT call.
Initial configuration
MS in idle mode, AoCC configured
Test procedure
1. Arrange to receive a chargeable MT call (e.g. when roaming in another country or network). Check that the AoCC information is displayed both during and after the call, correctly indicating the expenditure of credit. Check that the SIM has been correctly updated by using a SIM card reader to check the value of EF_{ACM}
2. Arrange to receive a free MT call. Check that the AoCC information is displayed both during and after the call, correctly indicating no expenditure of credit.
3. Repeat procedures 1 and 2 for Fax and data calls if supported by the MS

Expected behaviour
The AoCC information is displayed both during and after the call, correctly indicating any expenditure of credit. The SIM is correctly updated.

42.5.1.3 MultiParty, waiting and held calls
Description
Procedure for Advice of Charge (Charging) on Multiparty, waiting and held calls
Related GSM core specifications
TS 24.086 sub clause 2.1.2 and 2.1.3
Reason for test
Ensure that AoCC information is correctly updated during Multiparty and held calls.
Initial configuration
MS in idle mode, AoCC configured
Test procedure
Perform the procedure described above for MultiParty call handling. Check that the AoCC information is displayed both during and after the call, correctly indicating the charges for all the calls in progress. Check that the SIM has been correctly updated by using a SIM card reader to check the value of EF_{ACM}

Expected behaviour
The AoCC information is displayed both during and after the call, correctly indicating the charges for all the calls in progress. The SIM is correctly updated.
42.5.1.4 Loss of connection

Description
Procedure for Advice of Charge (Charging) on loss of radio connection

Related GSM core specifications
TS 24.086 sub clause 2.1.1

Reason for test
Ensure that AoCC charging ceases on loss of the connection because of bad radio conditions.

Initial configuration
MS in idle mode, AoCC configured

Test procedure
1. Make a chargeable MO call. Move into an area of no coverage, so that the call is lost. Ensure that AoCC charging stops being updated. Check that the SIM has been correctly updated by using a SIM card reader to check the value of EF\textsubscript{ACM}

2. Return to an area of coverage. If the call is automatically re-established, check that AoCC charging is resumed.

Expected behaviour
AoCC charging stops being updated on loss of connection, and resumes when the call is automatically re-established. The SIM is correctly updated.

42.5.1.5 Credit expiry

Description
Procedure for Advice of Charge (Charging) on credit expiry

Related GSM core specifications
TS 24.086 sub clause 2.1.3

Reason for test
Ensure that AoCC calls are cleared and no further calls except of Emergency calls are attempted on credit expiry

Initial configuration
MS in idle mode, AoCC configured, AoC limit set and enabled.

Test procedure
1. Make a chargeable MO call. Keep the call going until the indicated credit is used up. Ensure that the call is automatically cleared. Check that the SIM has been correctly updated by using a SIM card reader to check the value of EF\textsubscript{ACM}

2. With the credit expired, attempt to make an MO call. Check that the call attempt fails and that the MS does not attempt to send a call setup message to the network.

3. With the credit expired, attempt to make an Emergency call. Check that the call succeeds.

4. With the credit expired, receive an MT call. Check that the call succeeds

Expected behaviour
The AoCC information is displayed both during and after the call, correctly indicating any expenditure of credit. The SIM is correctly updated. On expiry of credit, the call is cleared and further MO call attempts fail (no call setup signalling to the network). Emergency calls can be made after credit expiry.

42.5.1.6 Tariff Switch

Description
Procedure for Advice of Charge (Charging) during a change in tariff
Related GSM core specifications
TS 24.086 sub clause 2.1.4

Reason for test
Ensure that AoCC information is correctly updated during an MO call when the network indicates a change of tariff during the call.

Initial configuration
MS in idle mode, AoCC configured

Test procedure
1. Make a chargeable MO call. Maintain the call in the active state at a time when the network changes the tariff for the call. Check that the AoCC information is displayed both during and after the call, correctly indicating the expenditure of credit. Check that the SIM has been correctly updated by using a SIM card reader to check the value of EF_{ACM}
2. Repeat procedures 1 for Fax and data calls if supported by the MS

Expected behaviour
The AoCC information is displayed both during and after the call, correctly indicating the expenditure of credit. The SIM is correctly updated.

42.5.2 Advice of Charge (Information)

42.5.2.1 MO call

Description
Procedure for Advice of Charge (Information) on an MO call

Related GSM core specifications
TS 24.086 sub clause 1.1.2

Reason for test
Ensure that AoCI information is correctly updated during an MO call.

Initial configuration
MS in idle mode, AoCI configured

Test procedure
1. Make a chargeable MO call. Check that the AoCI information is displayed both during and after the call, correctly indicating the expenditure of credit
2. Make a free MO call. Check that the AoCI information is displayed both during and after the call, correctly indicating no expenditure of credit.
3. Repeat procedures 1 and 2 for Fax and data calls if supported by the MS

Expected behaviour
The AoCI information is displayed both during and after the call, correctly indicating any expenditure of credit.

42.5.2.2 MT call

Description
Procedure for Advice of Charge (Information) on an MT call

Related GSM core specifications
TS 24.086 sub clause 1.1.3

Reason for test
Ensure that AoCI information is correctly updated during an MT call.
Initial configuration
MS in idle mode, AoCI configured

Test procedure
1. Arrange to receive a chargeable MT call (e.g. when roaming in another country or network). Check that the AoCI information is displayed both during and after the call, correctly indicating the expenditure of credit.
2. Arrange to receive a free MT call. Check that the AoCI information is displayed both during and after the call, correctly indicating no expenditure of credit.
3. Repeat procedures 1 and 2 for Fax and data calls if supported by the MS.

Expected behaviour
The AoCI information is displayed both during and after the call, correctly indicating any expenditure of credit.

42.5.2.3 Loss of connection

Description
Procedure for Advice of Charge (Information) on loss of radio connection

Related GSM core specifications
TS 24.086 sub clause 1.1.1

Reason for test
Ensure that AoCI charging ceases on loss of the connection because of bad radio conditions.

Initial configuration
MS in idle mode, AoCI configured

Test procedure
1. Make a chargeable MO call. Move into an area of no coverage, so that the call is lost. Ensure that AoCI charging stops being updated.
2. Return to an area of coverage. If the call is automatically re-established, check that AoCI charging is resumed.

Expected behaviour
AoCC charging stops being updated on loss of connection, and resumes when the call is automatically re-established.

42.5.2.4 MultiParty, waiting and held calls

Description
Procedure for Advice of Charge (Information) on Multiparty, waiting and held calls

Related GSM core specifications
TS 24.086 sub clause 1.1.2 and 1.1.3

Reason for test
Ensure that AoCI information is correctly updated during Multiparty and held calls.

Initial configuration
MS in idle mode, AoCI configured

Test procedure
Perform the procedure described above for MultiParty call handling. Check that the AoCI information is displayed both during and after the call, correctly indicating the charges for all the calls in progress.
Expected behaviour

The AoCI information is displayed both during and after the call, correctly indicating the charges for all the calls in progress. The SIM is correctly updated.

42.6 USSD

42.6.1 Idle mode Network initiated USSD Notify

NOTE: Network initiated USSD may be used in support of network features where the response by the MS results in a dialogue outside the scope of the USSD standards. Since these features may vary from network to network, no specific network feature is mentioned in this test.

Description

Ensure that network-initiated USSD operations are carried out correctly.

Related GSM core specifications

GSM 04.90 and GSM 03.38

Reason for test

To ensure that Network initiated USSD Notify is carried out correctly by the MS and to verify MS support for:

- Correct displaying of the USSD Notify content.
- Immediate answering with a Return Result message.
- USSD notify up to 182 characters
- The phase 2 character set
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- That MS should not implement any timer

Initial configuration

MS in idle mode

Test procedure

1. Send a USSD Notify to the MS. After receiving the Return Result message from the MS, send a Release Complete message.
2. Send a USSD Notify containing 182 characters (including 7-bit default alphabet).
3. Repeat step 1), sending another USSD Notify or Request after receiving the Return Result message.
4. Repeat step 1) sending the Release Complete message about 60 sec after receiving the Return Result message.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that is supported by means of USSD.

Expected behaviour

In step 1, the MS shall display the USSD Notify message and shall send immediately the Return Result message in response to it. The MS shall keep the signalling channel open until receiving the Release Complete message.

In step 2, the same as step 1. The MS shall display the complete message including the complete 7-bit default alphabet.

In step 3, the same as step 1, but displaying the next USSD message after clearing the first one.

In step 4, the same as step 1.
42.6.2  Dedicated mode Network initiated USSD Notify

NOTE: Network initiated USSD may be used in support of network features where the response by the MS results in a dialogue outside the scope of the USSD standards. Since these features may vary from network to network, no specific network feature is mentioned in this test.

Description
Ensure that network-initiated USSD operations are carried out correctly.

Related GSM core specifications
GSM 04.90 and GSM 03.38

Reason for test
To ensure that Network initiated USSD Notify is carried out correctly by the MS and to verify MS support for:

- Correct displaying of the USSD Notify content.
- Immediate answering with a Return Result message.
- USSD notify up to 182 characters
- The phase 2 character set
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- That MS should not implement any timer

Initial configuration
MS in dedicated mode

Test procedure
1. Send a USSD Notify to the MS. After receiving the Return Result message from the MS, send a Release Complete message.
2. Send a USSD Notify containing 182 characters (including 7-bit default alphabet).
3. Repeat step 1), sending another USSD Notify or Request after receiving the Return Result message.
4. Repeat step 1) sending the Release Complete message about 60 sec after receiving the Return Result message.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that is supported by means of USSD.

Expected behaviour
In step 1, the MS shall display the USSD Notify message and shall send immediately the Return Result message in response to the it. The MS shall keep the signalling channel open until receiving the Release Complete message. The MS shall ensure that the user will be able to read all the MMI messages about USSD and dedicated mode.

In step 2, the same as step 1. The MS shall display the complete message including the complete 7-bit default alphabet.

In step 3, the same as step 1, but displaying the next USSD message after clearing the first one.

In step 4, the same as step 1.

42.6.3  Idle mode Network initiated USSD Request

Description
Ensure that network-initiated USSD Request operates correctly.
Related GSM core specifications
GSM 04.90 and GSM 03.38

Reason for test
To ensure that Network initiated USSD Request is carried out correctly by the MS and to verify MS support for:

- Correct displaying of the USSD Request content.
- Allowing the user to enter a response and sending it in a Return Result message.
- USSD Request and return result up to 182 characters
- The phase 2 character set in USSD Request and return result
- The MS shall avoid confusing 7 binary zero pad bits as the @ character in the response.
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- That MS should not implement any timer
- Releasing of the communication upon request of the user.

Initial configuration
MS in idle mode

Test procedure
1. Send a USSD Request to the MS. After receiving the Return Result message from the MS with the answer of the user, send a Release Complete message.
2. Repeat step 1) sending a USSD Request containing 182 characters (including 7-bit default alphabet).
3. Repeat step 1) answering with a return result containing 182 characters (including 7-bit default alphabet).
4. Repeat step 1) answering with a return result containing (8n-1) characters (n equals 1, 2, 3,...)
5. Repeat step 1), sending another USSD Notify or Request after receiving the Return Result message.
6. Repeat step 1) sending the Release Complete message about 60 sec after sending the USSD Request message (regardless the MS answers or not).
7. Send a USSD Request to the MS. Then, send to the network a Release complete message upon request of the user.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that is supported by means of USSD.

Expected behaviour
In step 1, the MS shall display the USSD Request message and shall permit the user to answer it. The MS shall send this answer in a Return Result message. The MS shall keep the signalling channel open until receiving the Release Complete message.

In step 2, the same as step 1. The MS shall display the complete message including the complete 7-bit default alphabet.

In step 3, the same as step 1. The MS shall send the complete message including the complete 7-bit default alphabet.

In step 4, The MS shall avoid confusing 7 binary zero pad bits as the @ character, the CR character shall be used for padding in this situation.

In step 5, the same as step 1, but displaying the next USSD message after answering the first one.

In step 6, the same as step 1 The MS shall keep the signalling channel open until receiving the Release Complete message.
In step 7, the same as step 1, but sending Release Complete message instead of the Return Result message.

### 42.6.4 Dedicated mode Network initiated USSD Request

#### Description
Ensure that network-initiated USSD Request operates correctly.

#### Related GSM core specifications
GSM 04.90 and GSM 03.38

#### Reason for test
To ensure that Network initiated USSD Request is carried out correctly by the MS and to verify MS support for:
- Correct displaying of the USSD Request content.
- Allowing the user to enter a response and sending it in a Return Result message.
- USSD Request and return result up to 182 characters
- The phase 2 character set in USSD Request and return result
- The MS shall avoid confusing 7 binary zero pad bits as the @ character in the response.
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- That MS should not implement any timer
- Releasing of the communication upon request of the user.

#### Initial configuration
MS in dedicated mode

#### Test procedure
1. Send a USSD Request to the MS. After receiving the Return Result message from the MS with the answer of the user, send a Release Complete message.
2. Repeat step 1) sending a USSD Request containing 182 characters (including 7-bit default alphabet).
3. Repeat step 1) answering with a return result containing 182 characters (including 7-bit default alphabet).
4. Repeat step 1) answering with a return result containing \((8n-1)\) characters (n equals 1, 2, 3,...)
5. Repeat step 1), sending another USSD Notify or Request after receiving the Return Result message.
6. Repeat step 1) sending the Release Complete message about 60 sec after sending the USSD Request message (regardless the MS answers or not).
7. Send a USSD Request to the MS. Then, send to the network a Release complete message upon request of the user.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that is supported by means of USSD.

#### Expected behaviour
In step 1, the MS shall display the USSD Request message and shall permit the user to answer it. The MS shall send this answer in a Return Result message. The MS shall keep the signalling channel open until receiving the Release Complete message. The MS shall ensure that the user will be able to read all the MMI messages about USSD and dedicated mode.

In step 2, the same as step 1. The MS shall display the complete message including the complete 7-bit default alphabet.
In step 3, the same as step 1. The MS shall send the complete message including the complete 7-bit default alphabet.

In step 4, The MS shall avoid confusing 7 binary zero pad bits as the @ character, the CR character shall be used for padding in this situation.

In step 5, the same as step 1, but displaying the next USSD message after answering the first one.

In step 6, the same as step 1 The MS shall keep the signalling channel open until receiving the Release Complete message.

In step 7, the same as step 1, but sending Release Complete message instead of the Return Result message.

42.6.5 Idle mode MO USSD

NOTE: MS-initiated USSD is used within the network to allow for the invocation of features for other services, such as CAMEL. Since these features may vary from network to network, no specific network feature is mentioned in this test.

Description

Ensure that MS-initiated USSD operations are carried out correctly.

Related GSM core specifications

GSM 04.90 and GSM 03.38

Reason for test

To ensure that MS initiated USSD operations are carried out correctly and to verify MS support for:

- A minimum of 25 digits (a maximum of 182 characters are specified)
- A network response of up to 182 characters
- Support for the phase 2 character set
- The MS shall avoid confusing 7 binary zero pad bits as the @ character.
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- Correct handling of the international + symbol
- That MS should not implement any timer

Initial configuration

MS in idle mode

The MMI Clock display and SMS-CB are enabled.

Test procedure

1. By means of appropriate MMI commands, invoke a USSD request. Check to see whether the network feature invoked responds as expected.
2. Repeat step 1) using a USSD request containing at least 25 digits.
3. Repeat step 1) using a USSD request that will invoke a network response containing 182 characters (including 7-bit default alphabet).
4. Repeat step 1) using a USSD string containing an international + symbol.
5. Repeat step 1) using a USSD string where the total number of characters to be sent equals \((8n-1)\) and there are 7 spare bits at the end of the message.
6. Repeat step 1) using a USSD request that will delay the network response about 60 seconds.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that is supported by means of USSD.
NOTE: Standardised MMI command strings for various USSD operations are listed in GSM 11.10-1 sub clause 31.10 and may be used where appropriate. Expected behaviour

Expected behaviour

In step 1 the network feature is invoked as expected. The precise behaviour depends on the specific feature that USSD is being used to support.

In step 2, the MS shall send all of the 25 digits entered.

In step 3, the MS shall display the complete message until cleared by user including the complete 7-bit default alphabet.

In step 4, the MS shall allow the international + symbol to be inserted into a USSD string and shall send the complete string in the correct sequence.

In step 5, The MS shall avoid confusing 7 binary zero pad bits as the @ character, the CR character shall be used for padding in this situation.

In step 6, the MS shall wait until the network sends back the response, so the MS shall avoid sending a Release complete message to the network.

42.6.6 Dedicated mode MO USSD

NOTE: MS-initiated USSD is used within the network to allow for the invocation of features for other services, such as CAMEL. Since these features may vary from network to network, no specific network feature is mentioned in this test.

Description

Ensure that MS-initiated USSD operations are carried out correctly when the MS is in dedicated mode.

Related GSM core specifications

GSM 04.90 and GSM 03.38

Reason for test

To ensure that MS initiated USSD operations are carried out correctly when the MS is in dedicated mode and to verify support for:

- A minimum of 25 digits (a maximum of 182 characters are specified)
- A network response of up to 182 characters
- Support for the phase 2 character set
- The MS shall avoid confusing 7 binary zero pad bits as the @ character.
- That USSD is not interrupted by interaction with the MMI Clock display, SMS-CB, or other USSD functions
- Correct handling of the international + symbol
- That MS should not implement any timer

Initial configuration

MS in dedicated mode

The MMI Clock display and SMS-CB are enabled.

Test procedure

1. By means of appropriate MMI commands, invoke a USSD request. Check to see whether the network feature invoked responds as expected. The response should be displayed until cleared by the user.
2. Repeat step 1) using a USSD request containing at least 25 digits.
3. Repeat step 1) using a USSD request that will invoke a network response containing 182 characters (including 7-bit default alphabet).
4. Repeat step 1) using a USSD string containing an international + symbol.

5. Repeat step 1) using a USSD string where the total number of characters to be sent equals \((8n-1)\) and there are 7 spare bits at the end of the message.

6. Repeat step 1) using a USSD request that will delay the network response about 60 seconds.

The test shall be repeated as many times as necessary to cover the different services and options within the MS that are supported by means of USSD.

NOTE: Standardised MMI command strings for various USSD operations are listed in GSM 11.10-1 sub clause 31.10 and may be used where appropriate expected behaviour

**Expected behaviour**

In step 1 the network feature is invoked as expected. The precise behaviour depends on the specific feature that USSD is being used to support. The MS shall ensure that the user will be able to read all the MMI messages about USSD and dedicated mode.

In step 2, the MS shall send all of the 25 digits entered

In step 3; the MS shall display the complete message until cleared by user including the complete 7-bit default alphabet.

In step 4, the MS shall allow the international + symbol to be inserted into a USSD string and shall send the complete string in the correct sequence.

In step 5, The MS shall avoid confusing 7 binary zero pad bits as the @ character, the CR character shall be used for padding in this situation.

In step 6, the MS shall wait until the network sends back the response, so the MS shall avoid sending a Release complete message to the network.

**42.6.7 USSD sequences for CCBS**

NOTE: CCBS (Call Completion for Busy Subscriber) is activated with the MMI codes “5<send>” or “*37#<send>“. These sequences are sent as USSD to the network. The network may respond with mobile terminated USSD sequences.

**Description**

Ensure activation of CCBS requests is performed using USSD successfully.

**Related GSM core specifications**

3GPP TS 24.090, TS 23.038, TS 22.030, TS 22.093

**Reason for test**

To ensure that activation of CCBS requests is carried out correctly when the calling party is busy. When CCBS is subscribed the network informs the user, e.g. by inband voice notification, that the calling party is busy and that the user may activate call completion with entering the sequence 5<send> or *37#<send>. It is tested that the device

In dedicated mode:

- Supports short USSD code “5<send>”
- Supports USSD code “*37#<send>”

In idle mode:

- Supports interrogation of CCBS with the USSD code “*#37#<send>”

**Initial Condition**

A second device, e.g. a mobile phone, is required. Call wait and call forwarding is deactivated for this device. Ensure that this device is busy, e.g. perform an originated call to any destination. Short dialling with 5<send> is deactivated at the device under test.
Test procedure

1. Perform an originated call from the device under test (DUT) to the second (still busy) device. Now the network notifies the user, e.g. by inband voice notification, that CCBS is possible.
2. Enter 5<send> and check that the network notifies the user, e.g. by MT USSD, that CCBS is successfully activated. Release the call on the device under test.
3. Interrogate the status of CCBS by entering *#37#<send> in idle mode. Check that the networks response is displayed correctly.
4. Release the second device. Now call completion is activated. Check the incoming call on the DUT and accept the call. Check that the second device is alerting, accept the call on the second device. Release the call.
5. Repeat step 1) - 5) using the USSD string *37#<send> in step 3 instead of 5<send>.

Expected behaviour

1. The information from the network that the called party is busy is presented as expected, e.g. as inband voice notification.
2. The USSD sequence 5<send> is sent successfully to the network and the network informs the user, e.g. by MT USSD, that CCBS is activated successfully. The connection to the network can be released successfully.
3. The USSD sequence *#37# is sent successfully while in idle mode. The response from the network, as MT USSD, is as expected.
4. The incoming CCBS call could be accepted successfully. Afterwards the second device is ringing and the end to end voice connection is successful after accepting the call on the second device.
5. Same as steps 2 – 5 except that the USSD string *37#<send> in step 4 is 5<send>.

42.7 Calling Line Identification Presentation (CLIP)

The Calling Line Identification Presentation is concerned with the display of the incoming caller identity during an MT call. When the service is enabled, the incoming caller ID will be displayed on the receiving DUT. When the service is disabled, the incoming caller ID is not displayed on the receiving DUT.

42.7.1 CLIP Enabled

42.7.1.1 Interrogation

Description

The DUT shall display the status of CLIP when interrogated by a user.

Related GSM core specifications

TS 24.081 sub clause 1.2, 3GPP TS 22.081

Reason for test

To ensure the DUT displays the status of CLIP when interrogated.

Initial configuration

SIM card with CLIP provisioning enabled inserted in DUT.
DUT in idle mode.

Test procedure

Scenario A: Code

Dial *#30#

Scenario B: Menu

Via the DUT menu, interrogate the CLIP status.
Expected behaviour
The DUT interrogates the network status of CLIP and displays an indication that the service is enabled.

42.7.1.2 Provisioning Check
Description
The DUT shall display the incoming caller ID when CLIP is enabled.

Related GSM core specifications
TS 24.081 sub clause 1.2, 3GPP TS 22.081

Reason for test
To ensure the DUT displays the incoming caller ID when CLIP is enabled.

Initial configuration
BS – Basic Service: Voice, FAX, Video
SIM card with CLIP provisioning enabled inserted in DUT.
DUT in idle mode.

Test procedure
Scenario A: Not Stored
1. Delete all entries in DUT phonebook.
2. Receive MT BS call from Client 1.
3. Answer call at DUT.

Scenario B: Stored
1. Store Client 1 MSISDN in DUT phonebook.
2. Receive MT BS call from Client 1.
3. Answer call at DUT.

Expected behaviour
1. DUT phonebook is updated.
2. Scenario A: Confirm DUT displays the MSISDN of Client 1 during call.
   Scenario B: Confirm DUT displays the corresponding PB entry name of Client 1 during call.
3. A connection in both directions is established.

42.7.2 CLIP Disabled

42.7.2.1 Interrogation
Description
The DUT shall display the status of CLIP when interrogated by a user.

Related GSM core specifications
TS 24.081 sub clause 1.2, 3GPP TS 22.081

Reason for test
To ensure the DUT displays the status of CLIP when interrogated.

Initial configuration
SIM card with CLIP provisioning disabled inserted in DUT.
DUT in idle mode.
Test procedure
Scenario A: Code
Dial *#30#

Scenario B: Menu
Via the DUT menu, interrogate the CLIP status.

Expected behaviour
The DUT interrogates the network status of CLIP and displays an indication that the service is disabled.

42.7.2.2 Provisioning Check

Description
The DUT shall hide the incoming caller ID when CLIP is disabled.

Related GSM core specifications
TS 24.081 sub clause 1.2, 3GPP TS 22.081

Reason for test
To ensure the DUT hides the incoming caller ID when CLIP is disabled.

Initial configuration
BS – Basic Service: Voice, FAX, Video
SIM card with CLIP provisioning disabled inserted in DUT.
DUT in idle mode.

Test procedure
Scenario A: Not Stored
1. Delete all entries in DUT phonebook.
2. Receive MT BS call from Client 1.
3. Answer call at DUT.

Scenario B: Stored
1. Store Client 1 MSISDN in DUT phonebook.
2. Receive MT BS call from Client 1.
3. Answer call at DUT.

Expected behaviour
1. DUT phonebook is updated.
2. Confirm DUT does not display the MSISDN/PB entry name of Client 1 during call. It displays “unknown”, “private” or similar.
3. A connection in both directions is established.

42.8 Calling Line Identification Restriction (CLIR)

The Calling Line Identification Restriction is concerned with the display of the outgoing caller identity during an MO call. When the service is enabled, the outgoing caller ID will be restricted and not displayed on receiving Client. When the service is disabled, the outgoing caller ID is displayed on the receiving Client.
42.8.1 CLIR Enabled

42.8.1.1 Interrogation

Description
The DUT shall display the status of CLIR when interrogated by a user.

Related GSM core specifications
TS 24.081 clause 5, TS 24.081 sub clause 2.3, 3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT displays the status of CLIR when interrogated by a user.

Initial configuration
SIM card with CLIR provisioning enabled in DUT.
DUT in idle mode.

Test procedure
Scenario A: Code
Dial *#31#

Scenario B: Menu
Via the DUT menu, interrogate the CLIR status.

Expected behaviour
The DUT interrogates the network status of CLIR and displays indication that the service is enabled.

42.8.1.2 Provisioning Check

Description
The DUT shall restrict the outgoing caller ID when CLIR is enabled.

Related GSM core specifications
TS 24.081 sub clause 1.2, 3GPP TS 22.081

Reason for test
To ensure the DUT restricts the outgoing caller ID when CLIR is enabled.

Initial configuration
BS – Basic Service: Voice, FAX, Video

Test procedure
Scenario A: Network Default Setting: CLIR Enabled
1. Insert SIM card with CLIR provisioning enabled in DUT.
2. In DUT menu, ensure setting for "show my number" in outgoing calls is set to network default.
3. Make MO BS call to Client 1.
4. Answer call at Client 1.

Scenario B: CLIR Temporarily Enabled (Menu)
1. Insert SIM card with CLIR provisioning disabled in DUT.
2. In DUT menu, ensure setting for "show my number" in outgoing calls is set to "hide number".
3. Make MO BS call to Client 1.
4. Answer call at Client 1.

Scenario C: CLIR Temporarily Enabled (Code)
1. Insert SIM card with CLIR provisioning disabled in DUT.
2. In DUT menu, ensure setting for “show my number” in outgoing calls is set to network default.
3. Make MO BS call to Client 1 by dialling #31#DN.
4. Answer call at Client 1.

**Expected behaviour**
1. DUT has appropriate SIM inserted and is in IDLE mode.
2. CLIR option in DUT menu is selected accordingly.
3. Confirm Client 1 does not display the MSISDN of DUT during call. It displays “unknown”, “private” or similar.
4. A connection in both directions is established.

### 42.8.2 CLIR Disabled

#### 42.8.2.1 Interrogation

**Description**
The DUT shall display the status of CLIR when interrogated by a user.

**Related GSM core specifications**
TS 24.081 clause 5, TS 24.081 sub clause 2.3, 3GPP TS 26.110 and TS 26.111

**Reason for test**
To ensure the DUT displays the status of CLIR when interrogated by a user.

**Initial configuration**
SIM card with CLIR provisioning disabled in DUT.
DUT in idle mode.

**Test procedure**

**Scenario A: Code**
Dial *#31#

**Scenario B: Menu**
Via the DUT menu, interrogate the CLIR status.

**Expected behaviour**
The DUT interrogates the network status of CLIR and displays indication that the service is disabled.

#### 42.8.2.2 Provisioning Check

**Description**
The DUT shall send the outgoing caller ID when CLIR is disabled.

**Related GSM core specifications**
TS 24.081 sub clause 1.2, 3GPP TS 22.081

**Reason for test**
To ensure the DUT sends the outgoing caller ID when CLIR is disabled.

**Initial configuration**
BS – Basic Service: Voice, FAX, Video

**Test procedure**

**Scenario A: Network Default setting: CLIR Disabled**
1. Insert SIM card with CLIR provisioning disabled in DUT.
2. In DUT menu, ensure setting for "show my number" in outgoing calls is set to network default.
3. Make MO BS call to Client 1.
4. Answer call at Client 1.

Scenario B: CLIR Temporarily Disabled (Menu)
1. Insert SIM card with CLIR provisioning enabled in DUT.
2. In DUT menu, ensure setting for "show my number" in outgoing calls is set to "show number".
3. Make MO BS call to Client 1.
4. Answer call at Client 1.

Scenario C: CLIR Temporarily Disabled (Code)
1. Insert SIM card with CLIR provisioning enabled in DUT.
2. In DUT menu, ensure setting for "show my number" in outgoing calls is set to network default.
3. Make MO BS call to Client 1 by dialling *31#DN.
4. Answer call at Client 1.

Expected behaviour
1. DUT has appropriate SIM inserted and is in IDLE mode.
2. CLIR option in DUT menu is selected accordingly.
3. Confirm Client 1 displays the MSISDN of DUT during call.
4. A connection in both directions is established.

43 Multimedia Message Service (MMS)

43.1 MMS Mobile originated

43.1.1 Mobile originated with different address format

43.1.1.1 Send message with various MSISDN address formats

Description
Verification that the MS sends correctly the message, when the international, the national and the short MSISDN address formats are used.

Reason for test
To ensure that the MS sends correctly the message, when the international, the national and the short MSISDN address formats are used.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
1. Create a new MMS message, add a MSISDN recipient with the national MSISDN address format (for example: 0172 123456...). Then send the message. The MS displays a message that the MMS has been sent. Verify that the message is correctly received by the B-subscriber.
2. Repeat the test using the international MSISDN address format (for example: +49 172 123456...).
3. Repeat the test using the short MSISDN address format (for example: 1234...).

**Expected behaviour**
The message is sent and correctly received by the B-subscriber.

### 43.1.1.2 Send message when the sender is anonymous

**Description**
Verification that the MS correctly sends an anonymous MMS.

**Reason for test**
To ensure that the MS correctly sends an anonymous MMS.

**Related GSM core specifications**
3GPP TS 26.234.

**Initial configuration**
MS in idle mode.

**Test procedure**
Create a new MMS and select from the menu option “send as anonymous”. Then send the message. The MS displays a message that the MMS has been sent. Verify that the message will be received and the sender’s address is not visible.

**Expected behaviour**
The message is sent and correctly received by the B-subscriber. The sender’s address is not visible.

### 43.1.1.3 Send message with MSISDN recipient using the “To”, the “Cc” or the “Bcc” field

**Description**
Verification that the MS correctly sends the message when one of the “To”, the “Cc” or the “Bcc” address fields is used.

**Reason for test**
To ensure that the MS correctly sends the message when one of the “To”, the “Cc” or the “Bcc” address fields is used.

**Related GSM core specifications**
WAP-209-MMS Encapsulation-20020105-a.

**Initial configuration**
MS in idle mode.

**Test procedure**
1. Create a new MMS message, add a MSISDN recipient only to the “To” address field. Send the message. The MS displays a message that the MMS has been sent. Verify that the message is correctly received by the B-subscriber.
2. Repeat the test using only the “Cc” address field.
3. Repeat the test using only the “Bcc” address field.

**Expected behaviour**
The message is correctly sent and received by the B-subscriber.
43.1.1.4  Send message with email recipient using the “To”, the “Cc” or the “Bcc” field

Description
Verification that the MS correctly sends the message when the “To”, the “Cc” or the “Bcc” address field is used to insert the email address format.

Reason for test
To ensure that the MS correctly sends the message when the “To”, the “Cc” or the “Bcc” address field is used to insert the email address format.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Create a new MMS with a text, picture and sound object, then add an email recipient to the “To” address field. Then send the MMS. The MS displays a message that the MMS has been sent. Verify that the email recipient receives the message and that the address fields and the email body are correctly used.
2. Repeat the test using the “Cc” address field.
3. Repeat the test using the “Bcc” address field.

Expected behaviour
The message is correctly sent and received by the email recipient indicating the appropriate address fields.

43.1.1.5  Send message with multiple recipients

Description
Verification that it is possible to send a MMS to more than one recipient.

Reason for test
To ensure that it is possible to send a MMS to more than one recipient.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
Create a new MMS with a text, picture and sound object, add 20 recipients from the phonebook, using both email and phone number address format. Use all three address fields (To, Cc, and Bcc). Send the MMS. The MS displays a message that the MMS has been sent. Verify that the MMS recipients receive the message and that the MMS / email is correctly received.

Expected behaviour
The message is correctly sent and received by all recipients indicating the appropriate address fields.

43.1.1.6  Send message with multiple and unsubscribed recipient

Description
Verification that the MMS will be sent, when a legacy user and an MMS unsubscribed user is inserted as recipient.
Reason for test
To ensure that the MMS will be sent, when a legacy user and an MMS unsubscribed user is inserted as recipient.

Related GSM core specifications
None.

Initial configuration
MS in idle mode, MMS unsubscribed recipient and legacy recipient available.

Test procedure
Create a new MMS with a text, picture and sound object, add some recipients from the phonebook. Use all three address fields (To, Cc, and Bcc). Add at least one legacy and one MMS unsubscribed recipient. Send the MMS. For the unsubscribed user the MS displays a message that the Recipient is not subscribed. For the valid recipients the MS displays a message that the MMS has been sent. Verify that the valid MMS recipients receive the message and that the MMS is correctly received.

Expected behaviour
The message is sent with the appropriate display messages and received by all valid recipients indicating the appropriate address fields.

43.1.2 Mobile originated with different fields and objects

43.1.2.1 Send message with subject (maximum length)

Description
Verification that the maximum length of the subject field is correctly supported.

Reason for test
To ensure that the maximum length of the subject field is correctly supported.

Related GSM core specifications
MMS Conformance Document Version 2.0.0

Initial configuration
MS in idle mode.

Test procedure
Create a new MMS and insert a text object. Fill the subject field with the maximum length of 40 characters. Send the message. The MS displays a message that the MMS has been sent. Verify that all characters of the subject are sent to the recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the complete subject field.

43.1.2.2 Send message with text (maximum length)

Description
Verification that the maximum length of the text field is correctly supported.

Reason for test
To ensure that the maximum length of the text field is correctly supported.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.
Test procedure
Create a new MMS and insert a text object. Fill the text object with the maximum length of 1000 characters. Send the message. The MS displays a message that the MMS has been sent. Verify that all characters of the text are sent to the recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the complete text field.

43.1.2.3 Send message with sound object (iMelody)
Description
Verification that the sound object “iMelody” is correctly supported.

Reason for test
To ensure that the sound object “iMelody” is correctly supported.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, iMelody available in the sound browser of the MS.

Test procedure
Create a new MMS and insert an iMelody sound object. Send the message. The MS displays a message that the MMS has been sent. Verify that the iMelody is played at the recipient while the MMS is viewed and that the sound between the two MSs is comparable.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate iMelody sound.

43.1.2.4 Send message with polyphonic sound object (MIDI)
Description
Verification that the polyphonic sound object “MIDI” is correctly supported.

Reason for test
To ensure that the sound object “MIDI” is correctly supported.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, MIDI available in the sound browser of the MS.

Test procedure
Create a new MMS and insert a MIDI sound object. Send the message. The MS displays a message that the MMS has been sent. Verify that the MIDI is played at the recipient while the MMS is viewed and that the sound between the two MSs is comparable.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate MIDI sound.

43.1.2.5 Send message with AMR sound
Description
Verification that the AMR sound object is correctly supported.

Reason for test
To ensure that the AMR sound object is correctly supported.
Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, AMR sound available in the sound browser of the MS.

Test procedure
Create a new MMS and insert an AMR sound object. Send the message. The MS displays a message that the MMS has been sent. Verify that the sound is played at the recipient while the MMS is viewed and that the sound between the two MSs is comparable.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate sound object.

43.1.2.6  Send message with GIF image (different sizes)

Description
Verification that different GIF images are correctly supported.

Reason for test
To ensure that different GIF images are correctly supported.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, GIF image available in the picture browser of the MS.

Test procedure

1. Create a new MMS and insert a GIF image object. Send the message. The MS displays a message that the MMS has been sent. Verify that the image can be displayed at the recipient while the MMS is viewed.

2. Repeat the test using different GIF image sizes.

Expected behaviour
The message is correctly sent and received by the recipient with the correct GIF image.

43.1.2.7  Send message with animated GIF image (different sizes)

Description
Verification that animated GIF images are correctly supported.

Reason for test
To ensure that animated GIF images are correctly supported.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, animated GIF image available in the picture browser of the MS.
Test procedure

1. Create a new MMS and insert an animated GIF image object. Send the message. The MS displays a message that the MMS has been sent. Verify that the image can display and that it is animated at the recipient while the MMS is viewed.

2. Repeat the test using different animated GIF image sizes.

Expected behaviour

The message is correctly sent and received by the recipient with the correctly animated GIF image.

43.1.2.8 Send message with JPEG image (different sizes)

Description

Verification that JPEG images are correctly supported.

Reason for test

To ensure that JPEG images are correctly supported.

Related GSM core specifications

3GPP TS 26.234

MMS Conformance Document Version 2.0.0.

Initial configuration

MS in idle mode, JPEG image available in the picture browser of the MS.

Test procedure

1. Create a new MMS and insert a JPEG image object. Send the message. The MS displays a message that the MMS has been sent. Verify that the image can display at the recipient while the MMS is viewed.

2. Repeat the test using different JPEG image sizes.

Expected behaviour

The message is correctly sent and received by the recipient with the correct JPEG image.

43.1.2.9 Send message with WBMP image (different sizes)

Description

Verification that WBMP images are correctly supported.

Reason for test

To ensure that WBMP images are correctly supported.

Related GSM core specifications

3GPP TS 26.234

MMS Conformance Document Version 2.0.0.

Initial configuration

MS in idle mode, WBMP image available in the picture browser of the MS.

Test procedure

1. Create a new MMS and insert a WBMP image object. Send the message. The MS displays a message that the MMS has been sent. Verify that the image can display at the recipient while the MMS is viewed.

2. Repeat the test using different WBMP image sizes.

Expected behaviour

The message is correctly sent and received by the recipient with the correct WBMP image.
43.1.2.10 Send message with different objects

Description
Verification that it is possible to send a MMS with different objects.

Reason for test
To ensure that it is possible to send a MMS with different objects.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, at least 2 different pictures and 2 different sound objects available in the MS.

Test procedure
Create a new MMS and insert at least 2 different text, 2 different picture and 2 different sound objects. Send the message. The MS displays a message that the MMS has been sent. Verify that all objects are correctly available at the recipient while the MMS is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with all objects.

43.1.2.11 Send message with Business Card attached

Description
Verification that it is possible to send a MMS with an attached Business Card.

Reason for test
To ensure that it is possible to send a MMS with an attached Business Card.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, Business Card available in the organiser of the MS.

Test procedure
Create a new MMS and attach a Business Card or add a contact from the phonebook as attachment. Send the message. The MS displays a message that the MMS has been sent. Verify that the Business Card can be displayed at the recipient while the MMS is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the Business Card.

43.1.2.12 Send message with appointment attached

Description
Verification that it is possible to send a MMS with an attached appointment from the organizer.

Reason for test
To ensure that it is possible to send a MMS with an attached appointment from the organizer.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, appointment available in the organiser of the MS.
Test procedure
Create a new MMS and attach an appointment from the organizer. Send the message. The MS displays a message that the MMS has been sent. Verify that the appointment can be displayed at the recipient while the MMS is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the attached appointment.

43.1.2.13 Send message with VNotes attached

Description
Verification that it is possible to send a MMS with an attached VNote from the organizer.

Reason for test
To ensure that it is possible to send a MMS with an attached VNote from the organizer.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, VNote available in the organiser of the MS.

Test procedure
Create a new MMS and attach a VNote from the organizer. Send the message. The MS displays a message that the MMS has been sent. Verify that the VNote can be displayed at the recipient while the MMS is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the attached VNote.

43.1.2.14 Send message with different objects to email client

Description
Verification that it is possible to send a MMS with different objects to an email client.

Reason for test
To ensure that it is possible to send a MMS with different objects to an email client.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, JPEG-, GIF-, WBMP-, AMR- and melody objects available in the organiser of the MS.

Test procedure
1. Create a new MMS with a text object. Send the message to an email recipient. The MS displays a message that the MMS has been sent. Verify that the email recipient receives the message and that the text object is embedded in the email.
2. Repeat the test with a JPEG object
3. Repeat the test with a GIF object
4. Repeat the test with a WBMP object
5. Repeat the test with an AMR sound object
6. Repeat the test with an iMelody object
7. Repeat the test with a MIDI object
8. Repeat the test with multiple pages and different objects.
Expected behaviour
The message is correctly sent and received by the email recipient with the appropriate embedded objects.

43.1.2.15 Send message with Business Card to email client

Description
Verification that it is possible to send a MMS with an attached Business Card to an email client.

Reason for test
To ensure that it is possible to send a MMS with an attached Business Card to an email client.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, Business Card available in the organiser of the MS.

Test procedure
Create a new MMS and attach a Business Card. Send the message to an email client. The MS displays a message that the MMS has been sent. Verify that the Business Card is attached to email received by the recipient.

Expected behaviour
The message is correctly sent and received by the email recipient with the Business Card.

43.1.3 Send MMS with Priorities

43.1.3.1 Send message with NORMAL priority

Description
Verification that the MMS priority is correctly supported by the MS.

Reason for test
To ensure that the MMS priority is correctly supported by the MS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Create a new MMS and set the priority to “normal”. Send the message. The MS displays a message that the MMS has been sent. Verify that the message received by the recipient has “normal” priority.
2. Repeat the test using an email client as recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate priority.

43.1.3.2 Send message with LOW priority

Description
Verification that the MMS priority is correctly supported by the MS.

Reason for test
To ensure that the MMS priority is correctly supported by the MS.
43.1.3.3 Send message with HIGH priority

Description
Verification that the MMS priority is correctly supported by the MS.

Reason for test
To ensure that the MMS priority is correctly supported by the MS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Create a new MMS and set the priority to “high”. Send the message. The MS displays a message that the MMS has been sent at “high” priority. Verify that the message received by the recipient has “high” priority.
2. Repeat the test using an email client as recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate priority.

43.1.4 Reply and Forward Messages

43.1.4.1 Reply to message with single recipient

Description
Verification that the MS correctly supports the reply to a MMS with a single recipient.

Reason for test
To ensure that the MS correctly supports the reply to a MMS with a single recipient.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, received MMS with various email and MSISDN recipients in the “To”-, “Cc”- and “Bcc”-address field in the MMS message store.
Test procedure

1. Create a new MMS by replying to one recipient having a MSISDN address. Send the message to an email client. The MS displays a message that the MMS has been sent. Verify that the message is received by the correct recipient.

2. Repeat the test replying to one recipient having an email address

3. Repeat the test replying to one recipient in the “Cc” address field

4. Repeat the test replying to one recipient in the “Bcc” address field.

Expected behaviour

The message is correctly sent and received by the appropriate recipient.

43.1.4.2 Reply to message with multiple recipients

Description

Verification that the MS correctly supports the reply to a MMS with multiple recipients.

Reason for test

To ensure that the MS correctly supports the reply to a MMS with multiple recipients.

Related GSM core specifications

3GPP TS 26.234.

Initial configuration

MS in idle mode, received MMS with various email and MSISDN recipients in the “To”, “Cc”- and “Bcc”-address field in the MMS message store.

Test procedure

Create a new MMS by replying to all recipients. Send the message. The MS displays a message that the MMS has been sent. Verify that the message is received by the previous sender and all recipients in the “To”, “Cc”- and “Bcc”-address field.

Expected behaviour

The message is correctly sent and received by all recipients.

43.1.4.3 Forward a received message

Description

Verification that the MS correctly supports the forwarding of a received MMS.

Reason for test

To ensure that the MS correctly supports the forwarding of a received MMS.

Related GSM core specifications

3GPP TS 26.234.

Initial configuration

MS in idle mode, received MMS available in the message store of the MS.

Test procedure

1. Receive a new MMS. Display the message and select the “forwarding” function. Enter a new recipient and send the message. Verify that the message will be received by the recipient and that the MMS is marked as being forwarded.

2. Repeat the test forwarding the message to multiple recipients.

Expected behaviour

The message is correctly forwarded and received by the recipient(s) with the “forwarding marker”.
43.2 MMS Mobile terminated

43.2.1 Mobile terminated with different address format

43.2.1.1 Receive MMS notification with message size indicated

Description
Verification that the MS correctly supports the MMS notification with indicated message size.

Reason for test
To ensure that the MS correctly supports the MMS notification with indicated message size.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode, Auto Download is set to “Off”.

Test procedure
1. Receive a MMS notification of a MMS. The MS shall indicate the MMS notification to the user. Verify that the message size is displayed in the MMS notification. Download the MMS and check whether the real message size of the MMS is the same as it was displayed in the notification.
2. Repeat the test when having received several MMS notifications without downloading the MMSs. Verify that all individual MMS notifications are saved in the MS and that the individual MMS can be downloaded.

Expected behaviour
The Notification(s) are saved in the MS, its/their message size is correctly displayed and the correct MMS is downloaded.

43.2.1.2 Receive message from MSISDN sender using the “To”, the “Cc” or the “Bcc” field

Description
Verification that the MS correctly supports the receiving of a MMS from a MSISDN sender using the “To”, “Cc” or “Bcc” address field.

Reason for test
To ensure that that the MS correctly supports the receiving of a MMS from a MSISDN sender using the “To”, “Cc” or “Bcc” address field.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS from a MS where the “To” address field was used as MSISDN address format. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the sender and the message content is correctly displayed.
2. Repeat the test receiving a MMS from a MS where the “Cc” address field was used as MSISDN address format.
3. Repeat the test receiving a MMS from a MS where the “Bcc” address field was used as MSISDN address format.
Note: If the sender’s MSISDN is stored in the SIM or MS phonebook, the sender’s name should be also displayed.

Expected behaviour
The sender and the message content is correctly displayed.

43.2.1.3 Receive message from email client

Description
Verification that the MS correctly supports the receiving of a MMS from an email client.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS from an email client.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS from an email client. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the sender and the message content is correctly displayed.

Note: If the sender’s e-mail address is stored in the SIM/USIM or MS phonebook, the sender’s name should be also displayed.

Expected behaviour
The sender and the message content is correctly displayed.

43.2.1.4 Receive message to multiple recipients using the fields “To”, “Cc” and “Bcc”

Description
Verification that the MS correctly supports the receiving of a MMS with multiple recipients using the fields “To”, “Cc” and “Bcc”.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS with multiple recipients using the fields “To”, “Cc” and “Bcc”.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS with multiple recipients in which the test recipient is addressed in the “To” address field. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the sender and the message content is correctly displayed.

2. Repeat the test receiving a MMS with multiple recipients in which the test recipient is addressed in the “Cc” address field.

3. Repeat the test receiving a MMS with multiple recipients in which the test recipient is addressed in the “Bcc” address field.

Expected behaviour
The sender and the message content is correctly displayed.
43.2.2 Mobile terminated with different fields and objects

43.2.2.1 Receive message with subject (maximum length)

Description
Verification that the MS correctly supports the receiving of a MMS containing a subject with maximum length.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a subject with maximum length.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing a subject field with maximum length of 40 characters. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the subject field is complete and correctly displayed.

Expected behaviour
The subject field is complete and correctly displayed.

43.2.2.2 Receive message with text (maximum length)

Description
Verification that the MS correctly supports the receiving of a MMS containing a text with maximum length.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a text with maximum length.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing a text field with maximum length of 1000 characters. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the text field is complete and correctly displayed.

Expected behaviour
The text field is complete and correctly displayed.

43.2.2.3 Receive message with sound object (iMelody)

Description
Verification that the MS correctly supports the receiving of a MMS containing an iMelody sound object.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing an iMelody sound object.
Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing an iMelody sound object. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the iMelody sound object is correctly played (i.e. that it is comparable to the sent iMelody) while viewing the MMS. Save the iMelody sound object to the designated data folder of the MS.

Expected behaviour
The iMelody sound object is correctly played and can be saved to the appropriate data folder of the MS.

43.2.2.4 Receive message with polyphonic sound object (MIDI)

Description
Verification that the MS correctly supports the receiving of a MMS containing a MIDI sound object.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a MIDI sound object.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing a MIDI sound object. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the MIDI sound object is correctly played (i.e. that it is comparable to the sent MIDI) while viewing the MMS. Save the MIDI sound object to the designated data folder of the MS.

Expected behaviour
The MIDI sound object is correctly played and can be saved to the appropriate data folder of the MS.

43.2.2.5 Receive message with AMR sound object

Description
Verification that the MS correctly supports the receiving of a MMS containing an AMR sound object.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing an AMR sound object.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing an AMR sound object. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the AMR sound object is correctly played while viewing the MMS. Save the AMR sound object to the designated data folder of the MS.
Expected behaviour
The AMR sound object is correctly played and can be saved to the appropriate data folder of the MS.

43.2.2.6 Receive message with GIF image (different sizes)

Description
Verification that the MS correctly supports the receiving of a MMS containing a GIF image.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a GIF image.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS containing a GIF image. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the GIF image is correctly displayed while viewing the MMS. If the GIF image size is exceeding the screen size the MS shall either show a part of the image and provide a scroll option or fit the image to the display screen. Save the GIF image to the designated data folder of the MS.

2. Repeat this test receiving a MMS with different GIF image sizes.

Expected behaviour
The GIF image is correctly displayed and can be saved to the appropriate data folder of the MS.

43.2.2.7 Receive message with animated GIF image (different sizes)

Description
Verification that the MS correctly supports the receiving of a MMS containing an animated GIF image.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing an animated GIF image.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS containing an animated GIF image. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the animated GIF image is correctly displayed and animated while viewing the MMS. If the animated GIF image size is exceeding the screen size the MS shall either show a part of the image and provide a scroll option or fit the image to the display screen. Save the animated GIF image to the designated data folder of the MS.

2. Repeat this test receiving a MMS with different animated GIF image sizes.

Expected behaviour
The animated GIF image is correctly displayed and animated and can be saved to the appropriate data folder of the MS.
43.2.2.8 Receive message with JPEG image (different sizes)

**Description**
Verification that the MS correctly supports the receiving of a MMS containing a JPEG image.

**Reason for test**
To ensure that the MS correctly supports the receiving of a MMS containing a JPEG image.

**Related GSM core specifications**
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

**Initial configuration**
MS in idle mode.

**Test procedure**
1. Receive a MMS containing a JPEG image. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the JPEG image is correctly displayed while viewing the MMS. If the JPEG image size is exceeding the screen size the MS shall either show a part of the image and provide a scroll option or fit the image to the display screen. Save the JPEG image to the designated data folder of the MS.
2. Repeat this test receiving a MMS with different JPEG image sizes.

**Expected behaviour**
The JPEG image is correctly displayed and can be saved to the appropriate data folder of the MS.

43.2.2.9 Receive message with WBMP image (different sizes)

**Description**
Verification that the MS correctly supports the receiving of a MMS containing a WBMP image.

**Reason for test**
To ensure that the MS correctly supports the receiving of a MMS containing a WBMP image.

**Related GSM core specifications**
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

**Initial configuration**
MS in idle mode.

**Test procedure**
1. Receive a MMS containing a WBMP image. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the WBMP image is correctly displayed while viewing the MMS. If the WBMP image size is exceeding the screen size the MS shall either show a part of the image and provide a scroll option or fit the image to the display screen. Save the WBMP image to the designated data folder of the MS.
2. Repeat this test receiving a MMS with different WBMP image sizes.

**Expected behaviour**
The WBMP image is correctly displayed and can be saved to the appropriate data folder of the MS.

43.2.2.10 Receive message with different objects

**Description**
Verification that the MS correctly supports the receiving of a MMS containing different objects.
Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing different objects.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing at least 2 different text, 2 different picture and 2 different sound objects. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that all objects are correctly available and can be played/displayed while viewing the MMS. Save the objects to their designated data folders of the MS.

Expected behaviour
All objects can be played/displayed and can be saved to the appropriate data folders of the MS.

43.2.2.11 Receive message with Business Card attached

Description
Verification that the MS correctly supports the receiving of a MMS containing a Business Card.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a Business Card.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS with a Business Card attached. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the Business Card is displayed when viewing the MMS. Save the Business Card to the directory of the MS.

Expected behaviour
The Business Card can be displayed and saved to the directory of the MS.

43.2.2.12 Receive message with an appointment attached

Description
Verification that the MS correctly supports the receiving of a MMS containing an appointment.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing an appointment.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.
Test procedure
Receive a MMS containing an appointment. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the appointment is displayed when viewing the MMS. Save the appointment to the organizer of the MS.

Expected behaviour
The appointment can be displayed and saved to the organizer of the MS.

43.2.2.13 Receive message with VNotes attached
Description
Verification that the MS correctly supports the receiving of a MMS containing a VNote.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing a VNote.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode.

Test procedure
Receive a MMS containing a VNote. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the VNote is displayed when viewing the MMS. Save the VNote to the organizer of the MS.

Expected behaviour
The VNote can be displayed and saved to the organizer of the MS.

43.2.2.14 Receive message with different objects from email client
Description
Verification that the MS correctly supports the receiving of a MMS containing different objects from an email client.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS containing different objects from an email client.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS containing a text object from an email client. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the object is played/displayed when viewing the MMS. Save the object(s) to its/their designated data folder(s) of the MS.
2. Repeat the test with a JPEG object
3. Repeat the test with a GIF object
4. Repeat the test with a WBMP object
5. Repeat the test with an AMR sound object
6. Repeat the test with an iMelody object
7. Repeat the test with a MIDI object
8. Repeat the test with multiple pages and different objects.

Expected behaviour
The various objects can be played/displayed and saved to its/their designated data folder(s) of the MS.

43.2.3 Receive MMS with Priorities

43.2.3.1 Receive message with NORMAL Priority

Description
Verification that the MS correctly supports the receiving of a MMS with “normal” priority.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS with “normal” priority.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS with the priority set to “normal”. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the MMS is indicating the priority set to “normal”.
2. Repeat the test receiving the MMS from an email client.

Expected behaviour
The received MMS is indicating the priority set to “normal”.

43.2.3.2 Receive message with LOW Priority

Description
Verification that the MS correctly supports the receiving of a MMS with “low” priority.

Reason for test
To ensure that the MS correctly supports the receiving of a MMS with “low” priority.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS with the priority set to “low”. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the MMS is indicating the priority set to “low”.
2. Repeat the test receiving the MMS from an email client.

Expected behaviour
The received MMS is indicating the priority set to “low”.

43.2.3.3 Receive message with HIGH Priority

Description
Verification that the MS correctly supports the receiving of a MMS with “high” priority.
Reason for test
To ensure that the MS correctly supports the receiving of a MMS with “high” priority.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
1. Receive a MMS with the priority set to “high”. The MS shall indicate the receipt of a new MMS. Open the received message. Verify that the MMS is indicating the priority set to “high”.
2. Repeat the test receiving the MMS from an email client.

Expected behaviour
The received MMS is indicating the priority set to “high”.

43.2.3.4 Receive message with the MS profile “Meeting or silence”

Description
Verification that when the profile “Meeting” or “Silence” is activated in the MS, it shall not automatically play a sound object of a MMS and that the MS shall be mute.

Reason for test
To ensure that when the profile “Meeting” or “Silence” is activated in the MS, it shall not automatically play a sound object of a MMS and that the MS shall be mute.

Related GSM core specifications
3GPP TS 23.140.

Initial configuration
MS in idle mode, profile set to “Meeting” or “Silence”.

Test procedure
Receive a MMS containing a sound object. The MS shall indicate the receipt of a new MMS in silent/meeting mode. Open the received message. Verify that the MS is not automatically playing the sound object of the MMS and that the MS is mute.

Expected behaviour
The MS is not automatically playing the sound object of the MMS.

43.2.4 Auto Download Messages

43.2.4.1 Receive MMS when Auto Download is set to “Off“ / Reject MMS

Description
Verification that when Auto Download is set to “Off” in the MS, it shall be possible to reject the receiving of the MMS. The MS shall not automatically download the MMS.

Reason for test
To ensure that when Auto Download is set to “Off” in the MS, it shall be possible to reject the receiving of the MMS. The MS shall not automatically download the MMS.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “off”.
Test procedure
Receive a MMS notification of a MMS. The MS shall indicate the MMS notification to the user. Verify that the MS is not automatically downloading the MMS. Reject the receiving of the MMS. Verify that the MS sends a M_Notify_Resp with X-MMS-Status set to "reject" to the network. Verify that the MS does not send a new notification for this message to the user.

Expected behaviour
The MS is not automatically downloading the MMS. On reject by the user, the MS sends a M_Notify_Resp with X-MMS-Status set to "reject" to the network. The MS does not send a new notification for this message to the user.

43.2.4.2 Receive MMS when Auto Download is set to “Confirm”

Description
Verification that when Auto Download is set to “Confirm” in the MS, it shall be possible to defer the receiving of the MMS.

Reason for test
To ensure that when Auto Download is set to “Confirm” in the MS, it shall be possible to defer the receiving of the MMS.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “Confirm”.

Test procedure
Receive a MMS notification of a MMS. The MS shall indicate the MMS notification to the user. Verify that the MS is not automatically downloading the MMS. Defer the receiving of the MMS. Verify that the MS sends a “defer” message to the network. Download the deferred message from the server. Open the message and verify that the downloaded message is exactly the one which was previously deferred.

Expected behaviour
The MS is not automatically downloading the MMS. On defer by the user, the MS sends a “defer” message to the network. On downloading, the MS receives exactly the MMS which was previously deferred.

43.2.4.3 Receive MMS when Auto Download is set to “On”

Description
Verification that when Auto Download is set to “On” in the MS, the MMS is automatically downloaded by the MS.

Reason for test
To ensure that when Auto Download is set to “On” in the MS, the MMS is automatically downloaded by the MS.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “On”.

Test procedure
Receive a MMS notification of a MMS. The MS shall indicate the MMS notification to the user. Verify that the MS is automatically downloading the MMS and after receipt, the message can be displayed by the user.
Expected behaviour
The MS is automatically downloading the MMS. After receipt, the message can be displayed by the user.

43.2.4.4 Receive MMS when Auto Download is set to “On” and the MS memory is full

Description
Verification that when Auto Download is set to “On” in the MS and the MS memory is full, the download of the MMS is automatically deferred by the MS and an appropriate notification is given to the user.

Reason for test
To ensure that when Auto Download is set to “On” in the MS and the MS memory is full, the download of the MMS is automatically deferred by the MS and an appropriate notification is given to the user.

Related GSM core specifications
None.

Initial configuration
MS in idle mode, Auto Download is set to “On”, MMS memory of the MS is full.

Test procedure
Receive a MMS notification of a MMS. The MS shall indicate that a new MMS is available to the user but that there is not enough memory in the MS to receive the message. Verify that the MS sends a “defer” message to the network. Clear the memory of the MS, then download the deferred message from the server. Open the message and verify that the downloaded message is exactly the one which was previously deferred.

Expected behaviour
The MS is indicating to the user that its MMS memory is full. The MS sends a “defer” message to the network. On downloading, the MS receives exactly the MMS which was previously deferred.

43.2.4.5 Receive MMS when Auto Download is set to “On” and the sender is anonymous

Description
Verification that when Auto Download is set to “On” in the MS and the sender is anonymous, it is possible to deny the MMS.

Reason for test
To ensure that when Auto Download is set to “On” in the MS and the sender is anonymous, it is possible to deny the MMS.

Related GSM core specifications
None.

Initial configuration
MS in idle mode, Auto Download is set to “On”, Receive option is set to “Deny message when anonymous sender”.

Test procedure
Receive a MMS notification of a MMS. The MS shall indicate that a new MMS is available to the user but that the sender is anonymous. Verify that the MS is not automatically downloading the MMS.

Expected behaviour
The MS is not automatically downloading the MMS.
43.2.4.6  Receive MMS when Auto Download is set to “Off”

Description
Verification that when Auto Download is set to “Off” in the MS, it is possible to download the MMS at a later time.

Reason for test
To ensure that when Auto Download is set to “Off” in the MS, it is possible to download the MMS at a later time.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “Off”.

Test procedure
Receive a MMS notification of a MMS. The MS shall indicate that a new MMS is available to the user. Verify that the MS is not automatically downloading the MMS but sending a defer message to the network. Download the deferred message from the server. Open the message and verify that the downloaded message is exactly the one which was previously deferred.

Expected behaviour
The MS is not automatically downloading the MMS. On receipt of the MMS notification, the MS sends a “defer” message to the network. On downloading, the MS receives exactly the MMS which was previously deferred.

43.3  Message Reports

43.3.1  Messages with Delivery Report

43.3.1.1  Send MMS with Delivery Report set to “On”

Description
Verification that the MS correctly supports indicating the Delivery Report request to the network.

Reason for test
To ensure that that the MS correctly supports indicating the Delivery Report request to the network.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new MMS. Send the message using an MSISDN in national format. The MS displays a message that the MMS has been sent. Ensure that the recipient has successfully received the MMS. Verify that the Delivery Report is sent back to the sender of the MMS. Verify that the MS correctly displays the Delivery Report.

Expected behaviour
The MS is correctly displaying the Delivery Report.

43.3.1.2  Send MMS with Delivery Report set to “Off”

Description
Verification that the MS correctly supports indicating the Delivery Report request to the network.
Reason for test
To ensure that the MS correctly supports indicating the Delivery Report request to the network.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “Off” in the MS.

Test procedure
Create a new MMS. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient has successfully received the MMS. Verify that no Delivery Report is sent back to the sender of the MMS.

Expected behaviour
The MS is not receiving a Delivery Report.

43.3.1.3 Receive a Delivery Report when the MMS was retrieved / Successful

Description
Verification that the MS correctly supports the receipt of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the receipt of the MMS Delivery Report.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new MMS. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient has successfully received the MMS. Verify that the Delivery Report is received by the sender of the MMS. Verify that the MS correctly indicates the status of the sent message as “delivered”.

Expected behaviour
The MS is displaying the delivery status of the sent message as “delivered”.

43.3.1.4 Receive a Delivery Report when the MMS was rejected

Description
Verification that the MS correctly supports the receipt of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the receipt of the MMS Delivery Report.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new MMS. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient rejects the MMS. Verify that the Delivery Report is received by the sender of the MMS. Verify that the MS correctly indicates the status of the sent message as “rejected”.

Expected behaviour
The MS is displaying the delivery status of the sent message as "rejected".

43.3.1.5 Receive a Delivery Report were the MMS was expired

Description
Verification that the MS correctly supports the receipt of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the receipt of the MMS Delivery Report.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new MMS. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient does not receive the MMS and that the MMS delivery timer expires. Verify that then the Delivery Report is received by the sender of the MMS. Verify that the MS correctly indicates the status of the sent message as "Timer expired".

Expected behaviour
The MS is displaying the delivery status of the sent message as “Timer expired”.

43.3.1.6 Receive a Delivery Report when the MMS was sent to multiple recipients

Description
Verification that the MS correctly supports the receipt of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the receipt of the MMS Delivery Report.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new MMS to multiple recipients. Send the message. The MS displays a message that the MMS has been sent. Ensure that some recipients reject, defer or retrieve the message. Verify that for each recipient the Delivery Report is received by the sender of the MMS. Verify that the MS correctly indicates the various states of the sent message.

Expected behaviour
The MS is correctly displaying the various delivery states of the sent message.

43.3.1.7 Receive a Delivery Report when the recipient MSISDN is directly forwarded to a different MSISDN

Description
Verification that the MS correctly supports the receipt of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the receipt of the MMS Delivery Report.
Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery Report is set to “On” in the MS, Recipient has enabled “Directly Forwarding” to another MSISDN.

Test procedure
Create a new MMS to multiple recipients. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient has retrieved the MMS from the forwarded MSISDN. Verify that the Delivery Report is received by the sender of the MMS. Verify that the MS correctly indicates the status of the sent message as “delivered”.

Expected behaviour
The MS is displaying the delivery status of the sent message as “delivered”.

43.3.1.8 Deny Delivery Report

Description
Verification that the MS correctly supports the deny of the MMS Delivery Report.

Reason for test
To ensure that the MS correctly supports the deny of the MMS Delivery Report.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Delivery report is set to “On” in the sending MS, Deny Delivery Report is set to “on” in the retrieving MS.

Test procedure
Retrieve a MMS and verify that the sending MS will not receive a Delivery Report.

Expected behaviour
The retrieving MS is denying the Delivery Report and the sending MS is not receiving a Delivery Report.

43.3.2 Message with Read Reply Report

43.3.2.1 Sending a Message with Read Reply set to “On”

Description
Verification that the MS correctly supports indicating the Read Reply Report request to the network.

Reason for test
To ensure that that the MS correctly supports indicating the Read Reply Report request to the network.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Read Reply Report is set to “On” in the MS.

Test procedure
Create a new MMS. Send the message to an MSISDN in national format. The MS displays a message that the MMS has been sent. Ensure that the recipient has successfully received the MMS. When the
recipient has read the message, verify that the Read Reply Report is sent back to the sender of the MMS. Verify that the MS correctly displays the Read Reply Report.

**Expected behaviour**
The MS is correctly sending the Read Reply Report request.

### 43.3.2.2 Sending a Message with Read Reply set to “Off”

**Description**
Verification that the MS correctly supports indicating the Read Reply Report request to the network.

**Reason for test**
To ensure that that the MS correctly supports indicating the Read Reply Report request to the network.

**Related GSM core specifications**
3GPP TS 26.234.

**Initial configuration**
MS in idle mode, Read Reply Report is set to “Off” in the MS.

**Test procedure**
Create a new MMS. Send the message. The MS displays a message that the MMS has been sent. Ensure that the recipient has successfully received the MMS. When the recipient has read the message, verify that no Read Reply Report is sent back to the sender of the MMS.

**Expected behaviour**
The MS is not sending a Read Reply Report request.

### 43.3.2.3 Receiving a Message with Read Reply to single recipient

**Description**
Verification that the recipient will receive the Read Reply Report set to “On”, and that the receiving MS sends the correct Read Reply Confirmation back to the sending MS.

**Reason for test**
To ensure that the recipient will receive the Read Reply Report set to “On”, and that the receiving MS sends the correct Read Reply Confirmation back to the sending MS.

**Related GSM core specifications**
3GPP TS 26.234.

**Initial configuration**
MS in idle mode, Read Reply Report is set to “On” in the sending MS.

**Test procedure**
1. Receive a MMS in which the Read Reply Report is set to “On”. Verify that the recipient is asked to send the Read Reply after viewing the MMS. Confirm with “yes” and verify that the sender receives the Read Reply Report.
2. Repeat the test with the receiver pressing “No” when asked to send the Read Reply. Verify that the sending terminal will not receive the Read Reply Report.

**Expected behaviour**
The MS is correctly sending the Read Reply Report Confirmation.
43.3.2.4 Receiving a Message with Read Reply to multiple recipients

Description
Verification that all recipients will receive the Read Reply Report set to “On”, and that the receiving MSs send the correct Read Reply Confirmation back to the sending MS.

Reason for test
To ensure that all recipients will receive the Read Reply Report set to “On”, and that the receiving MSs send the correct Read Reply Confirmation back to the sending MS.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Read Reply Report is set to “On” in the sending MS.

Test procedure
1. Receive a MMS in which the Read Reply Report is set to “On” and sent to multiple recipients. Verify that all recipients are asked to send the Read Reply after viewing the MMS. Confirm with “yes” and verify that the sender receives the Read Reply Reports from each recipient.
2. Repeat the test with some of the receivers pressing “No” when asked to send the Read Reply. Verify that the sending terminal will only receive the Read Reply Reports from the recipients who have agreed to send the Read Reply Report.

Expected behaviour
The sending MS is correctly receiving the Read Reply Reports.

43.3.2.5 Receive a Read Reply Report when the recipient MSISDN is directly forwarded to a different MSISDN

Description
Verification that the MS correctly supports the sending and receipt of the Read Reply Report when the recipient MSISDN is directly forwarded to a different MSISDN.

Reason for test
To ensure that the MS correctly supports the sending and receipt of the Read Reply Report when the recipient MSISDN is directly forwarded to a different MSISDN.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Read Reply Report is set to “On” in the sending MS, Recipient MSISDN is directly forwarded to a different MSISDN.

Test procedure
Send a MMS and set the Read Reply Report to “On”. Forward the recipient MSISDN address to another MSISDN address. Receive the MMS at the forwarded MSISDN and verify that it is possible to send the Read Reply Report and that the sender will receive this report.

Expected behaviour
The recipient can send a Read Reply Report and the sending MS is correctly receiving this report.

43.4 Message attributes

43.4.1 Sending messages with validity period

Description
Verification that the MS correctly supports the sending of the MMS Validity Period to the network.
Reason for test
To ensure that the MS correctly supports the sending of the MMS Validity Period to the network.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
Send a MMS with different validity periods (e.g. 1 hour, 12 hours, 1 day, 1 week, maximum). Verify that the MMS contains the right settings for the validity period and let the validity period expire. Verify that it shall not be possible to retrieve the message after the expired period.

Note: The correct function of this feature can also be checked by using the MMS Delivery Report (timer expiry due to receiving MS not reachable).

Expected behaviour
The MS is sending the correct values for the MMS Validity Period to the network.

43.4.2 Sending messages with delayed delivery

Description
Verification that the MS correctly supports the sending of the MMS with delayed delivery to the network, if this feature is supported.

Reason for test
To ensure that the MS correctly supports the sending of the MMS with delayed delivery to the network if this feature is supported.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
Send a MMS with different delayed delivery values (e.g. 1 hour, 12 hours,…). Verify that the message is received by the recipient after the period has expired.

Expected behaviour
The MMS is received by the recipient after the delayed delivery time has expired.

43.4.3 Receiving MMS with Message Classes

43.4.3.1 Receiving messages with Message Class “Personal“

Description
Verification that the MS correctly supports the appropriate Message Class of the received MMS.

Reason for test
To ensure that the MS correctly supports the appropriate Message Class of the received MMS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.
Test procedure
Receive a message with Message Class “Personal”, Read Reply Request and Delivery Report request are set to “On”. Verify that the Message Class in the MMS notification is “Personal”. Verify that a Read Reply Report can be generated for this message, that the message can be replied and that a Delivery Report can be generated for this message.

Expected behaviour
The MS displays the Message Class “Personal”. The MS is able to generate a Read Reply Report for this message, the message can be replied and a Delivery Report can be generated for this message.

43.4.3.2 Receiving messages with Message Class “Advertisement“

Description
Verification that the MS correctly supports the appropriate Message Class of the received MMS.

Reason for test
To ensure that the MS correctly supports the appropriate Message Class of the received MMS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
Receive a message with Message Class “Advertisement”. Verify that the Message Class in the MMS notification is “Advertisement”. Verify that no Read Reply Report can be generated for this message, that the message cannot be replied and that no Delivery Report can be generated for this message.

Note: It is required to generate a MMS with this Message Class in the MMS server, since no MS can generate such a message.

Expected behaviour
The MS displays the Message Class “Advertisement“. The MS is not able to generate a Read Reply Report for this message, the message cannot be replied and no Delivery Report can be generated for this message.

43.4.3.3 Receiving messages with Message Class “Informational“

Description
Verification that the MS correctly supports the appropriate Message Class of the received MMS.

Reason for test
To ensure that the MS correctly supports the appropriate Message Class of the received MMS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
Receive a message with Message Class “Informational”. Verify that the Message Class in the MMS notification is “Informational”. Verify that no Read Reply Report can be generated for this message, that the message cannot be replied and that no Delivery Report can be generated for this message.

Note: It is required to generate a MMS with this Message Class in the MMS server, since no MS can generate such a message.
Expected behaviour
The MS displays the Message Class “Informational”. The MS is not able to generate a Read Reply Report for this message, the message cannot be replied and no Delivery Report can be generated for this message.

43.4.3.4 Receiving messages with Message Class “Auto”

Description
Verification that the MS correctly supports the appropriate Message Class of the received MMS.

Reason for test
To ensure that the MS correctly supports the appropriate Message Class of the received MMS.

Related GSM core specifications
WAP-209-MMS Encapsulation-20020105-a.

Initial configuration
MS in idle mode.

Test procedure
Receive a message with Message Class “Auto”. Verify that the Message Class in the MMS notification is “Auto”. Verify that no Read Reply Report can be generated for this message, that the message cannot be replied and that no Delivery Report can be generated for this message.

Note: It is required to generate a MMS with this Message Class in the MMS server, since no MS can generate such a message. In this case, a Read Reply would be an appropriate “Auto” message.

Expected behaviour
The MS displays the Message Class “Auto”. The MS is not able to generate a Read Reply Report for this message, the message cannot be replied and no Delivery Report can be generated for this message.

43.5 MMS error handling and multitask interactions

43.5.1 Error handling for sending and receiving MMS

43.5.1.1 Cancel the downloading MMS when Auto Download is set to “On”

Description
Verification that it is possible to cancel the download session for MMS without losing the MMS notification.

Reason for test
To ensure that it is possible to cancel the download session for MMS without losing the MMS notification.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “On”.

Test procedure
Receive a MMS and verify that the Auto Download is set to “On”. Receive the MMS notification. While the MMS is downloading, cancel the download session. Verify that the MMS notification is still available and that it is possible to download the MMS again.
Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

43.5.1.2 Cancel the downloading MMS when Auto Download is set to “Off”

Description
Verification that it is possible to cancel the download session for MMS without losing the MMS notification.

Reason for test
To ensure that it is possible to cancel the download session for MMS without losing the MMS notification.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “Off”.

Test procedure
Receive a MMS and verify that the Auto Download is set to “Off”. Receive the MMS notification. Start downloading the MMS. While the MMS is downloading, cancel the download session. Verify that the MMS notification is still available and that it is possible to download the MMS again.

Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

43.5.1.3 Cancel the downloading MMS when Auto Download is set to “Confirm”

Description
Verification that it is possible to cancel the download session for MMS without losing the MMS notification.

Reason for test
To ensure that it is possible to cancel the download session for MMS without losing the MMS notification.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “Confirm”.

Test procedure
Receive a MMS and verify that the Auto Download is set to “Confirm”. Receive the MMS notification and confirm downloading the MMS. While the MMS is downloading, cancel the download session. Verify that the MMS notification is still available and that it is possible to download the MMS again.

Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

43.5.1.4 Abort the transmission when sending a message

Description
Verification that it is possible to cancel the upload session for MMS without losing the MMS to be sent.

Reason for test
To ensure that it is possible to cancel the upload session for MMS without losing the MMS to be sent.
43.5.1.5  Loss of coverage while sending a MMS

Description
Verification that after losing coverage while uploading a MMS, the message is still available.

Reason for test
To ensure that after losing coverage while uploading a MMS, the message is still available.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, MMS to be sent is in the outbox.

Test procedure
Send a MMS. While the MMS is transmitted, enter in an area without coverage. Verify that the MMS to be sent is still available in the sender’s MS and that the recipient did not receive the incomplete MMS.

Expected behaviour
The MMS is still available in the sender’s MS and recipient does not receive an incomplete MMS.

43.5.1.6  Maximum message size exceeded when sending a MMS

Description
Verification that the sending terminal displays an error message when the maximum message size which is restricted by the MMSC is exceeded.

Reason for test
To ensure that the sending terminal displays an error message when the maximum message size which is restricted by the MMSC is exceeded.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, picture and sound objects available in the data folder of the MS.

Test procedure
Create a new MMS and add so many picture and sound objects that the maximum message size will be exceeded. Try to send the message. The MMSC sends an error message that the maximum message size is exceeded. Verify that the MS interprets the error message correctly and that it displays that the maximum message size is exceed.

Note: The maximum message size supported by the MMSC may vary depending on its configuration. Usually the maximum message size is set to 30 kByte)
Expected behaviour
The MS interprets the error message correctly and it displays that the maximum message size is exceeded.

43.5.1.7 Send a MMS to a MSISDN which is not subscribed to the MMS service

Description
Verification that the sending terminal displays an error message when a MMS is sent to a MSISDN which is not subscribed to the MMS service.

Reason for test
To ensure that the sending terminal displays an error message when a MMS is sent to a MSISDN which is not subscribed to the MMS service.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode.

Test procedure
Create a new MMS and try to send the message to a MSISDN which is not subscribed to the MMS service. The MMSC sends an error message that the recipient is not subscribed to the MMS service. Verify that the MS interprets the error message correctly and that it displays that the recipient is not subscribed to the MMS service.

Expected behaviour
The MS interprets the error message correctly and it displays that the recipient is not subscribed to the MMS service.

43.5.1.8 Send MMS when MS is out of coverage

Description
Verification that the MS behaves correctly on MMS sending when the MS is out of coverage.

Reason for test
To ensure that the MS behaves correctly on MMS sending when the MS is out of coverage.

Related GSM core specifications
None.

Initial configuration
MS out of network coverage.

Test procedure
Create a new MMS and try to send the message when the MS is out of coverage. Verify that the MS displays an error message indicating that it is out of network coverage and that the MS saves the message to its memory. As soon as the MS returns to idle mode it shall either send the MMS automatically or that it is possible to send the message again manually.

Expected behaviour
When regaining network coverage, the MS either sends the MMS automatically or it is possible to send the message again manually.
43.5.2 MMS multitask interactions

43.5.2.1 Incoming Voice Call during downloading MMS

Description
Verification that it is possible to receive a Voice Call during the download session for MMS without losing the MMS Notification.

Reason for test
To ensure that it is possible to receive a Voice Call during the download session for MMS without losing the MMS Notification.

Related GSM core specifications
3GPP TS 23.140.

Initial configuration
MS in idle mode. Incoming CS calls during active GPRS session supported by the network.

Test procedure
Receive a MMS and start to download the message. During the download session receive an incoming Voice Call. Answer the call. The download session shall be interrupted. End the call and verify that the MMS notification is still available and that it is possible to download the MMS again.

Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

43.5.2.2 Incoming CS Short Message during downloading MMS

Description
Verification that it is possible to receive a Short Message (CS mode) during the download session for MMS without losing the MMS Notification.

Reason for test
To ensure that it is possible to receive a Short Message (CS mode) during the download session for MMS without losing the MMS Notification.

Related GSM core specifications
3GPP TS 23.140.

Initial configuration
MS in idle mode. Incoming Short Message (CS) during active GPRS session supported by the network.

Test procedure
Receive a MMS and start to download the message. During the download session receive Short Message on the CS channel. Read the Short Message. The download session shall be interrupted. Verify that the MMS notification is still available and that it is possible to download the MMS again.

Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

43.5.2.3 Incoming MMS during an active call

Description
Verification that it is possible to receive a MMS Notification during an active call.

Reason for test
To ensure that it is possible to receive a MMS Notification during an active call.
Related GSM core specifications
3GPP TS 23.140.
3GPP TS 26.110 et TS 26.111

Initial configuration
DUT is in Idle mode.

Test procedure
Scenario A: Voice Call
1. Make MO Voice call to Client 1.
2. Receive MT MMS.
3. End Voice call.
4. Check MMS

Scenario B: Video Call
1. Make MO Video call to Client 1.
2. Receive MT MMS.
3. End Video call.
4. Check MMS

Scenario C: CS Data Call
1. Make MO CS Data call to Client 1.
2. Receive MT MMS.
3. End CS Data call.
4. Check MMS

Expected behaviour
1. Call is successfully setup.
2. Notification of the incoming MMS is received but does not disturb the call.
3. The call is successfully ended.
4. MMS is received correctly.

43.5.2.4 Receiving a MMS during an active WAP Session

Description
Verification that it is possible to receive a MMS Notification during an active call.

Reason for test
To ensure that it is possible to receive a MMS Notification during an active call.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in a WAP session.

Test procedure
Start a WAP session. While the WAP session is active, receive a MMS. The MS shall save the MMS notification while the WAP session is still active. Then check the MMS Notification and start to download the new MMS. The MS shall close the active WAP session and start to connect to the MMSC to download the message. Verify that the MMS is completely downloaded.
Expected behaviour
The MMS notification is still available and it is possible to download the complete MMS.

43.5.2.5 Receiving MMS and select "Call to Sender" from the menu

Description
Verification that it is possible to select "Call to Sender" from the menu when receiving a MMS.

Reason for test
To ensure that it is possible to select "Call to Sender" from the menu when receiving a MMS.

Related GSM core specifications
3GPP TS 23.140.

Initial configuration
MS in idle mode.

Test procedure
Receive a new MMS. Open the message. When the MMS is displayed, select "Call to Sender". Verify that the correct number is dialled and connected.

Expected behaviour
The Sender's number is correctly dialled and connected.

43.6 SMIL functions and options

43.6.1 SMIL function when sending a MMS

43.6.1.1 Maximum message size when sending a MMS

Description
Verification that the maximum message size which is set by the MMSC will be supported by the client.

Reason for test
To ensure that the maximum message size which is set by the MMSC will be supported by the client.

Related GSM core specifications
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, picture and sound objects available in the data folder of the MS.

Test procedure
Create a new MMS and add so many picture and sound objects that the maximum message size will be reached but not exceeded. Send the message. The MS displays a message that the MMS has been sent. Verify that the recipient receives the complete message with all objects included.

Note: The maximum message size supported by the MMSC may vary depending on its configuration. Usually the maximum message size is set to 30 kByte)

Expected behaviour
The MMS is correctly sent and the recipient receives the complete message with all objects included.

43.6.1.2 Preview the message size when sending a MMS

Description
Verification that the MMS and its correct message size can be viewed before sending the MMS.
Reason for test
To ensure that the MMS and its correct message size can be viewed before sending the MMS.

Related GSM core specifications
None.

Initial configuration
MS in idle mode.

Test procedure
Create a new MMS. Then preview the completed MMS. Before sending the MMS the correct message size shall be visible. Send the message. The MS displays a message that the MMS has been sent. Verify that the recipient receives the complete message and that the MMS looks like the previewed one.

Expected behaviour
The MMS can be previewed. The MS displays the correct message size before sending the message. The recipient receives the complete message and the MMS looks like the previewed one.

43.6.1.3  Send a MMS with multiple pages

Description
Verification that the MS correctly supports sending a MMS with multiple pages.

Reason for test
To ensure that the MS correctly supports sending a MMS with multiple pages.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.

Initial configuration
MS in idle mode, picture and sound objects available in the data folder of the MS.

Test procedure
Create a new MMS with multiple pages. The first page shall contain 1 sound, 1 picture and 1 text object. The second and third page should contain a different sound, picture and text object. Verify that the page timing between the pages can be set and/or changed. Send the message. The MS displays a message that the MMS has been sent. Verify that the MMS is correctly received by the recipient and that it looks like the composed message.

Expected behaviour
A MMS with multiple pages can be created. The page timing between the pages can be set and/or changed. The MMS is correctly received by recipient and it looks like the composed message.

43.6.2  SMIL function when receiving a MMS

43.6.2.1  Receive a MMS with multiple pages

Description
Verification that the MS correctly supports receiving a MMS with multiple pages.

Reason for test
To ensure that the MS correctly supports receiving a MMS with multiple pages.

Related GSM core specifications
3GPP TS 26.234
MMS Conformance Document Version 2.0.0.
Initial configuration
MS in idle mode.

Test procedure
Receive a MMS with multiple pages. The first page shall contain 1 sound, 1 picture and 1 text object. The second and third page should contain a different sound, picture and text object. View the message. Verify that the individual page timing between the pages is correct. Verify that the MMS is correctly received by the recipient and that it looks like the composed message.

Expected behaviour
The page timing between the pages is as it was composed. The MMS is correctly received and displayed by recipient and it looks like the composed message.

43.7 MMS Handling

43.7.1 Handling of MMS Notification when changing the SIM
Description
Verification that the MS is correctly handling the MMS notification when the SIM was changed.

Reason for test
To ensure that the MS is correctly handling the MMS notification when the SIM was changed.

Related GSM core specifications
3GPP TS 26.234.

Initial configuration
MS in idle mode, Auto Download is set to “Off”.

Test procedure
Receive a MMS when the Auto Download is set to “Off”. Verify that the MMS notification is received and stored in the MS. Switch the MS off and change the SIM. Switch the MS on with the new SIM and check the MMS inbox. If the received MMS notification is still there, try to download the MMS. It shall not be possible to download the MMS.

Expected behaviour
It shall not be possible to download the MMS.

44 Browsing

44.1 WAP 1.X

44.1.1 Dial in

44.1.1.1 Dial in to busy RAS
Description
Check that the MS correctly indicates when the RAS is busy

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly indicates that the RAS is busy, and automatically redials if configured to do so.
Initial configuration
MS in idle mode

Note A busy RAS could be simulated by with another telephone which is busy).

Test procedure
Attempt a WAP call to a busy RAS. Check the behaviour of the MS

Expected behaviour
The MS shall indicate that the RAS is busy, and shall redial if configured to do so.

44.1.1.2 Dial in to invalid number
Description
Check that the MS correctly indicates that an invalid number has been dialled

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly indicates that an invalid number has been dialled

Initial configuration
MS in idle mode

Test procedure
Attempt a WAP call to an invalid number. Check the behaviour of the MS

Expected behaviour
The MS shall indicate that an invalid number has been dialled.

44.1.1.3 Dial in to analogue RAS (setting: ISDN)
Description
Ensure that when dialling an analogue RAS that a connection is successfully made

Related 3GPP core specifications
None

Reason for test
To ensure that a connection is successfully made when dialling an analogue RAS

Initial configuration
MS in idle mode

Test procedure
Attempt a WAP call to an analogue RAS. Check when the connection is successful

Expected behaviour
The connection shall be made and allow data to be exchanged

44.1.1.4 Dial in to PSTN telephone number
Description
Check that the MS correctly indicates a failed call and clears the call when a PSTN telephone number is dialled.

Related 3GPP core specifications
None
Reason for test
To ensure the MS correctly indicates a failed call and clears the call when a PSTN telephone number is dialled.

Initial configuration
MS in idle mode

Test procedure
Attempt a WAP call to a PSTN telephone number. Check the behaviour of the MS

Expected behaviour
The MS shall indicate that the call has failed and clear the call.

### 44.1.1.5 Dial in to FAX

**Description**
Check that the MS correctly indicates a failed call and clears the call when a PSTN fax number is dialled.

**Related 3GPP core specifications**
None

**Reason for test**
To ensure the MS correctly indicates a failed call and clears the call when a PSTN fax number is dialled.

**Initial configuration**
MS in idle mode

**Test procedure**
Attempt a WAP call to a PSTN fax number. Check the behaviour of the MS

**Expected behaviour**
The MS shall indicate that the call has failed and clear the call.

### 44.1.1.6 Dial in to GSM-Voice

**Description**
Check that the MS correctly indicates a failed call and clears the call when a GSM voice number is dialled.

**Related 3GPP core specifications**
None

**Reason for test**
To ensure the MS correctly indicates a failed call and clears the call when a GSM voice number is dialled.

**Initial configuration**
MS in idle mode

**Test procedure**
Attempt a dial in WAP call to a GSM voice number. Check the behaviour of the MS

**Expected behaviour**
The MS shall indicate that the call has failed and clear the call.
44.1.1.7 Dial in to GSM-Fax

Description
Check that the MS correctly indicates a failed call and clears the call when a GSM fax number is dialled.

Related 3GPP core specifications
None

Reason for test
To ensure the MS correctly indicates a failed call and clears the call when a GSM fax number is dialled.

Initial configuration
MS in idle mode

Test procedure
Attempt a dial in WAP call to a GSM fax number. Check the behaviour of the MS

Expected behaviour
The MS shall indicate that the call has failed and clear the call.

44.1.1.8 Wrong data rate (e.g. 14400, when 9600 supported)

Description
Check that the MS correctly indicates a failed call and clears the call when the MS is configured to attempt a call at a greater rate than the RAS supports. e.g. 14400 when the RAS can only support 9600.

Related 3GPP core specifications
None

Reason for test
To ensure the MS correctly indicates a failed call and clears the call when the MS is configured to attempt a call at a greater rate than the RAS supports.

Initial configuration
MS in idle mode, configured to make a WAP call at high data rate.

Test procedure
 Attempt a dial in WAP call to the RAS. Check the behaviour of the MS

Expected behaviour
The MS shall indicate that the call has failed and clear the call.

44.1.1.9 Dial in with Prepaid SIM Card: network call termination

Description
Check that the MS successfully makes a WAP dial in call when it is equipped with a prepaid SIM card with credit remaining.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS successfully makes a WAP dial in call when it is equipped with a prepaid SIM card with small credit remaining

Initial configuration
MS in idle mode
Test procedure
Attempt a dial in WAP call to the RAS. Wait until the credit expires and the network terminates the call. Check the behaviour of the MS

Expected behaviour
The MS shall successfully complete the call and exchange data with the RAS. The appropriate call charge shall have been made against the credit balance.

When the call is terminated by the network, the handset shall indicate that the call has ended and clear the call.

44.1.1.10 Dial in with AOC (WAP call charged)

Description
Check that the MS successfully makes a WAP dial in call when AoCC is activated with credit remaining.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS successfully makes a WAP dial in call when AoCC is activated with credit remaining

Initial configuration
MS in idle mode

Test procedure
Attempt a dial in WAP call to the RAS. Check the behaviour of the MS

Expected behaviour
The MS shall successfully complete the call and exchange data with the RAS. The appropriate call charge shall have been made against the credit balance.

44.1.1.11 Dial in with activated FDN – authorised number

Description
When FDN is activated, check that the MS successfully makes a WAP call to a valid FDN.

Related 3GPP core specifications
None

Reason for test
To ensure that when FDN is activated, the MS successfully makes a WAP call to an number authorised by the FDN list.

Initial configuration
MS in idle mode, FDN activated, the number for the RAS is authorised by FDN

Test procedure
Attempt a dial in WAP call to the RAS. Check the behaviour of the MS

Expected behaviour
The MS shall successfully complete the call and exchange data with the RAS.

44.1.1.12 Dial in with activated FDN – non authorised number

Description
When FDN is activated, check that the MS is unable to make a WAP call when the number is not authorised by FDN.
Related 3GPP core specifications
None

Reason for test
To ensure that when FDN is activated, the MS is unable to make a WAP call when the RAS number is not authorised by FDN.

Initial configuration
MS in idle mode, FDN activated, the number for the RAS is not authorised by FDN.

Test procedure
Attempt a dial in WAP call to the RAS. Check the behaviour of the MS.

Expected behaviour
The MS shall indicate that the call could not be set up.

44.1.2 Access Settings

44.1.2.1 Wrong IP-Address

Note: This test case applies when the secondary IP address is not used. This test case should be repeated using primary and secondary address, and should check the fallback from primary to secondary.

Description
Check that the MS indicates that a connection cannot be made if the wrong Gateway IP address is entered.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS indicates that a connection cannot be made if the wrong Gateway IP address is entered.

Initial configuration
MS in idle mode, incorrect IP address configured for the WAP gateway

Test procedure
Using MMI commands, attempt to make a WAP connection. Check the behaviour of the MS.

Expected behaviour
The MS shall indicate that no connection is possible, indicating the correct reason for the failure, and shall clear the call.

44.1.2.2 User field empty

Description
Check that the MS indicates that a connection cannot be made if the User field is empty.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS indicates that a connection cannot be made if the User field is empty.

Initial configuration
MS in idle mode. No data listed in the User field for WAP access.
Test procedure
Using MMI commands, attempt to make a WAP connection. Check the behaviour of the MS.

Expected behaviour
The MS shall indicate that no connection is possible, indicating the correct reason for the failure, and shall clear the call.

44.1.2.3 Password field empty

Description
Check that the MS indicates that a connection cannot be made if the Password field is empty.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS indicates that a connection cannot be made if the Password field is empty.

Initial configuration
MS in idle mode, no data listed in the Password field for WAP access, network configured to require user name and password authentication.

Test procedure
Using MMI commands, attempt to make a WAP connection. Check the behaviour of the MS.

Expected behaviour
The MS shall indicate that no connection is possible, indicating the correct reason for the failure, and shall clear the call.

44.1.3 Security

44.1.3.1 Display message while setting up a WTLS connection

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays a suitable message while WTLS handshake is occurring.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays a suitable message while WTLS handshake is occurring.

Initial configuration
MS in idle mode.

Test procedure
Set up a WAP connection, and make contact with a site that requires WTLS encryption. Check that the WTLS handshake is proceeding.

Expected behaviour
While the WTLS handshake is proceeding, the MS shall display a suitable message. Once the handshake is complete, the MS shall display the page.
44.1.4 Browser

44.1.4.1 Display of Browser version

Description
Ensure that the browser can display its version

Related 3GPP core specifications
None

Reason for test
To ensure that the browser can display its version

Initial configuration
MS in idle mode

Test procedure
Using the MMI, enter the command to display the browser version

Expected behaviour
The correct browser version shall be displayed

44.1.4.2 Menu

Description
Ensure that the menu options all work as designed

Related 3GPP core specifications
None

Reason for test
To ensure that all the menu options work as designed

Initial configuration
MS in a WAP session, a full detailed menu description shall be available

Test procedure
Using the MMI (including soft keys), exercise each of the menu options in turn, check whether the MS behaves as intended, according to the menu specification

Expected behaviour
MS behaves according to the description of each menu item

44.1.4.3 Back option

Description
Ensure that the option to return to a previous page works

Related 3GPP core specifications
None

Reason for test
To ensure that the option to return to a previous page works

Initial configuration
WAP session active
Test procedure
Using MMI commands go to another page. Then use the back options within the MMI to go back to the original page.

Expected behaviour
The original page is displayed.

44.1.4.4 Wrong URL – not found
Description
Ensure that the MS indicates when a URL is not found
Related 3GPP core specifications
None
Reason for test
To ensure that the MS indicates when a URL is not found
Initial configuration
WAP session active
Test procedure
Enter a URL for a site that does not exist.
Expected behaviour
The MS shall indicate that the URL is not found

44.1.4.5 URL is not a valid WML document
Note: in that case, both MS and WAP gateway are involved.
Description
Ensure that the MS indicates when a URL does not contain a valid WML document
Related 3GPP core specifications
None
Reason for test
To ensure that the MS indicates when a URL does not contain a valid WML document
Initial configuration
WAP session active
Test procedure
Enter a URL for a site does not contain a valid WML document.
Expected behaviour
The MS shall indicate that the URL does not contain a valid WML document.

44.1.4.6 Auto add an http:// to URL
Note: this behaviour is not compulsory in the WAP standards, but desirable.
Description
Ensure that the MS automatically adds an http:// prefix to an entered URL
Related 3GPP core specifications
None
Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
WAP session active

Test procedure
Enter a URL for a site without the http:// prefix.

Expected behaviour
The MS shall correctly retrieve the page as if the http:// prefix were present.

44.1.4.7 URL is host – without slash

Note: this behaviour is not compulsory in the WAP standards, but desirable.

Description
Ensure that the MS correctly retrieves a site URL in the form where the URL lacks both and http:// prefix and a closing slash character (e.g. wap.dailynews.com)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
WAP session active

Test procedure
Enter a URL for a site the where the URL lacks both and http:// prefix and a closing slash character.

Expected behaviour
The MS shall correctly retrieve the page.

44.1.4.8 URL is host – with slash

Note: this behaviour is not compulsory in the WAP standards, but desirable.

Description
Ensure that the MS correctly retrieves a site URL in the form where the URL lacks an http:// prefix but has a closing slash character (e.g. wap.dailynews.com/)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
WAP session active

Test procedure
Enter a URL for a site the where the URL lacks an http:// prefix but has a closing slash character.

Expected behaviour
The MS shall correctly retrieve the page.
44.1.4.9 URL is empty (or http:// only)

Description
Ensure that the MS indicates that it cannot retrieve a page where the URL is empty

Related 3GPP core specifications
None

Reason for test
To ensure that the MS indicates that it cannot retrieve a page where the URL is empty

Initial configuration
WAP session active

Test procedure
Attempt to retrieve a page where the URL is empty.

Expected behaviour
The MS shall indicate that it cannot retrieve the page.

44.1.4.10 Save Bookmark in Mobile Memory

Description
Ensure that the MS can save the current page as a bookmark

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can save the current page as a bookmark

Initial configuration
WAP session active

Test procedure
Go to a page not currently bookmarked. Using MMI commands, bookmark the page

Expected behaviour
The MS shall indicate that the page was successfully bookmarked. The URL shall be included on the list of bookmarked pages in the MS.

44.1.4.11 Go to Bookmark from Mobile Memory

Description
Ensure that the MS can go to a page saved as a bookmark

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can go to a page saved as a bookmark

Initial configuration
WAP session active

Test procedure
Using MMI commands select a bookmark and go to the page
Expected behaviour
The MS shall display the bookmarked page.

44.1.4.12 Go to URL (as menu option)
Description
Ensure that the MS can go to a page listed within the menus
Related 3GPP core specifications
None
Reason for test
To ensure that the MS can go to a URL
Initial configuration
WAP session active
Test procedure
Using MMI commands select a URL from one of the menus and go to the page
Expected behaviour
The MS shall display the URL page.

44.1.4.13 Inactive (connection) Timeout
Note: this test should be performed against several different WAP gateways, and should be repeated for both PS & CS WAP connections.
Description
Ensure that the MS clears the call after a WAP session has been inactive for a period
Related 3GPP core specifications
None
Reason for test
To ensure that the MS clears the call after a WAP session has been inactive for a period
Initial configuration
WAP session active, a suitable period of time has been set in the parameter configuration.
Test procedure
Make no new commands in the current WAP session for a period.
Expected behaviour
After the activity timer times out, the proper message shall be send to the gateway in order to close the session and the call shall be cleared.

44.1.4.14 Reload Site
Note: this behaviour is not compulsory in the WAP standards, but desirable.
Description
Ensure that the MS can reload the contents of a page
Related 3GPP core specifications
None
Reason for test
To ensure that the MS can reload the contents of a page
Initial configuration
WAP session active set to a page whose contents are regularly updated

Test procedure
Using MMI commands reload the current page

Expected behaviour
The updated contents of the page shall be displayed

44.1.4.15 Clear Cache
Description
Ensure that the MS can clear its page cache

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can clear its page cache

Initial configuration
WAP session active

Test procedure
Using MMI commands clear the page cache

Expected behaviour
Past pages shall no longer be retrievable from the page cache.

Note: a possibility to check whether the cache is empty is to measure the connection time.

44.1.5 WML

44.1.5.1 Site title
Description
Ensure that the MS displays the site title

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the site title

Initial configuration
WAP session active

Test procedure
Using MMI commands, select site which contains a site title

Expected behaviour
The site title shall be correctly displayed

44.1.5.2 Site title larger than Display
Description
Ensure that the MS displays the site title when larger than the display
Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the site title when larger than the display

Initial configuration
WAP session active

Test procedure
Using MMI commands, select site which contains a site title which is larger than the display

Expected behaviour
The site title shall be correctly displayed, using scrolling or other appropriate means

44.1.5.3 International characters in title

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the site title when international or accented characters are included

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the site title when international or accented characters are included

Initial configuration
WAP session active

Test procedure
Using MMI commands, select site which contains a site title containing international or accented characters

Expected behaviour
The site title shall be correctly displayed, including the international or accented characters

44.1.5.4 International characters in content

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the page content when international or accented characters are included

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when international or accented characters are included

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains international or accented characters in the page content.
Expected behaviour
The page shall be correctly displayed, including the international or accented characters

44.1.5.5 Other special characters (<> " & ‘ )

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the page content when special characters are included

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when special characters are included

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains special characters in the page content. The coding of the special characters should be 2 different codings for the special characters to be identified.

Expected behaviour
The page shall be correctly displayed, including the special characters

44.1.5.6 Bitmap <= Display

Description
Ensure that the MS displays the page content when it includes a bitmap smaller than the width and height of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap smaller than the width and height of the display

Initial configuration
WAP session active

Test procedure
Using MMI commands select a site which contains includes a bitmap smaller than the width and height of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap

44.1.5.7 Bitmap > Display-width (zoom / scroll)

Description
Ensure that the MS displays the page content when it includes a bitmap wider than the width of the display

Related 3GPP core specifications
None
Reason for test
To ensure that the MS displays the page content when it includes a bitmap wider than the width of the display

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a bitmap wider than the width of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap. The bitmap shall be made visible by means of scrolling and or zoom commands

44.1.5.8 Bitmap > Display-height (zoom / scroll)

Description
Ensure that the MS displays the page content when it includes a bitmap taller than the height of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap taller than the height of the display

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a bitmap taller than the height of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap. The bitmap shall be made visible by means of scrolling and or zoom commands

44.1.5.9 Bitmap alignment

Description
Ensure that the MS displays the page content when it includes a bitmap which is right-aligned or centred

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap that is right-aligned or centred

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a bitmap which is right-aligned. Then select a site containing a centred bitmap

Expected behaviour
The pages shall be correctly displayed, including the bitmaps.
44.1.5.10 Soft hyphen

Description
Ensure that the MS correctly displays the page content when it includes a soft hyphen

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a soft hyphen

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains soft hyphen at a point where the word will be split into two lines. Then select a site which contains a soft hyphen at a point where the word will not be split into two lines

Expected behaviour
The pages shall be correctly displayed, showing the hyphen at the end of the line for the first page, and not showing the hyphen for the second page.

44.1.5.11 Non-breaking space

Description
Ensure that the MS correctly displays the page content when it includes a non-breaking space

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a non-breaking space

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a non-breaking space at a point where the line would wrap if there was an ordinary space

Expected behaviour
The pages shall be correctly displayed, with the line break occurring immediately before the words separated by the non-breaking space.

44.1.5.12 Line feed

Description
Ensure that the MS correctly displays the page content when it includes a line feed

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a line feed

Initial configuration
WAP session active
Test procedure
Using MMI commands, select a site which contains a short line terminated by a line feed

Expected behaviour
The pages shall be correctly displayed, with the line break occurring according to the position of the line feed.

44.1.5.13 Input field as password (hidden characters)
Description
Ensure that the MS correctly displays the page content when it includes password input field

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes password input field

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a password input field. Enter a password into the field

Expected behaviour
The page shall be correctly displayed. The password characters entered by the user shall not be displayed, but shall be replaced with masking characters.

44.1.5.14 Input field without maxlen
Description
Ensure that the MS allows at least 90 characters to be entered into an input field with no specified maximum length

Related 3GPP core specifications
None

Reason for test
To ensure that the MS allows at least 90 characters to be entered into an input field with no specified maximum length

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains an input field with no specified maximum length. Enter at least 90 characters into the field

Expected behaviour
The field shall accept the characters.

44.1.5.15 Input field with maxlen = 5
Description
Ensure that the MS limits the number of characters that can be entered into a field with maximum length of 5
Related 3GPP core specifications
None

Reason for test
To ensure that the MS limits the number of characters that can be entered into a field with maximum length of 5

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains an input field with a specified maximum length of 5 characters. Enter at as many characters as possible into the field

Expected behaviour
The MS shall reject attempts to enter more than 5 characters.

44.1.5.16 Input field with maxlen =30

Description
Ensure that the MS limits the number of characters that can be entered into a field with maximum length of 30

Related 3GPP core specifications
None

Reason for test
To ensure that the MS limits the number of characters that can be entered into a field with maximum length of 30

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains an input field with a specified maximum length of 30 characters. Enter at as many characters as possible into the field

Expected behaviour
The MS shall reject attempts to enter more than 30 characters.

44.1.5.17 Input field with default value

Description
Ensure that the MS correctly manages an input field which contains a default value

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly manages an input field which contains a default value

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains an input field which contains a default value. Send the default contents of the field.

Then, for a separate field with a default value, change the contents of the field before sending its contents
Expected behaviour
The MS shall send the correct values for both fields.

44.1.5.18 Input field with default value - >90 characters
Description
Ensure that the MS correctly manages an input field which contains a default value of more than 90 characters
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly manages an input field that contains a default value of more than 90 characters
Initial configuration
WAP session active
Test procedure
Using MMI commands, select a site which contains an input field which contains a default value of more than 90 characters. Send the default contents of the field.
Then, for a separate field with a default value, change the contents of the field before sending its contents
Expected behaviour
The MS shall send the correct values for both fields.

44.1.5.19 Formatted input field – e.g. Date NN\,NN
Description
Ensure that the MS correctly manages a formatted input field
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly manages a formatted input field
Initial configuration
WAP session active
Test procedure
Using MMI commands, select a site which contains a formatted input field. Attempt to enter data not conforming to the formatting rules
Expected behaviour
The MS shall reject attempts to enter data not conforming to the formatting rules.

44.1.5.20 Table (smaller than Display)
Description
Ensure that the MS correctly displays a table smaller than the width of the display
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly displays a table smaller than the width of the display
Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a table smaller than the width of the display

Expected behaviour
The table shall be correctly displayed

44.1.5.21 Table (wider than Display)
Description
Ensure that the MS correctly displays a table wider than the width of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays a table wider than the width of the display

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a table wider than the width of the display

Expected behaviour
The table shall be correctly displayed, and the whole of the table shall be visible by means of horizontal scrolling commands.

44.1.5.22 Text align=left
Description
Ensure that the MS correctly displays text which is left-aligned

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text which is left-aligned

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text which is left-aligned

Expected behaviour
The text shall be correctly displayed.

44.1.5.23 Text align=center
Description
Ensure that the MS correctly displays text which is centred

Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly displays text that is centred

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text which is centred

Expected behaviour
The text shall be correctly displayed.

44.1.5.24 Text align=right

Description
Ensure that the MS correctly displays text which is right-aligned

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text that is right-aligned

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text which is right-aligned

Expected behaviour
The text shall be correctly displayed.

44.1.5.25 No wrap (of a very long line)

Description
Ensure that the MS correctly displays a long line which cannot be wrapped (either because it is one long word or because it uses non-breaking spaces)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays a long line that cannot be wrapped (either because it is one long word or because it uses non-breaking spaces)

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains a long line which cannot be wrapped

Expected behaviour
The text shall be correctly displayed, and the whole line shall be visible by means of horizontal scrolling commands

44.1.5.26 Emphasis

Description
Ensure that the MS correctly displays text with the Emphasis tag
Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the Emphasis tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the Emphasis tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.27 Strong
Description
Ensure that the MS correctly displays text with the Strong tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the Strong tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the Strong tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.28 Big
Description
Ensure that the MS correctly displays text with the ‘Big’ tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the ‘Big’ tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the ‘Big’ tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.29 Bold
Description
Ensure that the MS correctly displays text with the ‘Bold’ tag
Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the ‘Bold’ tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the ‘Bold’ tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.30 Italic

Description
Ensure that the MS correctly displays text with the ‘Italic’ tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the ‘Italic’ tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the ‘Italic’ tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.31 Small

Description
Ensure that the MS correctly displays text with the ‘Small’ tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the ‘Small’ tag

Initial configuration
WAP session active

Test procedure
Using MMI commands, select a site which contains text with the ‘Small’ tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.1.5.32 Underline

Description
Ensure that the MS correctly displays text with the Underline tag
Related 3GPP core specifications  
None

Reason for test  
To ensure that the MS correctly displays text with the Underline tag

Initial configuration  
WAP session active.

Test procedure  
Using MMI commands, select a site which contains text with the Underline tag

Expected behaviour  
The text shall be correctly displayed with suitable formatting

44.1.6  WTAI  
Description  
Ensure that the MS correctly calls a number contained in a WTAI field when the field is selected

Related 3GPP core specifications  
None

Reason for test  
To ensure that the MS correctly calls a number contained in a WTAI field when the field is selected

Initial configuration  
WAP session active

Test procedure  
1. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in national syntax (0172...)>. Select the field, and check that a voice call is made.  
2. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in international syntax (+ not masked)>. Select the field, and check that a voice call is made.  
3. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in international syntax (+ as %2B)>. Select the field, and check that a voice call is made.

Expected behaviour  
In each case, MS shall ask the user before making the call, shall call the correct number, and shall return to the browser (same page) on completion of the call.

44.1.7  WCDMA/GSM Interworking  
44.1.7.1  Incoming SM while WAP session  
Description  
Ensure that an MT-SM can be received while the MS is engaged in a WAP session.

Related 3GPP core specifications  
GSM 03.40, GSM 04.11

Reason for test  
To ensure that an MT-SM can be received while the MS is engaged in a WAP session
Initial configuration
WAP session active

Test procedure
While the WAP session is active, arrange for an MT-SM to be sent to the MS. Check that an indication is made when the SM is received, then view the message without terminating the WAP session.

Expected behaviour
The SM shall have been correctly received without terminating the WAP session.

44.1.7.2 Incoming Call while WAP offline browsing

Description
Ensure that an incoming call is indicated while the MS is engaged in WAP offline browsing.

Related 3GPP core specifications
GSM 04.08

Reason for test
To ensure that an incoming call is indicated while the MS is engaged in WAP offline browsing.

Initial configuration
MS in Idle mode, WAP offline browsing in progress

Test procedure
While the WAP offline browsing in progress, arrange for a call to be made to the MS. When the call is indicated, answer the call.

Expected behaviour
The incoming call shall be indicated. It shall be possible to answer the call and for two-way speech to take place.

44.1.7.3 Incoming SM while WAP offline browsing

Description
Ensure that an MT-SM can be received while WAP offline browsing in progress.

Related 3GPP core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an MT-SM can be received while WAP offline browsing in progress

Initial configuration
MS in Idle mode, WAP offline browsing in progress

Test procedure
While the WAP offline browsing in progress, arrange for an MO-SM to be sent to the MS. Check that an indication is made when the SM is received, then view the message

Expected behaviour
The SM shall have been correctly received.

44.1.7.4 Incoming Call while WAP online browsing

Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an incoming call is indicated while the MS is engaged in WAP offline browsing.
Related 3GPP core specifications
GSM 04.08

Reason for test
To ensure that an incoming call is indicated while the MS is engaged in WAP online browsing.

Initial configuration
MS in Idle mode, WAP online browsing in progress

Test procedure
While the WAP online browsing in progress, arrange for a call to be made to the MS. When the call is indicated, answer the call.

Expected behaviour
The incoming call shall be indicated. It shall be possible to answer the call and for two-way speech to take place.

44.1.7.5 Incoming SM while WAP online browsing

Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MT-SM can be received while WAP offline browsing in progress.

Related 3GPP core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an MT-SM can be received while WAP online browsing in progress

Initial configuration
MS in Idle mode, WAP online browsing in progress

Test procedure
While the WAP online browsing in progress, arrange for an MO-SM to be sent to the MS. Check that an indication is made when the SM is received, then view the message

Expected behaviour
The SM shall have been correctly received.

44.1.7.6 MO Call after WAP Session

Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MO call can be made following completion of a WAP session.

Related 3GPP core specifications
GSM 04.08

Reason for test
To ensure that an MO call can be made following completion of a WAP session

Initial configuration
WAP session active

Test procedure
Clear the WAP session, and then attempt to make an outgoing call speech.
Expected behaviour
The outgoing call shall be correctly completed. The call shall go to the correct number and two-way speech shall be possible.

44.1.7.7 MO SM after WAP Session
Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MO SM can be sent following completion of a WAP session.

Related 3GPP core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an MO SM can be sent following completion of a WAP session

Initial configuration
WAP session active

Test procedure
Clear the WAP session, and then attempt to create and send an MO SM.

Expected behaviour
The MO SM shall be sent, and correctly received at its destination.

44.1.7.8 MT Call after WAP Session
Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MT call can be received following completion of a WAP session.

Related 3GPP core specifications
GSM 04.08

Reason for test
To ensure that an MT call can be received following completion of a WAP session

Initial configuration
WAP session active

Test procedure
Clear the WAP session, and then arrange for a speech call to be made to the MS.

Expected behaviour
The incoming call shall be indicated. It shall be possible to answer the call and for two-way speech to take place.

44.1.7.9 MT SM after WAP Session
Note: This test should be repeated for both CS and PS WAP connections.

Description
Ensure that an MT-SM can be received following completion of a WAP session.

Related 3GPP core specifications
GSM 03.40, GSM 04.11
Reason for test
To ensure that an MO-SM can be received following completion of a WAP session

Initial configuration
WAP session active

Test procedure
Clear the WAP session, and then arrange for an SM to be sent to the MS.

Expected behaviour
The SM shall be correctly received and viewed.

44.1.7.10 Incoming SIM application Toolkit while WAP session

Note: This test should be repeated for both CS and PS WAP connections.

Description
Ensure that a SIM toolkit application can trigger MMI access (e.g. Set up menu) and can be taken into account while the MS is engaged in a WAP session.

Related 3GPP core specifications
[To be filled]

Reason for test
To ensure that a SIM toolkit application can trigger MMI access (e.g. Set up menu) and can be taken into account while the MS is engaged in a WAP session.

Initial configuration
WAP session active, SIM with a proactive SIM toolkit application

Test procedure
While the WAP session is active, arrange for a proactive command is sent from the SIM to the ME. Check that an indication is made when the command is received, then enter in the SIM toolkit session without terminating the WAP session.

Expected behaviour
The SIM toolkit session should occur properly without terminating the WAP session.

44.1.7.11 Incoming SMS-CB while WAP session

NOTE: Tests covering this subject will be added at a later date.

44.1.7.12 Incoming USSD request while WAP session

NOTE: Tests covering this subject will be added at a later date.

44.2 Additional tests for terminals supporting WAP 2.0 / Browsing 2.1

44.2.1 UAPROF document is accessed correctly

Description
Ensure that the MS accesses its UAProfile document correctly.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS accesses the correct UAPROF document on the internet, and renders according to the specification in the UAPROF document
Initial configuration
WAP session is active. A test site is available to deliver known content for handset, which will be rendered according to the specification in the UAPROF document.

Test procedure
Enter a URL for the site that contains the test content.

Expected behaviour
The MS shall access and render the content on the test page according to the UAPROF document.

44.2.2 Certificate Handling
Description
Ensure that the MS can process certificates of size up to 700 bytes (up to 1000 bytes if ME supports X.509 based server authentication)

Related specifications
WAP-211-WAPCert (WAP Certificate and CRL Profiles)

Reason for test
To ensure that the MS can handle large certificate sizes

Initial configuration
WAP session is active. A test site is available to download a certificate of 700 bytes and 1000 bytes.

Test procedure
Attempt to download a certificate of 700 bytes (1000 bytes if X.509)

Expected behaviour
The MS shall download and process the certificate without error.

44.2.3 Pictogram Handling
Description
Ensure that the MS contains the core pictograms and can render them without reference to the network.

Related specifications
WAP-213-WAPInterPic-20010406-a (WAP Pictogram specification)

Reason for test
To ensure that the MS contains (as a minimum) the core pictograms

Initial configuration
WAP session is active. A test site is available to download a WAP page that references all the core pictograms, but does not supply them for download.

Test procedure
Access the test WAP page that contains reference to the core pictograms.

Expected behaviour
The MS shall download the page and render the core pictograms that are stored on the MS.

44.2.4 Service Indication
Description
Ensure that the MS can receive a service indication message
Related specifications

None

Reason for test

To ensure that the MS can receive a service indication message

Initial configuration

WAP session is active. A WAP PUSH server is configured to send messages to the MS.

Test procedure

Send a WAP Push Service Indication to the MS with a presentation text and destination URL. Wait for receipt of WAP PUSH service indication. Launch the service

Expected behaviour

The user must be warned a WAP Push SI message has been received. When opening the message, the text must be presented to the end user. The user must have the possibility to launch the service directly or to launch it later. When the user chooses to launch the service, it must launch the WAP Browser to the included URL. The Service Indication Message must be saved in the Push Message Inbox

44.2.5 HTML

44.2.5.1 Wrong URL – not found

Description

Ensure that the MS indicates when a URL is not found

Related 3GPP core specifications

None

Reason for test

To ensure that the MS indicates when a URL is not found

Initial configuration

WAP 2.0 session active

Test procedure

Enter a URL for a site that does not exist.

Expected behaviour

The MS shall indicate that the URL is not found

44.2.5.2 URL is not a valid HTML/WML document

Note: in that case, both MS and WAP gateway are involved.

Description

Ensure that the MS indicates when a URL does not contain a valid HTML/WML document

Related 3GPP core specifications

None

Reason for test

To ensure that the MS indicates when a URL does not contain a valid HTML/WML document
Initial configuration
Browsing session active

Test procedure
Enter a URL for a site does not contain a valid HTML/WML document.

Expected behaviour
The MS shall indicate that the URL does not contain a valid HTML/WML document.

44.2.5.3 Auto add an http:// to URL

Note: this behaviour is not compulsory in the WAP standards, but desirable.

Description
Ensure that the MS automatically adds an http:// prefix to an entered URL

Related 3GPP core specifications
None

Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
Browsing session active

Test procedure
Enter a URL for a site without the http:// prefix.

Expected behaviour
The MS shall correctly retrieve the page as if the http:// prefix were present.

44.2.5.4 URL is host – without slash

Note: this behaviour is not compulsory in the WAP standards, but desirable.

Description
Ensure that the MS correctly retrieves a site URL in the form where the URL lacks both and http:// prefix and a closing slash character (e.g. www.dailynews.com)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
Browsing session active

Test procedure
Enter a URL for a site the where the URL lacks both and http:// prefix and a closing slash character.

Expected behaviour
The MS shall correctly retrieve the page.

44.2.5.5 URL is host – with slash

Note: this behaviour is not compulsory in the WAP standards, but desirable.
Description
Ensure that the MS correctly retrieves a site URL in the form where the URL lacks an http:// prefix but has a closing slash character (e.g. wap.dailynews.com/)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS automatically adds an http:// prefix to an entered URL

Initial configuration
Browsing session active

Test procedure
Enter a URL for a site the where the URL lacks an http:// prefix but has a closing slash character.

Expected behaviour
The MS shall correctly retrieve the page.

44.2.5.6 URL is empty (or http:// only)

Description
Ensure that the MS indicates that it cannot retrieve a page where the URL is empty

Related 3GPP core specifications
None

Reason for test
To ensure that the MS indicates that it cannot retrieve a page where the URL is empty

Initial configuration
Browsing session active

Test procedure
Attempt to retrieve a page where the URL is empty.

Expected behaviour
The MS shall indicate that it cannot retrieve the page.

44.2.5.7 Go to URL (as menu option)

Description
Ensure that the MS can go to a page listed within the menus

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can go to a URL

Initial configuration
Browsing session active

Test procedure
Using MMI commands select a URL from one of the menus and go to the page

Expected behaviour
The MS shall display the URL page.
44.2.5.8 Inactive (connection) Timeout

Note: this test should be performed against several different WAP gateways, and should be repeated for both PS & CS WAP 2.0 connections.

**Description**
Ensure that the MS clears the call after a browsing session has been inactive for a period.

**Related 3GPP core specifications**
None

**Reason for test**
To ensure that the MS clears the call after a browsing session has been inactive for a period.

**Initial configuration**
Browsing session active, a suitable period of time has been set in the parameter configuration.

**Test procedure**
Make no new commands in the current browsing session for a period.

**Expected behaviour**
After the activity timer times out, the proper message shall be send to the gateway in order to close the session and the call shall be cleared.

44.2.5.9 Reload Site

Note: this behaviour is not compulsory in the WAP standards, but desirable.

**Description**
Ensure that the MS can reload the contents of a page.

**Related 3GPP core specifications**
None

**Reason for test**
To ensure that the MS can reload the contents of a page

**Initial configuration**
Browsing session active set to a page whose contents are regularly updated.

**Test procedure**
Using MMI commands reload the current page.

**Expected behaviour**
The updated contents of the page shall be displayed.

44.2.5.10 Site title

**Description**
Ensure that the MS displays the site title.

**Related 3GPP core specifications**
None

**Reason for test**
To ensure that the MS displays the site title.

**Initial configuration**
Browsing session active.
Test procedure
Using MMI commands, select site which contains a site title

Expected behaviour
The site title shall be correctly displayed

44.2.5.11 Site title larger than Display

Description
Ensure that the MS displays the site title when larger than the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the site title when larger than the display

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select site which contains a site title which is larger than the display

Expected behaviour
The site title shall be correctly displayed, using scrolling or other appropriate means

44.2.5.12 International characters in title

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the site title when international or accented characters are included

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the site title when international or accented characters are included

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select site which contains a site title containing international or accented characters

Expected behaviour
The site title shall be correctly displayed, including the international or accented characters

44.2.5.13 International characters in content

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the page content when international or accented characters are included

Related 3GPP core specifications
None
Reason for test
To ensure that the MS displays the page content when international or accented characters are included

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains international or accented characters in the page content.

Expected behaviour
The page shall be correctly displayed, including the international or accented characters

44.2.5.14 Other special characters (< > “ & ‘ )

Note: this test should be performed against several different WAP gateways.

Description
Ensure that the MS displays the page content when special characters are included

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when special characters are included

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains special characters in the page content. The coding of the special characters should be 2 different codings for the special characters to be identified.

Expected behaviour
The page shall be correctly displayed, including the special characters

44.2.5.15 Bitmap <= Display

Description
Ensure that the MS displays the page content when it includes a bitmap smaller than the width and height of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap smaller than the width and height of the display

Initial configuration
Browsing session active

Test procedure
Using MMI commands select a site which contains includes a bitmap smaller than the width and height of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap
44.2.5.16 Bitmap > Display-width (zoom / scroll)

Description
Ensure that the MS displays the page content when it includes a bitmap wider than the width of the display.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap wider than the width of the display.

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a bitmap wider than the width of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap. The bitmap shall be made visible by means of scrolling and or zoom commands.

44.2.5.17 Bitmap > Display-height (zoom / scroll)

Description
Ensure that the MS displays the page content when it includes a bitmap taller than the height of the display.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap taller than the height of the display.

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a bitmap taller than the height of the display.

Expected behaviour
The page shall be correctly displayed, including the bitmap. The bitmap shall be made visible by means of scrolling and or zoom commands.

44.2.5.18 Bitmap alignment

Description
Ensure that the MS displays the page content when it includes a bitmap which is right-aligned or centred.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS displays the page content when it includes a bitmap that is right-aligned or centred.
Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a bitmap which is right-aligned. Then select a site containing a centred bitmap

Expected behaviour
The pages shall be correctly displayed, including the bitmaps.

44.2.5.19 Soft hyphen

Description
Ensure that the MS correctly displays the page content when it includes a soft hyphen

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a soft hyphen

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains soft hyphen at a point where the word will be split into two lines. Then select a site which contains a soft hyphen at a point where the word will not be split into two lines

Expected behaviour
The pages shall be correctly displayed, showing the hyphen at the end of the line for the first page, and not showing the hyphen for the second page.

44.2.5.20 Non-breaking space

Description
Ensure that the MS correctly displays the page content when it includes a non-breaking space

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a non-breaking space

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a non-breaking space at a point where the line would wrap if there was an ordinary space

Expected behaviour
The pages shall be correctly displayed, with the line break occurring immediately before the words separated by the non-breaking space.

44.2.5.21 Line feed

Description
Ensure that the MS correctly displays the page content when it includes a line feed
Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes a line feed

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a short line terminated by a line feed

Expected behaviour
The pages shall be correctly displayed, with the line break occurring according to the position of the line feed.

44.2.5.22 Input field as password (hidden characters)
Description
Ensure that the MS correctly displays the page content when it includes password input field

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays the page content when it includes password input field

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a password input field. Enter a password into the field

Expected behaviour
The page shall be correctly displayed. The password characters entered by the user shall not be displayed, but shall be replaced with masking characters.

44.2.5.23 Input field without maxlength
Description
Ensure that the MS allows at least 90 characters to be entered into an input field with no specified maximum length

Related 3GPP core specifications
None

Reason for test
To ensure that the MS allows at least 90 characters to be entered into an input field with no specified maximum length

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains an input field with no specified maximum length. Enter at least 90 characters into the field
Expected behaviour
The field shall accept the characters.

44.2.5.24 Input field with maxlen = 5
Description
Ensure that the MS limits the number of characters that can be entered into a field with maximum length of 5
Related 3GPP core specifications
None
Reason for test
To ensure that the MS limits the number of characters that can be entered into a field with maximum length of 5
Initial configuration
Browsing session active
Test procedure
Using MMI commands, select a site which contains an input field with a specified maximum length of 5 characters. Enter as many characters as possible into the field
Expected behaviour
The MS shall reject attempts to enter more than 5 characters.

44.2.5.25 Input field with maxlen = 30
Description
Ensure that the MS limits the number of characters that can be entered into a field with maximum length of 30
Related 3GPP core specifications
None
Reason for test
To ensure that the MS limits the number of characters that can be entered into a field with maximum length of 30
Initial configuration
Browsing session active
Test procedure
Using MMI commands, select a site which contains an input field with a specified maximum length of 30 characters. Enter as many characters as possible into the field
Expected behaviour
The MS shall reject attempts to enter more than 30 characters.

44.2.5.26 Input field with default value
Description
Ensure that the MS correctly manages an input field which contains a default value
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly manages an input field which contains a default value
Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains an input field which contains a default value. Send the default contents of the field.
Then, for a separate field with a default value, change the contents of the field before sending its contents.

Expected behaviour
The MS shall send the correct values for both fields.

44.2.5.27 Input field with default value - >90 characters

Description
Ensure that the MS correctly manages an input field which contains a default value of more than 90 characters.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly manages an input field that contains a default value of more than 90 characters

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains an input field which contains a default value of more than 90 characters. Send the default contents of the field.
Then, for a separate field with a default value, change the contents of the field before sending its contents.

Expected behaviour
The MS shall send the correct values for both fields.

44.2.5.28 Formatted input field – e.g. Date NN\NN

Description
Ensure that the MS correctly manages a formatted input field.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly manages a formatted input field.

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a formatted input field. Attempt to enter data not conforming to the formatting rules.

Expected behaviour
The MS shall reject attempts to enter data not conforming to the formatting rules.
44.2.5.29 Table (smaller than Display)

Description
Ensure that the MS correctly displays a table smaller than the width of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays a table smaller than the width of the display

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a table smaller than the width of the display

Expected behaviour
The table shall be correctly displayed

44.2.5.30 Table (wider than Display)

Description
Ensure that the MS correctly displays a table wider than the width of the display

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays a table wider than the width of the display

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains a table wider than the width of the display

Expected behaviour
The table shall be correctly displayed, and the whole of the table shall be visible by means of horizontal scrolling commands.

44.2.5.31 Text align=left

Description
Ensure that the MS correctly displays text which is left-aligned

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text which is left-aligned

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text which is left-aligned
Expected behaviour
The text shall be correctly displayed.

44.2.5.32 Text align=center
Description
Ensure that the MS correctly displays text which is centred
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly displays text that is centred
Initial configuration
Browsing session active
Test procedure
Using MMI commands, select a site which contains text which is centred
Expected behaviour
The text shall be correctly displayed.

44.2.5.33 Text align=right
Description
Ensure that the MS correctly displays text which is right-aligned
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly displays text that is right-aligned
Initial configuration
Browsing session active
Test procedure
Using MMI commands, select a site which contains text which is right-aligned
Expected behaviour
The text shall be correctly displayed.

44.2.5.34 No wrap (of a very long line)
Description
Ensure that the MS correctly displays a long line which cannot be wrapped (either because it is one long word or because it uses non-breaking spaces)
Related 3GPP core specifications
None
Reason for test
To ensure that the MS correctly displays a long line that cannot be wrapped (either because it is one long word or because it uses non-breaking spaces)
Initial configuration
Browsing session active
Test procedure
Using MMI commands, select a site which contains a long line which cannot be wrapped

Expected behaviour
The text shall be correctly displayed, and the whole line shall be visible by means of horizontal scrolling commands

44.2.5.35 Emphasis

Description
Ensure that the MS correctly displays text with the Emphasis tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the Emphasis tag

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the Emphasis tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.36 Strong

Description
Ensure that the MS correctly displays text with the Strong tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the Strong tag

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the Strong tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.37 Big

Description
Ensure that the MS correctly displays text with the ‘Big’ tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the ‘Big’ tag
Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the 'Big' tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.38 Bold

Description
Ensure that the MS correctly displays text with the 'Bold' tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the 'Bold' tag

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the 'Bold' tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.39 Italic

Description
Ensure that the MS correctly displays text with the 'Italic' tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the 'Italic' tag

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the 'Italic' tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.40 Small

Description
Ensure that the MS correctly displays text with the 'Small' tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the 'Small' tag
Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the “Small” tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.41 Underline

Description
Ensure that the MS correctly displays text with the Underline tag

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly displays text with the Underline tag

Initial configuration
Browsing session active

Test procedure
Using MMI commands, select a site which contains text with the Underline tag

Expected behaviour
The text shall be correctly displayed with suitable formatting

44.2.5.42 WTAI

Description
Ensure that the MS correctly calls a number contained in a WTAI field when the field is selected

Related 3GPP core specifications
None

Reason for test
To ensure that the MS correctly calls a number contained in a WTAI field when the field is selected

Initial configuration
Browser session active

Test procedure
1. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in national syntax (0172...)>. Select the field, and check that a voice call is made.

2. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in international syntax (+ not masked)>. Select the field, and check that a voice call is made.

3. Using MMI commands, select a site which contains a WTAI field in the form wtai://wp/mc;<phone number in international syntax (+ as %2B)>. Select the field, and check that a voice call is made.

Expected behaviour
In each case, MS shall ask the user before making the call, shall call the correct number, and shall return to the browser (same page) on completion of the call.
44.2.5.43 Go to secure URL

Description
Ensure that the MS can go to a secure page

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can go to a secure URL

Initial configuration
Browsing session active

Test procedure
Using MMI commands select a URL from one of the menus and go to the page

Expected behaviour
The MS shall display the URL page.

44.2.5.44 Go to embedded link

Description
Ensure that the MS can go to a page from an embedded link.

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can go to a page from an embedded link

Initial configuration
Browsing session active

Test procedure
Scroll to an embedded link in an HTML page and select it.

Expected behaviour
The MS shall display the URL page, without any intermediate browser screens being displayed.

44.2.5.45 Save page items

Description
Ensure that the MS can save items in a page (e.g. pictures, icons etc.)

Related 3GPP core specifications
None

Reason for test
To ensure that the MS can save items in a page (e.g. pictures, icons etc.)

Initial configuration
Browsing session active

Test procedure
Scroll to an item in an active URL page.
Select the online menu of the browser
Select the ‘save as’ or equivalent option.
End the browser session and check that the item has been correctly saved in the MS

**Expected behaviour**
The MS shall be able to save an item from a URL page during an active browsing session.

### 44.2.5.46 Empty Cache during browsing

**Description**
Ensure that the MS can clear the cache during an active session

**Related 3GPP/GSM core specifications**
None

**Reason for test**
To ensure that the MS can clear the cache during an active session

**Initial configuration**
Browsing session active

**Test procedure**
Access the online menu of the browser.
Select ‘Clear Cache’ or equivalent item

**Expected behaviour**
The MS correctly clears all cached pages

### 44.2.5.47 Cancel page loading during session

**Description**
Ensure that the MS can cancel a page load

**Related 3GPP/GSM core specifications**
None

**Reason for test**
To ensure that the MS can cancel a page load during an active session

**Initial configuration**
Browsing session active

**Test procedure**
Initiate load of a URL page.
Try to cancel the loading of the page using the ‘cancel’ key or equivalent menu option

**Expected behaviour**
A ‘cancel’ option must be available.
It must be possible to cancel the page load before the page is fully loaded.
The browser should remain connected.

### 44.2.5.48 Redirection to alternate URL

**Description**
Ensure the browser can handle redirection when the requested resource has been assigned a new permanent URL

**Related 3GPP/GSM core specifications**
None
Reason for test
To ensure the browser can handle redirection when the requested resource has been assigned a new permanent URL

Initial configuration
Browsing session active

Test procedure
Initiate load of a URL page which has been permanently redirected
Accept the redirect
Initiate load of a URL page which has been permanently redirected
Reject the redirect

Expected behaviour
The correct message must be displayed to the end user (E.g. “301 MOVED PERMANENTLY”)
The user must be asked if he wants to be redirected.
If he accepts, he must be redirected to a page displaying the text "Redirection successful". When reloaded this page the result should the same.
If he does not accept, he must be taken back to the previous testing tool menu.

44.2.5.49 Check of supported image types

Description
Ensure that the MS can load and display all its supported image types

Related 3GPP/GSM core specifications
None

Reason for test
To ensure that the MS can load and display all its supported image types

Initial configuration
Browsing session active

Test procedure
Download images of every type that the MS supports.
(e.g. gif, jpg, png, tiff, bmp, transparent gif, animated gif, transparent png)

Expected behaviour
All supported images must download and display correctly

44.2.5.50 Check of supported video types

Description
Ensure that the MS can load and display all its supported video types

Related 3GPP/GSM core specifications
None

Reason for test
To ensure that the MS can load and display all its supported video types

Initial configuration
Browsing session active
Test procedure
Download images of every type that the MS supports.
(e.g. mp4, 3gp)

Expected behaviour
All supported video files must download and play correctly

44.2.5.51 Check of supported audio types

Description
Ensure that the MS can load and display all its supported audio types.

Related 3GPP/GSM core specifications
None

Reason for test
To ensure that the MS can load and display all its supported audio types.

Initial configuration
Browsing session active

Test procedure
Download audios of every type that the MS supports.
(e.g. mp3, wav, amr, midi, smaf etc.)

Expected behaviour
All supported audio files must download and play correctly

44.2.5.52 Page navigation during page download

Description
Ensure that the MS can navigate and execute links while the page is still downloading

Related 3GPP/GSM core specifications
None

Reason for test
To ensure that the MS can navigate and execute links while the page is still downloading

Initial configuration
Browsing session active

Test procedure
Load a URL page.
During the rendering of the page navigate to a link and select it.

Expected behaviour
The MS shall start loading the newly selected link.

44.2.6 Interworking between services

44.2.6.1 Incoming SM while browsing

Description
Ensure that an MT-SM can be received while the MS is engaged in a browsing session.
Related 3GPP/GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an MT-SM can be received while the MS is engaged in a browsing session

Initial configuration
Browsing session active

Test procedure
While the browsing session is active, arrange for an MT-SM to be sent to the MS. Check that an indication is made when the SM is received, then view the message without terminating the browsing session.

Expected behaviour
The SM shall have been correctly received without terminating the browsing session.

44.2.6.2 Incoming Call while online browsing

Note: This test should be carried out using a PS connection.

Description
Ensure that an incoming call is indicated while the MS is engaged in online browsing.

Related 3GPP/GSM core specifications
GSM 04.08

Reason for test
To ensure that an incoming call is indicated while the MS is engaged in online browsing.

Initial configuration
MS in Idle mode, WAP online browsing in progress

Test procedure
While the WAP online browsing in progress, arrange for a call to be made to the MS. When the call is indicated, answer the call.

Expected behaviour
The incoming call shall be indicated. It shall be possible to answer the call and for two-way speech to take place.

44.2.6.3 MO Call after Browsing Session

Note: This test should be carried out using a PS connection.

Description
Ensure that an MO call can be made following completion of a browsing session.

Related 3GPP/GSM core specifications
GSM 04.08

Reason for test
To ensure that an MO call can be made following completion of a browsing session

Initial configuration
Browsing session active

Test procedure
Clear the browsing session, and then attempt to make an outgoing call speech.
Expected behaviour
The outgoing call shall be correctly completed. The call shall go to the correct number and two-way speech shall be possible.

44.2.6.4 MO SM after Browsing Session

   Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MO SM can be sent following completion of a browsing session.

Related 3GPP/GSM core specifications
GSM 03.40, GSM 04.11

Reason for test
To ensure that an MO SM can be sent following completion of a browsing session

Initial configuration
Browsing session active

Test procedure
Clear the WAP session, and then attempt to create and send an MO SM.

Expected behaviour
The MO SM shall be sent, and correctly received at its destination.

44.2.6.5 MT Call after Browsing Session

   Note: This test should be carried out using a PS WAP connection.

Description
Ensure that an MT call can be received following completion of a browsing session.

Related 3GPP/GSM core specifications
GSM 04.08

Reason for test
To ensure that an MT call can be received following completion of a browsing session

Initial configuration
Browsing session active

Test procedure
Clear the browsing session, and then arrange for a speech call to be made to the MS.

Expected behaviour
The incoming call shall be indicated. It shall be possible to answer the call and for two-way speech to take place.

44.2.6.6 MT SM after Browsing Session

   Note: This test should be repeated for both CS and PS browsing connections.

Description
Ensure that an MT-SM can be received following completion of a browsing session.

Related 3GPP/GSM core specifications
GSM 03.40, GSM 04.11
Reason for test
To ensure that an MO-SM can be received following completion of a browsing session

Initial configuration
Browsing session active

Test procedure
Clear the browsing session, and then arrange for an SM to be sent to the MS.

Expected behaviour
The SM shall be correctly received and viewed.

44.2.6.7 Incoming SIM application Toolkit while browsing session

Note: This test should be repeated for both CS and PS connections.

Description
Ensure that a SIM toolkit application can trigger MMI access (e.g. Set up menu) and can be taken into account while the MS is engaged in a browsing session.

Related 3GPP core specifications
none

Reason for test
To ensure that a SIM toolkit application can trigger MMI access (e.g. Set up menu) and can be taken into account while the MS is engaged in a browsing session.

Initial configuration
Browsing session active, SIM with a proactive SIM toolkit application

Test procedure
While the browsing session is active, arrange for a proactive command is sent from the SIM to the ME. Check that an indication is made when the command is received, then enter in the SIM toolkit session without terminating the browsing session.

Expected behaviour
The SIM toolkit session should occur properly without terminating the browsing session.

44.3 Web Browsing

NOTE: Complete tests covering this subject will be added at a later date.

45 Circuit Switched Multimedia Telephony (Video Telephony)

NOTE: Instead of the term “Circuit Switched Multimedia Telephony” as used in 3GPP Specifications in the shorter term “Video Call” will be used in this chapter.

45.1 Mobile Originated Video Calls

45.1.1 Mobile Originated Video Call complete

Description
The DUT shall be able to make an MO video call.

Related 3GPP core specifications
3GPP TS 26.112
Reason for test
To ensure the DUT can successfully make an MO video call.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.

Test procedure

Normal Call
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
3. At DUT, end video call to Client 1.

Call Forwarding notification check
1. At Client 1, activate Call Forwarding to Client 2.
2. At DUT, make MO video call to Client 1.
3. Check for SS notification on DUT.
4. Answer call on Client 2.
5. At DUT, end video call to Client 2.

Expected behaviour

Normal Call
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established.
3. Video call is ended between DUT and Client 1.

Call Forwarding notification check
1. Call Forwarding is successfully setup from Client 1 to Client 2.
2. DUT is alerting. Client 2 displays CLIP information of DUT.
3. DUT displays SS notification "Call is Forwarded" or similar. (SS notification support is network dependent)
4. 2-Way audio / video connection is established.
5. Video call is ended between DUT and Client 2.

45.1.2 Mobile originated Video Call to international B-subscriber (with "+")

Description
The DUT shall correctly make an international video call using a number provided in the international format (using the + prefix)

Related GSM core specifications
3GPP TS 26.112

Reason for test
Use of the + prefix is essential for making international video calls, and for correct use of stored numbers while roaming.

Initial configuration
Client 1 has SIM with same international prefix as DUT.
Client 2 has SIM with different international prefix as DUT.
DUT, Client 1 and Client 2 in idle mode and camping on the same network.
### Test procedure

#### Scenario A: Same Country, Not Stored
1. Delete all entries in DUT phonebook.
2. At DUT, make MO video call to Client 1 using the + international prefix and full international number.
3. At DUT, end video call to Client 1.

#### Scenario B: Same Country, Stored
1. Store Client 1 ADN in DUT phonebook.
2. At DUT, make MO video call to Client 1 using the + international prefix and full international number.
3. At DUT, end video call to Client 1.

#### Scenario C: Different Country, Not Stored
1. Delete all entries in DUT phonebook.
2. At DUT, make MO video call to Client 2 using the + international prefix and full international number.
3. At DUT, end video call to Client 2.

#### Scenario D: Different Country, Stored
1. Store Client 2 ADN in DUT phonebook.
2. At DUT, make MO video call to Client 2 using the + international prefix and full international number.
3. At DUT, end video call to Client 2.

#### Expected behaviour
1. DUT phonebook is updated.
2. Client displays CLIP information of DUT during alerting phase.
   - DUT is alerting.
   - The call is answered at Client.
   - 2-way audio / video is established between DUT and Client.
3. Video call is ended between DUT and Client.

### 45.1.3 Mobile Originated Video Call - Hang up before alerting phase

#### Description
Video call is terminated on DUT before Client is alerting and returns to its initial state.

#### Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

#### Reason for test
To ensure the DUT can successfully terminate a video call before the Client is alerting.

#### Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

#### Test procedure
1. At DUT, make MO video call to Client 1.
2. Before Client 1 is alerting, terminate the video call on DUT by means of the MMI (e.g. pressing the "END" key).
Expected behaviour
1. DUT is initiating a video call to Client 1.
2. DUT returns to its initial state and Client 1 does not indicate any incoming video call.

45.1.4 Mobile Originated Video Call - Hang up during alerting phase

Description
Video call is terminated on DUT while Client is alerting and returns to its initial state.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT can successfully terminate a video call while the Client is alerting.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
1. At DUT, make MO video call to Client 1.
2. While Client 1 is alerting, terminate the video call on DUT by means of the MMI (e.g. pressing the "END" key).

Expected behaviour
1. DUT is initiating a video call to Client 1.
2. DUT returns to its initial state and Client 1 indicates a missed or unanswered video call.

45.1.5 Mobile Originated Video Call - No answer from client

Description
The DUT shall timeout according to the default network value when a video call is not answered by the client.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT terminates the attempted video call setup after the default network timer has been reached.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
1. At DUT, make MO video call to Client 1.
2. Do not answer the incoming call on Client 1.

Expected behaviour
1. DUT is initiating a video call to Client 1.
2. After the default network timer value has been reached, the attempted video call is automatically terminated and the DUT returns to its initial state. The DUT indicates the call was not possible and Client 1 indicates a missed or unanswered video call.

45.1.6 Mobile Originated Video Call - Occupied client

Description
The DUT shall make an outgoing video call to a busy Client and correctly indicate the busy status.
Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
The DUT shall give an indication that the Client is busy.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.

Test procedure

Call Rejected
1. At DUT make MO video call to Client 1.
2. At Client 1 reject the incoming video call directly.

User busy
1. At Client 1, make MO video call to Client 2.
2. At DUT, make MO video call to Client 1.

Expected behaviour

Call rejected
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. Video call is not connected and DUT displays “User Busy” or similar and emits busy tones from the speaker.

User Busy
1. Client 1 is in video call with Client 2.
2. Video call is not connected and DUT displays “User Busy” or similar and emits busy tones from the speaker.

45.1.7 Mobile Originated Video Call - Client not supporting Video Calls

Description
The DUT attempts to make a Video Call to a non-supporting Client.

Related 3GPP core specifications
3GPP TS 26.110 et TS 26.111

Reason for test
The DUT shall display a notification indicating a Video Call is not possible when attempting to make a Video Call to a Client not supporting Video Calls.

Initial configuration
DUT is in Idle mode.

Scenario A: ISDN is used as Client 1.
Scenario B: PSTN is used as Client 1.
Scenario C: PBX is used as Client 1.
Scenario D: Mobile camping to GSM is used as Client 1.

* The below test procedure is applicable to all scenarios

Test procedure
At DUT make MO video call to Client 1.
Expected behaviour
The video call to Client 1 fails and DUT displays a notification that the Client is not supporting video calls. DUT returns to its initial state.

45.1.8  Mobile Originated Video Call - when DUT is Roaming outside its HPLMN

Description
The DUT shall be able to make MO video calls when roaming outside of its HPLMN

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT can make MO video calls when camping outside of its HPLMN.

Initial configuration
DUT is outside its HPLMN (camping on a VPLMN)
Client 1 and Client 2 camping in HPLMN.
DUT, Client 1 and Client 2 in idle mode and camping on the same network.

Test procedure
Normal Call
1. At DUT, make MO video call to Client 1 using the + international prefix and full international number.
2. Answer call on Client 1.
3. At DUT, end video call to Client 1.

Call Forwarding notification check
4. At Client 1, activate Call Forwarding to Client 2.
5. At DUT, make MO video call to Client 1 using the + international prefix and full international number.
6. Check for SS notification on DUT.
7. Answer call on Client 2.
8. At DUT, end video call to Client 2.

Expected behaviour
Normal Call
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established.
3. Video call is ended between DUT and Client 1.

Call Forwarding notification check
4. Call Forwarding is successfully setup from Client 1 to Client 2.
5. DUT is alerting. Client 2 displays CLIP information of DUT.
6. DUT displays SS notification "Call is Forwarded" or similar. (SS notification support is network dependent)
7. 2-Way audio / video connection is established.
8. Video call is ended between DUT and Client 2.
45.2 Mobile Terminated Video Calls

45.2.1 Mobile Terminated Video Call complete

Description
The DUT shall be able to receive an MT video call.

Related 3GPP core specifications
3GPP TS 26.112

Reason for test
To ensure the DUT can successfully receive an MT video call.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.

Test procedure

Normal Call
1. At DUT, receive MT video call from Client 1.
2. Answer call on DUT.
3. At Client 1, end video call to DUT.

Call Forwarding notification check
4. At Client 1, activate Call Forwarding to DUT.
5. At Client 2, make MO video call to Client 1.
6. Check for SS notification on DUT.
7. Answer call on DUT.
8. At Client 2, end video call to DUT.

Expected behaviour

Normal Call
1. DUT is alerting. DUT displays CLIP information of Client 1.
2. 2-Way audio / video connection is established.
3. Video call is ended between DUT and Client 1.

Call Forwarding notification check
4. Call Forwarding is successfully set up from Client 1 to DUT.
5. DUT is alerting. DUT displays CLIP information of Client 2.
6. DUT displays SS notification "Forwarded Call" or similar. (SS notification support is network dependent)
7. 2-Way audio / video connection is established.
8. Video call is ended between DUT and Client 2.

45.2.2 Video Call waiting - MT Video Call during active Video Call

Description
The DUT shall handle a 2nd incoming video call whilst already in a video call.

Related 3GPP core specifications
3GPP TS22.004

Note: 3GPP specifications do not specify Call Hold for Video Call (BS30). Thus, if the incoming call is accepted by the user, pending Video Call should drop.
Reason for test
To ensure the DUT shall handle a 2nd incoming video call whilst already in a video call.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.
Call Waiting is enabled at DUT.

Test procedure
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
3. At DUT, receive MT video call from Client 2.
4. Answer call on DUT.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established with Client 1.
3. DUT is alerting. DUT displays CLIP information of Client 1
4. Depending on DUT implementation, one of the two will happen:
   i) Video call with Client 1 automatically ends when video call with Client 2 is established.
   ii) The call with Client 1 must be ended with the "END" key before the video call with Client 2 can be accepted.

2-Way audio / video connection is established with Client 2.

45.2.3 Video Call waiting - MT Voice Call during active Video Call

Description
The DUT shall handle an incoming voice call whilst already in a video call.

Related 3GPP core specifications
3GPP TS22.004

Note: 3GPP specifications do not specify Call Hold for Video Call (BS30). Thus, if the incoming call is accepted by the user, pending Video Call should drop.

Reason for test
To ensure the DUT shall handle an incoming voice call whilst already in a video call.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.
Call Waiting is enabled at DUT.

Test procedure
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
3. At DUT, receive MT voice call from Client 2.
4. Answer call on DUT.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established with Client 1.
3. DUT is alerting. DUT displays CLIP information of Client 1
4. Depending on DUT implementation, one of the two will happen:
   i) Video call with Client 1 automatically ends when voice call with Client 2 is established.
   ii) The call with Client 1 must be ended with the "END" key before the voice call with Client 2 can be accepted.

   2-Way audio connection is established with Client 2.

45.2.4 Video Call waiting - MT Video Call during active Voice Call

Description
The DUT shall handle an incoming video call whilst in a voice call.

Related 3GPP core specifications
3GPP TS22.004

Reason for test
To ensure the DUT shall handle an incoming video call whilst in a voice call.

Initial configuration
DUT, Client 1 and Client 2 in idle mode and camping on the same network.
Call Waiting is enabled at DUT.

Test procedure
1. At DUT, make MO voice call to Client 1.
2. Answer call on Client 1.
3. At DUT, receive MT video call from Client 2.
4. Answer call on DUT.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio connection is established with Client 1.
3. DUT is alerting. DUT displays CLIP information of Client 1.
4. Depending on DUT implementation, one of the two will happen:
   i) Voice call with Client 1 is automatically held when video call with Client 2 is established.
   ii) Voice call with Client 1 is placed on hold via DUT MMI and the video call with Client 2 is accepted.

   2-Way audio / video connection is established with Client 2.

45.3 Video Calls - Quality of Service, Stability and Setup success

NOTE: In this section, we will consider that good radio conditions are symbolized by 4 or more network bars and bad radio conditions by only 1 network bar on the phone screen.

45.3.1 Video quality - during strong and weak radio conditions

Description
The DUT shall maintain good video quality of service under strong and weak radio conditions.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure DUT maintains good video quality of service under strong and weak radio conditions.
Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
Scenario A: Strong radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.

Scenario B: Weak radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established. The video stream is checked for its quality of service. The quality of the video stream is comparable in strong and weak radio conditions.

45.3.2 Video stability - during strong and weak radio conditions

Description
The DUT shall be able to maintain a video call during strong and weak radio conditions.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT can maintain a video call during strong and weak radio conditions.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
Scenario A: Strong radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1. Maintain the video call for 2 minutes.

Scenario B: Weak radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1. Maintain the video call for 2 minutes.
*Repeat steps 1-2 for up to 5 attempts.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established. The video call does not drop and the video stream is checked for its quality of service throughout the 2 minutes.

45.3.3 Video setup success - during strong and weak radio conditions

Description
The DUT shall be able to setup video calls under strong and weak radio conditions.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111
Reason for test
To ensure DUT can setup video calls under strong and weak radio conditions.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure

Scenario A: Strong radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.

Scenario B: Weak radio condition.
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
*Repeat steps 1-2 for up to 5 attempts.

Expected behaviour
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-Way audio / video connection is established and the number of successful setup attempts in weak radio conditions is comparable to strong radio conditions.

45.3.4 Network Bearer establishment time

Description
The DUT shall be able to setup an MO video call in an acceptable time frame.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT is able to setup an MO video call in an acceptable time frame.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network (in addition special network conditions apply for each scenario).

Test procedure

Scenario A: Same LAU, same cell
1. At DUT, make MO video call to Client 1 camping to the same cell as the DUT.
2. Measure the time from pressing "SEND" to when the DUT is alerting.

Scenario B: Same LAU, different cell.
1. At DUT, make MO video call to Client 1 camping to a different cell but within the same LAU as the DUT.
2. Measure the time from pressing "SEND" to when the DUT is alerting.

Scenario C: Different LAU.
1. At DUT, make MO video call to Client 1 camping to a different LAU to the DUT.
2. Measure the time from pressing "SEND" to when the DUT is alerting.

Expected behaviour
1. DUT initiates MO video call.
2. The time between pressing "SEND" and DUT alerting is comparable to a reference device and similar within the scenarios.
45.3.5 Codec Establishment time

Description
The DUT shall be able to setup an MT video call in an acceptable time frame.

Related 3GPP core specifications
3GPP TS 26.110 and TS 26.111

Reason for test
To ensure the DUT is able to setup an MO video call in an acceptable time frame.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network (in addition special network conditions apply for each scenario).

Test procedure
Scenario A: Same LAU, same cell
1. At DUT, receive MT video call from Client 1 camping to the same cell as the DUT.
2. Measure the time from pressing answer to when the DUT has successful 2-way audio and video setup with Client 1.

Scenario B: Same LAU, different cell.
1. At DUT, receive MT video call from Client 1 camping to a different cell but within the same LAU as the DUT.
2. Measure the time from pressing answer to when the DUT has successful 2-way audio and video setup with Client 1.

Scenario C: Different LAU.
1. At DUT, receive MT video call from Client 1 camping to a different LAU to the DUT.
2. Measure the time from pressing answer to when the DUT has successful 2-way audio and video setup with Client 1.

Expected behaviour
1. DUT is alerting.
2. The time between pressing answer and DUT successfully setting up 2-way audio and video is comparable to a reference device and similar within the scenarios.

45.4 Video Calls - Applications

45.4.1 Muted audio

Description
The DUT shall be able to use the mute audio application during a video call.

Related 3GPP core specifications
3GPP TS 26.110 et TS 26.111

Reason for test
To ensure the DUT is able to use the mute audio application during a video call.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
3. At DUT, mute the audio.
4. At DUT, unmute the audio.
5. At Client 1, mute the audio.
6. At Client 1, unmute the audio.

**Expected behaviour**
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-way audio / video connection is established.
3. At Client 1, there is no audio received from the DUT (1-way audio / 2-way video)
4. At Client 1, there is 2-way audio / video.
5. At DUT, there is no audio received from Client 1 (1-way audio / 2-way video)
6. At DUT, there is 2-way audio / video.

**45.4.2 Blocked video**

**Description**
The DUT shall be able to use the block video application during a video call.

**Related 3GPP core specifications**
3GPP TS 26.110 et TS 26.111

**Reason for test**
To ensure the DUT is able to use the block video application during a video call.

**Initial configuration**
DUT and Client 1 in idle mode and camping on the same network.

**Test procedure**
1. At DUT, make MO video call to Client 1.
2. Answer call on Client 1.
3. At DUT, block the video.
4. At DUT, unblock the video.
5. At Client 1, block the video.
6. At Client 1, unblock the video.

**Expected behaviour**
1. DUT is alerting. Client 1 displays CLIP information of DUT.
2. 2-way audio / video connection is established.
3. At Client 1, there is no video stream received from the DUT (2-way audio / 1-way video)
4. At Client 1, there is 2-way audio / video.
5. At DUT, there is no video stream received from Client 1 (2-way audio / 1-way video)
6. At DUT, there is 2-way audio / video.

**45.4.3 Outgoing / Incoming video stream toggle**

**Description**
The DUT can switch the windows that the outgoing and incoming video streams are displayed in.

**Related 3GPP core specifications**
3GPP TS 26.110 and TS 26.111
Reason for test
To ensure the DUT can switch the windows that the outgoing and incoming video streams are displayed in.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.
DUT Video call settings are prepared so that the incoming video stream will be displayed in the large window and the outgoing video stream will be displayed in the small window.

Test procedure
1. At DUT, make MO video call to Client 1.
2. At DUT MMI, switch the outgoing and incoming video streams.
3. At DUT MMI, switch the outgoing and incoming video streams.
4. At DUT MMI, set to only display incoming video stream.
5. At DUT MMI, set to only display outgoing video stream.

Expected behaviour
1. Video call is established between DUT and Client 1. The outgoing video stream is displayed in the small window and the incoming video stream is displayed in the large window.
2. The outgoing video stream is displayed in the large window and the incoming video stream is displayed in the small window.
3. The outgoing video stream is displayed in the small window and the incoming video stream is displayed in the large window.
4. Only the incoming video stream is displayed.
5. Only the outgoing video stream is displayed.

45.4.4 In call timer

Description
The DUT shall display an In-call timer correctly during a video call.

Related 3GPP core specifications
3GPP TS 26.110 et TS 26.111

Reason for test
To ensure the DUT correctly displays the In-call timer during a video call.

Initial configuration
DUT and Client 1 in idle mode and camping on the same network.

Test procedure
Scenario A: MO Video Call
1. At DUT, make MO video call to Client 1.
2. Remain in call for a period of 1 minute.
3. End video call on DUT.

Scenario B: MT Video Call
1. At DUT, receive MT video call from Client 1.
2. Remain in call for a period of 1 minute.
3. End video call on Client 1.
Expected behaviour
1. Video call is established between DUT and Client 1.
2. In-call timer is correctly displayed on DUT and increments accordingly for the 1 minute.
3. Video call is ended and DUT displays the correct length of time of the video call.

45.4.5 DTMF emission

Description
The DUT can transmit DTMF tones during a video call

Related 3GPP core specifications
3GPP TS 26.110 et TS 26.111

Reason for test
To ensure the DUT can transmit DTMF tones during a video call.

Initial configuration
DUT is in Idle mode.
Client 1 is capable of interpreting DTMF tones (e.g. video mail system).

Test procedure
Scenario A: Direct input
1. Delete all entries in DUT phonebook.
2. At DUT, make MO video call to Client 1.
3. Using DUT keypad, successfully send DTMF tones for digits 0-9, * and #.

Scenario B: From phonebook
1. Store Client 1 ADN in DUT phonebook with a pause, followed by digits 0-9, * and #, e.g. +441111111111P0123456789*#
2. Direct from DUT phonebook, make MO video call to Client 1.
3. Observe the DTMF tones stored after the Pause are sent correctly.

Expected behaviour
1. DUT phonebook is updated.
2. Video call is established between DUT and Client.
3. DTMF tones for digits 0-9, * and # and sent correctly and interpreted by the Client.

46 Java and J2ME

There are two main prevalent versions of Java for mobile phones/devices, J2ME (Java 2 Platform, Micro Edition) CLDC/MIDP (often called kJava) and Personal Java (also called pJava). Personal Java was transferred into the J2ME platform in 1999. The new version is called J2ME CDC/ Personal Profile.

The J2ME CDC/Personal Profile is replacing Personal Java, which has been a popular implementation in high-end devices. The two versions of J2ME are based on a combination of a profile and configuration.

Configurations comprise a virtual machine and a minimal set of class libraries. They provide the base functionality for a particular range of devices that share similar characteristics, such as network connectivity and memory footprint. Currently, there are two J2ME configurations available:

- CLDC (Connected Limited Device Configuration): This configuration is aimed at small, resource constrained devices for instance, mobile phones and pagers.
• **CDC (Connected Device Configuration):** This configuration is aimed at a range of network-connected consumer and embedded devices for instance, smart communicators, PDAs.

To provide a complete runtime environment for a specific device category, a configuration needs to be combined with a profile, a set of higher-level APIs that further define the application life-cycle model, the user interface, and access to device-specific properties. A profile supports a narrower category of devices within the framework of a chosen configuration. The following profiles have been established for J2ME:

- **MIDP (Mobile Information Device Profile):** MIDP is based on the CLDC configuration and provides developers with essential information and guidance when writing programs for mobile phones and two-way pagers.
- **Foundation Profile (FP):** FP is based on CDC configuration and provides a set of Java APIs that support resource-constrained devices without a standard-based GUI system.
- **Personal Basis Profile (PB):** PB along with CDC configuration provides a set of Java APIs that support resource-constrained devices with a standard-based GUI system.
- **Personal Profile (PP):** PP along with the CDC configuration supports resource-constrained devices with a GUI Toolkit based on AWT (Abstract Windowing Toolkit).

### 46.1 Personal Java Devices

Personal Java, which is sometimes called pJava, was one of the first Java programming environments targeted at applications for resource-limited devices. These devices include for instance PDAs (Personal Digital Assistants) and Communicators/Smartphones. Personal Java introduced features that reduce memory usage and adapt applications to different screens and graphical interfaces.

High-end phones such as Smartphones based on the Symbian OS offer this advanced capability to develop feature-rich applications in Java. In addition to Personal Java, these devices also utilize JavaPhone to get access to the phone functionality. It is mandatory to support the JavaPhone API for Personal Java Devices.

#### 46.1.1 Personal Java Application Installation

**Description**

Personal Java devices shall support the JAR file manifest entries as described in the JavaPhone specification.

**Related Java specifications**

Connected Device Configuration (JSR 36) and JavaPhone API

**Reason for test**

To ensure that a UE supports the following JAR file manifest entries:

- Implementation-Title
- Main-Icon
- Main-Class
- Class Path.

**Initial configuration**

The UE needs to have enough available memory to install the java application.

**Test procedure**

Download a Personal Java application and verify that the required JAR file manifest entries are supported.

**Expected behaviour**

The following JAR file manifest entries shall be supported after the application is installed on UE.

Implementation-Title:
The Implementation-Title shall be used in any textual description of the application, which is displayed in the UI element used to launch the application. E.g. the text displayed with an icon.

Main-Icon:

The use of icons to launch applications is optional, however if icons are used as elements to launch the application, then the icon file within the JAR file named by the Main-Icon attribute shall be displayed, and may be scaled if desired.

Main-Class and Class-Path:

When the application is launched, the Personal Java VM shall be supplied with the class path and shall call the main () method in the class named by the Main-Class attribute.

46.1.2 Power Monitor

Description

Personal Java devices shall support the Power Monitor package (javax.power.monitor) as specified by the JavaPhone API to access the power level of the device and receive notifications concerning changes in power states.

Related Java specifications

Connected Device Configuration (JSR 36) and JavaPhone API

Reason for test

To ensure the UE supports the Power Monitor package (javax.power.monitor).

Initial configuration

The UE battery level is initially on a critical level.

Test procedure

Note that the Power Monitor package does not specify the minimum required events that should be generated under certain circumstances. Personal Java devices shall at least implement the following event generation:

1. BatteryCritical (Shall be generated when the battery is at a critically low level)
2. BatteryNormal (Shall be generated when the battery is no longer low)

All the other event generation should be supported by the implementation.

Verify that the BatteryCritical event is generated when the UE battery level is on a critical level (close to zero). Do also verify that the BatteryNormal event is generated when the UE battery level is changing from critical to non-critical. Charging the battery to a normal level can do this.

Expected behaviour

The Critical and the Normal Battery event shall be generated when the battery level is changing from normal to critical and from critical to normal.

46.1.3 Personal Java Network Protocol Support

Description

Personal Java devices shall support the network protocols HTTP/1.1, HTTPS and MAILTO.

Gopher, FTP and File are optional network protocols.

Related Java specifications

Connected Device Configuration (JSR 36) and JavaPhone API

Reason for test

To ensure that a UE supports the mandatory network protocols.
Initial configuration
The device must be configured with the necessary connection parameters. Personal Java application(s) using the mandatory network protocols must be installed.

Test procedure
Start the Personal Java application setting up connection using
1. HTTP
2. HTTPS
3. MAILTO
Verify that the device supports these three network protocols. Note that it may be necessary to run different Personal Java applications to test the different network protocols.

Expected behaviour
The Personal Java application(s) shall request the user before setting up a HTTP, HTTPS and MAILTO session. The testing device shall support the three network protocols (HTTP, HTTPS and MAILTO protocols).

46.1.4 Personal Java Capability Negotiation

Description
In Personal Java devices the retrieval shall be carried over by using download with capability negotiation headers (CC/PP and UAPROF) over HTTP and optionally download with capability negotiation headers (CC/PP and UAPROF) over WSP.

Related Java specifications
Connected Device Configuration (JSR 36) and JavaPhone API

Reason for test
To ensure the UE supports CC/PP negotiation over the mandatory network protocols and that the appropriate Java capabilities are communicated.

In addition to the mandatory attributes, the device shall communicate the JavaPlatform and version (e.g. “Pjava/1.1.3-compatible”) attributes supported.

Initial configuration
Ensure that the device is configured with the necessary network parameters and that Personal Java is supported.

Test procedure
Browse for a Personal Java application and select an application for retrieval. The retrieval shall be carried over by using CC/PP over HTTP and optionally CC/PP over WSP.
Verify that the PersonalJava attributes are communicated. E.g. trying to download a J2ME MIDP application should not be allowed. This shall be avoided by the device communication its Java capabilities.

Expected behaviour
The device shall communicate the content capabilities to ensure that the device supports the downloaded java content.

46.2 J2ME CLDC/MIDP Devices

J2ME CLDC/MIDP devices are based on the Connected Limited Device Configuration (CLDC) with the Mobile Information Device Profile (MIDP). During 2003 an initiative was started to ensure interoperability in J2ME. The initiative is called "Java Technology for the Wireless Industry" JTWI also referred to as JSR-185. The initiative works to define a roadmap for MIDP/CLDC enabled mobile phones and to reduce any ambiguity in the specifications included.

The (mandatory) JSRs that are supported for JTWI (JSR 185) are:
46.2.1 Retrieval of new MIDlet over Wireless Network

46.2.1.1 Retrieval of new unsigned MIDlet over Wireless Network

Description
A browser installed on a J2ME CLDC/MIDP device should support MIME type text/vnd.sun.j2me.app-descriptor. This support allows the user to browse and discover a Java application, which then can be downloaded.

A JAD file can be downloaded and used to determine if the MIDlet is suitable for download and installation. If it is suitable, the JAR file can be downloaded and installed. If not, the J2ME CLDC/MIDP device should be able to prompt the user so that the user might choose to take actions such as deletion of some existing applications if there is not enough memory to install the new application. If the application to be installed already exists on the device, the user should be notified so that further actions as either to download the chosen version or to retain existing one.

Connected Device Configuration (JSR 36) and JavaPhone API The retrieval shall be carried over by using download with capability negotiation headers (CC/PP and UAPROF) over HTTP and optionally download with capability negotiation headers (CC/PP and UAPROF) over WSP.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the user can browse and discover Java applications via UE browser, retrieve MIDlets and that the MIDlets are correct handled by UE.

Initial configuration
The UE must be configured with CS or PS data connection.

Note: It is allowed to use another connection for retrieval of the MIDlet that the one used for the WAP session.

Test procedure
Browse for MIDlets using UE browser and select a MIDlet for retrieval. The retrieval shall be carried over by using download with capability negotiation headers (CC/PP and UAPROF) over HTTP and optionally download with capability negotiation headers (CC/PP and UAPROF) over WSP.

Verify that the MIDlet is retrieved.

Expected behaviour
The UE shall retrieve the selected MIDlet. The user should be able to either launch the MIDlet immediately or later.

46.2.1.2 Retrieval of new signed MIDlet over Wireless Network

Description
In order to be able to identify the origin of a MIDlet, the JAD file can be signed using a X.509 PKI certificate, thus proving the origin of the associated JAR file and ensuring that the file has not been altered. Furthermore, depending on the settings of the device, a corresponding security policy is applied on the application when correctly installed.

Applications wishing to use one or more restricted APIs on the phone should request permission for this both in the JAD file and in the corresponding signed JAR file. Permissions can be requested either as optional or as required.
A MIDlet can be signed with multiple certificates simultaneously as a fallback to ensure that the MIDlet can be installed, even though the first choice of root certificate would not exist in the device, (U)SIM or WIM.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile version 2 (JSR-118) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the user can retrieve signed MIDlets and that signed MIDlets are correct handled by UE.

Initial configuration
Find a MIDlet for retrieval, which has been signed with two certificates, where the first certificate chain does not belong to a certificate chain recognized by the device, but the second certificate has an origin in a root certificate available on the device or the (U)SIM or WIM.

The UE must be configured with CS or PS data connection, and the date and time of the device must be set to one that is within the validity period of the working certificate.

Test procedure
Browse for MIDlets using UE browser and select a MIDlet for retrieval which has been signed with two certificates, where the first certificate chain does not belong to a certificate chain recognized by the device, but the second certificate has an origin in a root certificate available on the device or the (U)SIM or WIM.

Verify that the MIDlet is retrieved.
Start the application, and verify that the MIDlet has access to the optional and required APIs requested according to the protection domain in the device associated with the signing certificate of the MIDlet.

Expected behaviour
The UE shall retrieve the selected MIDlet. When installing the MIDlet, the user shall be presented with the origin of the MIDlet as defined in the Subject field of the signing certificate. The user should be able to either launch the MIDlet immediately or later. The permissions for APIs requested by the MIDlet shall be available for use according to the protection domain in the device associated with the signing certificate of the MIDlet.

46.2.2 Retrieval of new MIDlet over non network interfaces

Description
Retrieval of MIDlet can be carried over using different interfaces like infrared, Bluetooth, cable and/or memory cards.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To test retrieval of MIDlets using the different type of interfaces supported by the UE.

Initial configuration
The UE may support retrieval of MIDlets over different types of interfaces. E.g. a device with memory card slot should also support retrieval of MIDlet via memory cards.

Test procedure
Provide the UE with MIDlet over the following interfaces and verify that the MIDlet is retrieved:
   a) Infrared interface
   b) Bluetooth interface
Expected behaviour
The UE shall retrieve the selected MIDlet. The user should be able to either launch the MIDlet immediately or later.

46.2.3 Retrieval of MIDlet without enough memory space on UE

Description
A browser installed on a J2ME device should support MIME type text/vnd.sun.j2me.app-descriptor. This support allows the user to browse and discover a Java application, which then can be downloaded.

A JAD file can be downloaded and used to determine if the MIDlet is suitable for download and installation. If it is suitable, the JAR file can be downloaded and installed. If not, the Java device should be able to prompt the user so that the user might choose to take actions such as deletion of some existing applications if there is not enough memory to install the new application. If the application to be installed already exists on the device, the user should be notified so that further actions as either to download the chosen version or to retain existing one.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the user can choose to take actions such as deletion of some existing applications if there is not enough memory to install the new application

Initial configuration
To perform this test case, make sure that the UE has not enough memory to install the selected MIDlet.

Test procedure
Browse for a MIDlet using UE browser and select a MIDlet for retrieval. The retrieval shall be carried over by using download with capability negotiation headers (CC/PP and UAPROF) over HTTP or download with capability negotiation headers (CC/PP and UAPROF) over WSP.

Verify that the user can choose to take actions such as deletion of some existing applications when there is not enough memory to install the new application

Expected behaviour
The UE shall prompt the user that there is not available memory space to install the selected MIDlet and give the user the choice to take such actions as deletion of existing application to install the MIDlet.

The user should be able to either launch the MIDlet immediately or later after retrieval.

46.2.4 Retrieval of MIDlet that already exists on UE

Description
A browser installed on a J2ME device should support MIME type text/vnd.sun.j2me.app-descriptor. This support allows the user to browse and discover a Java application, which then can be downloaded.

A JAD file can be downloaded and used to determine if the MIDlet is suitable for download and installation. If it is suitable, the JAR file can be downloaded and installed. If not, the J2ME device should be able to prompt the user so that the user might choose to take actions such as deletion of some existing applications if there is not enough memory to install the new application. If the application to be installed already exists on the device, the user should be notified so that further actions as either to download the chosen version or to retain existing one.
Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the user is notified so that the user can take further actions either to download the chosen version or to retain the existing one.

Initial configuration
[tbd.]

Test procedure
Browse for a MIDlet using J2ME browser and select a MIDlet for retrieval. The MIDlet shall be installed on the J2ME. Then browse for the same MIDlet and select it again for retrieval.
Verify that the user is notified so that the user can take further actions either to download the chosen version or to retain the existing MIDlet.

46.2.5 MIDlet Management Software

Description
The MIDlet management software handles the device-specific functions for installing, execution, and removal of MIDlets. The application management software installs or upgrades a MIDlet by examining the application descriptor and the corresponding JAR file.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that installation, execution and un-installation of MIDlets are correct handled by UE.

Initial configuration
To perform this test case, make sure that the UE has no pre-installed MIDlets.

Test procedure
Establish a connection to the MIDlet source via serial cable, IRDA port or wireless network. Select the MIDlet for download and verify that the MIDlet is installed.

By the MIDlet Management Software, select the installed MIDlet and verify that the Management Software provides MIDlet information as MIDlet-Name, MIDlet-Version, MIDlet-Vendor and MIDlet-size.

Delete the downloaded MIDlet and verify that the Management Software confirm with the user for approval before deleting the selected MIDlet.

Expected behaviour
The MIDlet Management Software shall confirm with the user for approval before downloading and details about the MIDlet shall be available before download and installation.

MIDlet information shall be available from the MIDlet Management Software.

The MIDlet Management Software shall confirm with the user for approval before deleting the selected MIDlet.

46.2.6 MIDlet requesting online information

Description
MIDlet through the device GUI notifies the user when it sets up an online data connection
Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37), Mobile Information Device Profile v2 (JSR-118), Mobile Media API (JSR-135) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the MIDlet notifies the user when it sets up an online data connection and that online connections from a MIDlet work. Connections from a MIDlet include

- HTTP connection
- HTTPS connection
- Socket connection
- RTSP streaming connection

Initial configuration
Find a MIDlet that uses online connection or connections of the type to be tested. Make sure that the subscription used has no restrictions preventing access to the network.

Test procedure
Install a MIDlet that demands online data connection to send/receive updated information.

Expected behaviour
The MIDlet shall inform the user through the UE GUI that it demands an online data connection and conform if the user wants this or not. If the user selects that no data connection is set up, no data connections shall be set up. An online data connection shall only be set up by the UE if the user accepts this according to the security policy of the MIDlet where applicable.

46.2.7 Receiving Voice Call during CS download of MIDlet

Description
Handling of incoming voice calls during CSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper CS download of MIDlet and proper handling of incoming voice call during download of MIDlet.

Initial configuration
The UE must be configured with CSD connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off. When downloading MIDlet, from another phone initiate a mobile-terminated (MT) voice call.

The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start to download the MIDlet. During the download, initiate a mobile terminated (MT) voice call from another phone. Verify that the UE either terminates the download to accept the incoming voice call or rejects the voice call to continue the download.

Expected behaviour
Please note that it is not allowed to place a CS data session on hold, so it is acceptable for the terminal to automatically reject the incoming voice call. It is also acceptable if it is possible to reject an incoming voice call (and continue the data-session uninterrupted) or to accept the voice call without terminal crash (the data-session must be terminated).
46.2.8 Receiving SMS during CS download of MIDlet

Description
Handling of incoming SMSs during CSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper CS download of MIDlet and proper handling of incoming SMS during download of MIDlet.

Initial configuration
The UE must be configured with CS D connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start to download the MIDlet. During the download, send a SMS to the UE under test.

Expected behaviour
Verify that the UE receives the incoming SMS and that the download of the MIDlet is performed successfully. Ideally the user is informed with minimum disturbance that he/she has received a SMS.

46.2.9 Receiving MMS during CS download of MIDlet

Description
Handling of incoming MMS during CSD MIDlet download

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper download of MIDlet and proper handling of incoming MMS during download of MIDlet.

Initial configuration
The UE should be configured with CS connection for the MIDlet download and PS connection for the MMS download. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet and the MMS.

Test procedure
Browse for a MIDlet to download and start to download the MIDlet. During the download, send a MMS to the UE under test.

Expected behaviour
Verify that the MIDlet is successfully downloaded and that the MMS is successfully received during or after the download of the MIDlet is fulfilled. Ideally the user is informed with minimum disturbance that he/she has received a MMS.

46.2.10 Receiving SAT Message during CS download of MIDlet

Description
Handling of incoming SAT messages (SMS) during CSD MIDlet download.
Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry-JTWI (JSR 185)

Reason for test
To ensure proper CS download of MIDlet and proper handling of incoming STK messages during download of MIDlet.

Initial configuration
The UE must be configured with CS connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start the download the MIDlet. During the download, send STK message to the UE under test.

Expected behaviour
Verify that the UE receives and displays the STK message with minimum disturbance for the user and that the MIDlet download is performed successfully.

46.2.11 Receiving CB Message during CS download of MIDlet

Description
Handling of incoming CB message during CSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry-JTWI (JSR 185)

Reason for test
To ensure proper CS download of MIDlet and proper handling of incoming CB messages during download of MIDlet.

Initial configuration
The UE must be configured with CS connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start the download the MIDlet. During the download, send a CB message to the UE under test.

Expected behaviour
Verify that the UE receives the CB message and that the download of the MIDlet is performed successfully. Ideally the user is notified that he/she has received a CB message with minimum disturbance.

46.2.12 Receiving Voice Call during PS download of MIDlet

Description
Handling of incoming voice calls during PSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry-JTWI (JSR 185)
Reason for test
To ensure proper PS download of MIDlet and handling of incoming voice call during download of MIDlet.

Initial configuration
The UE must be configured with PSD connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.
The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start to download the MIDlet. During the download, initiate a mobile terminated (MT) voice call from another phone. Verify that the user is allowed to accept the incoming call.

Expected behaviour
Verify that the user will not lose the possibility to accept an incoming call while using the PS data service and that the user can resume the download session after ended voice call.

46.2.13 Receiving SMS during PS download of MIDlet
Description
Handling of incoming SMS during PSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper PS download of MIDlet and handling of incoming SMS during PS download of MIDlet.

Initial configuration
The UE must be configured with PSD connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.
The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start to download the MIDlet. During the download, send a SMS to the UE under test.

Expected behaviour
Verify that the UE receives the incoming SMS and that the MIDlet download is performed successfully. Ideally the user is notified with minimum disturbance that he/she has received a SMS.

46.2.14 Receiving MMS during PS Download of MIDlet
Description
Handling of incoming MMS during PSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper PS download of MIDlet and handling of incoming MMS during download of MIDlet.
Initial configuration
The UE must be configured with PSD connection both for MIDlet download and MMS reception. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet and the MMS.

Test procedure
Browse for a MIDlet to download and start the download the MIDlet. During the download, send a MMS to the UE under test.

Expected behaviour
Depending on the UE’s number of supported active PDP contexts, verify that the MIDlet is successful downloaded and that the MMS is downloaded simultaneously or after the download of the MIDlet. Ideally the user is notified with minimum disturbance that he/she has received a MMS without

46.2.15 Receiving SAT Message during PS Download of MIDlet

Description
Handling of incoming SAT messages (SMS) during PSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper PS download of MIDlet and handling of incoming STK messages during download of MIDlet.

Initial configuration
The UE must be configured with PSD connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet.

Test procedure
Browse for a MIDlet to download and start the download the MIDlet. During the download, send STK message to the UE under test.

Expected behaviour
Verify that the UE receives and displays the STK message and that the download of the MIDlet is performed successfully.

46.2.16 Receiving CB Message during PS Download of MIDlet

Description
Handling of incoming CB messages during PSD MIDlet download.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper PS download of MIDlet and handling of incoming CB messages during download of MIDlet.

Initial configuration
The UE must be configured with PSD connection. Make sure the Call Waiting service is activated for data services and that the Call Divert when Busy is switched off.

The UE must also have enough memory space available for download of the MIDlet.
Test procedure
Browse for a MIDlet to download and start the download the MIDlet. During the download, send a CB message to the UE under test.

Expected behaviour
Verify that the UE receives the CB message and that the download of the MIDlet is performed successfully. Ideally the user is informed with minimum disturbance that he/she has received CB message.

46.2.17 Receiving Voice Call while running MIDlet
Description
Handling of incoming voice calls while running MIDlet.
Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37), Mobile Media API (JSR-135) and Java Technology for the Wireless Industry- JTWI (JSR 185)
Reason for test
To ensure that incoming voice calls are properly handled while running MIDlet.
Initial configuration
Make sure the Call Divert when Busy is switched off and that the UE contains a pre-installed MIDlet that can provide the situation to be tested.
Test procedure
Launch a pre-installed MIDlet and from another phone initiate a mobile terminated (MT) voice call to the UE under test. Repeat the test with and without streaming audio&video from within the MIDlet.
Expected behaviour
Verify that the user will not lose the possibility to accept an incoming voice call while running the MIDlet and that the user can resume the MIDlet after ended voice call.
Note, that in a GSM network using general mode 1, incoming calls may be blocked in case the MIDlet uses network access.

46.2.18 Receiving SMS while running MIDlet
Description
Handling of incoming SMS while running MIDlet.
Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)
Reason for test
To ensure incoming SMSs are properly handled while running MIDlet(s).
Initial configuration
The UE must be set up with correct messaging service.
Test procedure
Launch a pre-installed MIDlet and from another phone send a SMS to the UE under test.
Expected behaviour
Verify that the UE receives the incoming SMS. Ideally the user is informed with minimum disturbance that he/she has received a SMS. If the user gets the option to read the SMS while running the MIDlet, the user should resume the MIDlet after closing the SMS client.
46.2.19 Receiving MMS while running MIDlet

Description
Handling of incoming MMS while running MIDlet.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure MMSs are properly received while running MIDlet(s).

Initial configuration
The UE must be configured for MMS reception.

Test procedure
Launch a pre-installed MIDlet and send a MMS to the UE under test.

Expected behaviour
Verify that running the MIDlet do not impacting the MMS download and that the MMS is received successfully. Ideally the user is informed with minimum disturbance that he/she has received the MMS. If the user gets the option to read the MMS while running the MIDlet, the user should resume the MIDlet after closing the MMS client.

46.2.20 Receiving SAT Message while running MIDlet

Description
Handling of incoming SAT messages (SMS) while running MIDlet.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure properly receptions of STK message while running MIDlet(s).

Initial configuration
[tbd.]

Test procedure
Launch a pre-installed MIDlet and send STK message to the UE under test.

Expected behaviour
Verify that the UE receives and displays the STK message while running the MIDlet and that the user can resume the MIDlet after ending the STK dialog.

46.2.21 Receiving CB Message while running MIDlet

Description
Handling of incoming CB message while running MIDlet.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure properly receptions of CB messages while running MIDlet(s).

Initial configuration
[tbd.]
Test procedure
Launch a pre-installed MIDlet and send a CB message to the UE under test.

Expected behaviour
Verify that the UE receives the CB message while running the MIDlet. Ideally the user is informed with minimum disturbance that he/she has received a CB message. If the user gets the option the read the CB message while running MIDlet, the user should resume the MIDlet after closing the CB client.

46.2.22 Running a Multiplayer MIDlet requesting information over different interfaces

Description
Exchange of information between two multiplayer MIDlets.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile (JSR-37) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure proper exchange of information between two multiplayer MIDlets exchanging information over the available interface:

- Cable
- Infrared
- Bluetooth
- Other

Initial configuration
A multiplayer MIDlet must be pre-installed or downloaded to perform the test.

A second device with the multiplayer MIDlet must be used as the second multiplayer source. This device must support the same interface as the UE under test.

Test procedure
Launch a pre-installed multiplayer MIDlet and select to start the MIDlet with two players. Do also launch the second multiplayer MIDlet. The MIDlet on the UE under test should provide action to select the preferred interface for communication between the two running multiplayer MIDlets. When the interface is selected, verify that multiplayer information is exchanged properly between the two MIDlets.

Expected behaviour
Verify that the employed interface(s) provide a proper communication channel for information exchange between the multiplayer MIDlets.

46.2.23 Remote wakeup of MIDlet though SMS

Description
Mobile Information Device Profile version 2 (JSR-118) defines a way to activate and interact with MIDlets through SMS messages by setting the MIDlet up for receiving SMS messages on a certain port.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile version 2 (JSR-118) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that the UE will correctly handle invoking of MIDlets via SMS.
Initial configuration
Find a MIDlet for retrieval, which uses the Push Registry to define interaction with the MIDlet through incoming SMS on some certain port.

Find a means to send SMS messages to a specific SMS port like a special MIDlet or a network service providing this functionality.

Test procedure
Send a SMS to the handset on the defined port. Verify that the application wakes up, and can receive the message.

Expected behaviour
The UE shall start the selected MIDlet and allow it to read the SMS, provided that the permissions required for this have been or are granted according to the applicable security policy.

46.2.24 Operation of MIDlet requiring continued access to UI

Description
When a device is inactive or an application running in the device does not require use of the UI, the application environment may want to turn off the screen in order to save energy. However, certain applications may need to be able to keep the user interface visible to the user at long times, or alert the user using visible flashing of the screen backlight. Examples of such applications could be Mobile Video streaming applications, navigation software, instant messaging software or applications for hearing disabled users.

When the application specifically request the screen backlight of the device to be flashed, turned on or kept on, either through standard methods or through other means (proprietary API), the screensaver must not interfere with the purpose.

Related Java specifications
Connected Limited Device Configuration (JSR-30), Mobile Information Device Profile version 2 (JSR-118) and Java Technology for the Wireless Industry- JTWI (JSR 185)

Reason for test
To ensure that an active application needing to enable or keep the screen backlight on for some specific reason can do so without interference.

Initial configuration
Find a MIDlet for retrieval, which specifically request the screen backlight of the device to be flashed, turned on or kept on, either through standard methods or through other means (proprietary API), like for instance a video streaming MIDlet.

Test procedure
Install the MIDlet into the device. Start the MIDlet, and verify that the screensaver is not turned on while the video is being streamed.

Expected behaviour
Any screen blanking or screen saving functionality of the device shall not be activated while the application is specifically requesting that the backlight is kept on or flashed.

46.3 Security and Trust Services API for J2ME (SATSA); JSR 177

46.3.1 SATSA-APDU

Description
Procedure for testing support of SATSA-APDU package.

Related 3GPP/ETSI core specifications
J2ME: SATSA 1.0, (JSR 177)
Reason for test
To ensure that the UE uses properly SATSA-APDU package for UICC resources accessing.

Initial configuration
1. UE with a MIDlet that sends data to a (U)SAT application available on the UICC.
2. UE with a MIDlet accessing smart card resources through APDU package on the channel 1. UICC with a Java Card application containing some data.

Test procedure
User executes the MIDlet on the UE.

Expected behaviour
1. (U)SAT application receives data from MIDlet.
2. MIDlet opens communication with cardlet and the information retrieved is displayed on the handset screen.

46.3.2 SATSA-CRYPTO

Description
Procedure for testing support of SATSA-Crypto package.

Related 3GPP/ETSI core specifications
J2ME: SATSA 1.0, (JSR 177)

Reason for test
To ensure that the UE uses properly SATSA-Crypto package accessing UICC resources on the channel 2.

Initial configuration
UE with a MIDlet requesting smart card crypto resources (data ciphering). UICC supporting crypto capabilities.

Test procedure
User executes the MIDlet on the UE.

Expected behaviour
MIDlet opens communication with cardlet and crypto process (i.e. ciphering) is executed.

46.3.3 SATSA-PKI

Description
Procedure for testing support of SATSA-PKI package.

Related 3GPP/ETSI core specifications
J2ME: SATSA 1.0, (JSR 177)

Reason for test
To ensure that the UE uses properly SATSA-PKI package for UICC resources accessing.

Initial configuration
UE with a MIDlet requesting PKI resources on the smart card (i.e. adding user credentials) channel 3. UICC with PKI capabilities.

Test procedure
User executes the MIDlet on the UE.
Expected behaviour
MiDlet opens communication with cardlet and PKI procedures are executed (i.e. credentials are added).

46.3.4 SATSA-RMI
Description
Procedure for testing support of SATSA-RMI package.
Related 3GPP/ETSI core specifications
J2ME: SATSA 1.0, (JSR 177)
Reason for test
To ensure that the UE uses properly SATSA-RMI package for UICC resources accessing.
Initial configuration
UE with a MIDlet accessing smart card resources through RMI invocation on channel 4. UICC with a Java Card RMI application.
Test procedure
User executes the MIDlet on the UE.
Expected behaviour
MiDlet opens communication with cardlet and smart card methods are executed.

47 Streaming
47.1 Basic Functionalities
47.1.1 Opening from the terminal Menu
Description
The Streaming client is able to manage and play locally stored contents, without opening a browsing session.
Related 3GPP core specifications
[tbd.]
Reason for test
The ensure that it is possible to launch the Media Player directly from the terminal menu to access locally stored files, without opening a browsing session.
Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. UE shall have a clip stored.
Test procedure
• Open the Media Player.
• Play a locally stored clip.
Expected behaviour
It is possible to select and play locally stored clips
47.1.2 Local and remote video clip access

Description
The Streaming client is able to manage and play local and remote contents.

Related core specifications
[tbd.]

Reason for test
To ensure that the Media Player has ability to Open Location (local and remote) and Open File (local and remote).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
- Open the Media Player
- Browse from Media Player for a locally stored file and play it
- Browse from Media Player for a remotely stored file and play it

Expected Behaviour
The UE should in both cases (local and remote) the Media Player should be able to open and play the selected files.

47.1.3 URL Address

Description
The purpose is to verify that the Media Player allows the user to manually enter a URL as a content address.

Related core specifications
[tbd.]

Reason for test
To ensure that the Streaming client is able to manage manually written URLs to play remote contents.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be carried out as follows:
1. Open the Media Player.
2. Enter a http URL addressing an SDP content.
3. Play the clip
4. Enter a rtsp URL as a content address
5. Play the clip

Expected Behaviour
3. & 5. The clip is correctly played.

47.1.4 RTSP and HTTP URLs support

Description
The Media Player supports both rtsp and http URLs to access streams.
Related core specifications
[tbd.]

Reason for test
To ensure that the Media Player supports the recognition of rtsp and http URLs to obtain presentation description (e.g. using bookmarks).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be carried out as follows:
1. Open the Media Player.
2. Use an rtsp link to open a stream.
3. Use a http link to open a SDP presentation file.

Expected Behaviour
2., 3. The Media Player opens and plays correctly the stream

47.1.5 Long URLs support

Description
It is possible to access and stream or play (with progressive download, if supported) clips using URLs. When http and/or rtsp links are supported, it must be possible to use links long up to 512 characters.

Related GSM core specifications
[tbd.]

Reason for test
To ensure that the Browser and/or the Media player support the recognition of rtsp and http URLs long up to 512 characters in the following cases:
- rtsp link addressing to a media stream
- http link addressing to a SDP file
- http link addressing to the media content (progressive download)

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and/or the Browser
2. Use each above link (if supported by the platform and by the handset) to open a media stream
3. Play the presentation

Expected Behaviour
In 2., 3. The Media Player and/or the Browser open and play the stream without errors or abnormal behaviours

47.1.6 Automatic playback

Description
The Streaming client is able to automatically start the playing of a selected clip.

Related GSM core specifications
[tbd.]
Reason for test
To ensure that upon invocation by the user or file type association, the Media Player automatically start rendering the media for playback.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:

1. Open the Media Player.
2. Select a clip for playing (local or remote).

Expected Behaviour
The Media Player should open and automatically play the selected clip.

47.1.7 Exit directly from the playback

Description
The Media Player and the capture UI support direct exit.

Related GSM core specifications
[tbd.]

Reason for test
To ensure that it is possible to exit the Media Player directly from the playback or capture UI.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:

1. Open the Media Player.
2. Select a clip for playing.
3. Exit the Media Player while streaming a clip.
4. Open the capture UI.
5. Exit the capture UI.

Expected Behaviour
In 3. It is possible to exit directly from the Media Player while playing a clip.
In 5. It is possible to exit directly from the capture UI.

47.1.8 Playlist

Description
The Media Player should provide support for Playlist creation and management.

Related GSM core specifications
[tbd.]

Reason for test
To ensure that the Media Player provides support for a Playlists.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.
Test procedure
Where possible, this procedure should be repeated as follows:

1. Open the Media Player.
2. Create a Playlist based on both local and remote contents.
3. Use the previously created Playlist to access contents.

Expected Behaviour
In 2. It is possible to create a personal Playlist.
In 3. It is possible to access and play the contents through the Playlist

47.1.9 Predefined page
Description
The Media Player must manage correctly predefined pages.

Related core specifications
[tbd.]

Reason for test
To ensure that Media Player supports the viewing of a predefined local WML/XHTML page (if present and in accordance with device Browser support) via the Media Player Options menu.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. Predefined page.

Test procedure
Where possible, this procedure should be carried out as follows:

1. Open the Media Player.
2. Choose from the option menu a predefined page, if present.

Expected Behaviour
The handset under test opens the predefined chosen page.

47.1.10 Bookmarks management
Description
The Media Player is able to manage bookmarks without errors or strange behaviours.

Related core specifications
[tbd.]

Reason for test
To ensure that the Media Player supports the addition and utilization of bookmarks.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be carried out as follows:

1. Open the Media Player.
2. Add a bookmark to an existing stream.
3. Use the bookmark menu to access the previously added stream.
4. Delete the previously added bookmark.
Expected Behaviour
In 2. The Media Player supports bookmarks addition.
In 3. The Media Player supports content access from bookmarks
In 4. The Media Player supports bookmarks deletion

47.1.11 Media Player closure

Description
The Media Player correctly handles invocation by other application and the control return when closed.

Related core specifications
[tbd.]

Reason for test
To ensure that when the Media Player has been invoked by another application (e.g. browser), it should close automatically and give the control back to the calling application after the requested operation (e.g. file play) has been carried out.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be carried out as follows:
1. Open the browser and select a clip to play.
2. Wait until the end of the clip between cells not sharing a Location Area.

Expected Behaviour
In 1. The Media Player should play the clip, invoked from the browser
In 2. When the end of the clip is reached, the Media Player is automatically closed and the user should be returned to the browser

47.1.12 Speakers

Description
The handset is able to manage correctly the use of the headset.

Related core specifications
[tbd.]

Reason for test
To ensure that when a headset (or peripheral speakers) is attached, the terminal speakers are muted.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be carried out as follows:
1. Connect a headset to the handset.
2. Start a streaming clip.

Expected Behaviour
The terminal speakers are muted and audio contents can be listened only through the headset.
47.1.13 Silent mode-meeting profile

Description
The audio content is not played when silent mode-meeting profile is set.

Related GSM core specifications
3GPP TS25.304

Reason for test
To ensure that, when the terminal is set to Silent or Meeting modes, the Media Player audio is muted.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:

- Set 'meeting' profile (or its equivalent on the terminal under test).
- Open the Media Player and presentation containing audio

Expected Behaviour
The audio content of the presentation should not be played.

47.1.14 Buffer status

Description
The user is aware of the time (or percentage) he has to wait before the play starts.

Related GSM core specifications
[tbd.]

Reason for test
To ensure that during streaming, the Media Player displays the total duration and elapsed time (or percentage) of the buffer to make customer aware how long he will have to wait before the play starts.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:

- Open the Media Player and browse for a remote presentation (preferably with a high bit rate).
- Play the presentation.

Expected Behaviour
During the buffer loading, before the play of the presentation, the Media Player shows the user the total duration and elapsed time (or percentage) of the buffer.

47.2 Service Priorities

47.2.1 Incoming voice call with activated Media Player

Description
The user is notified of an incoming call and given the option to either skip or accept the call. When the received call is closed or rejected, the control is returned to the Media Player.

Related GSM core specifications
[tbd.]
Reason for test
To ensure that, the activation of Media Player doesn't preclude the ability of the user to receive a voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the Media Player but do not start streaming a clip
2. Receive and accept a voice call
3. Close the received voice call
4. Receive and reject another voice call

Expected Behaviour
In 2. It is possible to accept the call
In 3. Closing the call, the control is returned to the Media Player
In 4. Rejecting the call, the control is returned to the Media Player

47.2.2 Incoming voice call during streaming: accept and close

Description
The user is notified of an incoming call and given the option to either skip or accept the call. When the call is accepted the streaming is, preferably, automatically paused. When the call is closed, the control is returned to the Media Player and the user is able to start streaming from the pause point.

Related GSM core specifications
[tbd.]

Reason for test
To verify that the streaming activity of Media Player doesn't preclude the ability of the user to receive, accept and close an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call. This is a mandatory requirement.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip
2. Receive and accept a voice call while streaming is active
3. Close the received voice call
4. Resume the streaming activity

Expected Behaviour
In 2. The streaming is, preferably, automatically paused and it is possible to accept the incoming call.
In 3. The voice call is closed and the control is returned to the Media Player.
In 4. Resume the streaming activity.

47.2.3 Incoming voice call during streaming: reject

Description
The user is notified of an incoming call and given the option to either skip or accept the call. When the call is rejected, the control is returned to the Media Player and the user is able to start streaming from the pause point, if present.

**Related GSM core specifications**

[tbd.]

**Reason for test**

To ensure that the streaming activity of Media Player doesn't preclude the ability of the user to reject an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call. This is a mandatory requirement.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached.

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Open the Media Player and start streaming a clip
2. Receive and reject a voice call while streaming is active
3. Resume the streaming activity

**Expected Behaviour**

In 2. The streaming is, preferably, automatically paused and it is possible to reject the incoming call.

In 3. It is possible to start the stream from the pause point, if present, generated in 2.

**47.2.4 Incoming voice call during a paused streaming: accept and close**

**Description**

The user is notified of an incoming call and given the option to either skip or accept the call. When the call is accepted and then closed, the control is returned to the Media Player and the user is able to start streaming from the pause point.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The purpose is to verify that a paused streaming session doesn't preclude the ability of the user to receive, accept and then close an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached.

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Open the Media Player and start streaming a clip
2. Pause the streaming session
3. Receive and accept a voice call while streaming is paused
4. Close the received voice call
5. Resume the streaming activity

**Expected Behaviour**

In 3 it is possible to accept the incoming call.

In 4 the voice call is closed and the control is returned to the Media Player
In 5 it is possible to start the stream from the pause point generated in 2.

### 47.2.5 Incoming voice call during a paused streaming: reject

**Description**
The user is notified of an incoming call and given the option to either skip or accept the call. When the call is rejected, the control is returned to the Media Player and the user is able to start streaming from the pause point.

**Related GSM core specifications**
[tbd.]

**Reason for test**
To ensure that a paused streaming session doesn't preclude the ability of the user to reject an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call.

**Initial configuration**
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

**Test procedure**
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip
2. Pause the streaming session
3. Receive and reject a voice call while streaming is paused
4. Resume the streaming activity

**Expected Behaviour**
In 3 it is possible to reject the incoming call
In 4 it is possible to start the stream from the pause point generated in 2.

### 47.2.6 Incoming voice call during buffering: accept and close

**Description**
The user is notified of an incoming call and given the option to either skip or accept the call. When the call is accepted and then closed, the control is returned to the Media Player and the user is able to start streaming from the point where buffering begun. At least, the user can restart streaming from the beginning.

**Related GSM core specifications**
[tbd.]

**Reason for test**
The purpose is to ensure that the buffering activity of Media Player doesn't preclude the ability of the user to receive, accept and then close an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call.

**Initial configuration**
UE should be in idle mode. The UE should be IMSI attached and Packet attached

**Test procedure**
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip (better with a high bit-rate)
2. While the Media Player is buffering data (before the play starts or in an intermediate phase of the stream), receive and accept a voice call
3. Close the received voice call
4. Resume the streaming activity

**Expected Behaviour**

2. It is possible to accept the incoming call
3. The voice call is closed and the control is returned to the Media Player
4. It is possible to start the stream from the point where the buffering begun

### 47.2.7 Incoming voice call during buffering: reject

**Description**

The user is notified of an incoming call and given the option to either skip or accept the call. When the call is rejected, the control is returned to the Media Player and the user is able to start streaming from the point where buffering begun. At least, the user can restart streaming from the beginning.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The purpose is to verify that the buffering activity of Media Player doesn't preclude the ability of the user reject an incoming voice call. The user should be notified of an incoming call and be given the option to either skip or accept the call.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Open the Media Player and start streaming a clip (better with a high bit-rate)
2. While the Media Player is buffering data (before the play starts or in an intermediate phase of the stream), receive and reject a voice call
3. Resume the streaming activity

**Expected Behaviour**

In 2 it is possible to reject the incoming call
In 3 it is possible to start the stream from the point where the buffering begun.

### 47.2.8 Incoming SMS

**Description**

The user has the ability to receive the SMS. This action does not interfere with the active streaming session. If user interaction is needed, control is subsequently returned to Media Player.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The purpose is to verify that the activation of Media Player doesn't preclude the ability of the user to receive a SMS. The user should be notified of an incoming SMS and be given the option to either skip or view the message.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Open the Media Player and start streaming a clip.
2. From other UE send a SMS to the UE under test.
3. Receive a SMS while streaming is active.

**Expected Behaviour**
In 3 a notification is presented to the user for each new message and streaming activity is not interrupted.

### 47.2.9 Incoming IM

**Description**
The user has the ability to receive the IM. This action does not interfere with the active streaming session. If user interaction is needed, control is subsequently returned to Media Player.

**Related GSM core specifications**
[tbd.]

**Reason for test**
The purpose is to ensure that the activation of Media Player doesn't preclude the ability of the user to receive an instant message (IM). The user should be notified of an incoming IM and be given the option to either skip or view the message.

**Initial configuration**
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

**Test procedure**
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip.
2. From other UE send an IM to the UE under test.
3. Receive a IMS while streaming is active.

**Expected Behaviour**
In 3 a notification is presented to the user for each new message and streaming activity is not interrupted.

### 47.2.10 Incoming FAX

**Description**
The user has the ability to receive the FAX. This action does not interfere with the active streaming session. If user interaction is needed, control is subsequently returned to Media Player.

**Related GSM core specifications**
[tbd.]

**Reason for test**
The reason is to ensure that the activation of Media Player doesn't preclude the ability of the user to receive a FAX. The user should be notified of an incoming FAX.

**Initial configuration**
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

**Test procedure**
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip.
2. Send a FAX to the UE under test.
3. Receive a FAX while streaming is active.
Expected Behaviour
In 3 the handset behaves properly without errors

47.2.11 Incoming Video Call

Description
The user has the ability to skip or accept the received video call. This action does not interfere with the active streaming session.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to ensure that the activation of Media Player doesn't preclude the ability of the user to receive a Video Call. The user should be notified of an incoming Video Call and be given the option to either skip or accept the call.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the Media Player and start streaming a clip.
2. Form other UE start a Video call to the UE under test.
3. Receive a Video Call while streaming is active

Expected Behaviour
The UE should be notified of an incoming Video Call and be given the option to either skip or accept the call.

47.2.12 Incoming MMS

Description
The user has the ability to receive the MMS. The notification and the download of the message do not interfere with the active streaming session. If user interaction is needed, control is subsequently returned to Media Player.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to ensure that the activation of Media Player doesn't preclude the ability of the user to receive a MMS. The user should be notified of an incoming MMS and be given the option to either accept or postpone the download of the message (depending on the actual MMS setting and on the handset capabilities).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. 1 PDP context: 0 for browser, 1 for streaming, then for MMs.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Set the MMS AutoDownload to ON
2. Open the Media Player and start streaming a clip
3. From other UE send a MMS to the UE under test.
4. Receive a MMS while streaming is active
Expected Behaviour
In 4 a notification is presented to the user for each new message and streaming activity is not interrupted.

47.2.13 Incoming Multimedia Message with single PDP context and active WAP Browser connection WAP browser and Streaming client use the same connection

Description
The user is informed that new MMs arrived but the streaming is not interrupted. When the streaming phase is complete the MMs can be manually (or automatically if AutoDownload is set to On) downloaded. At the end it should be possible to return to the Browser navigation.

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the handset is able stream a clip while receiving a MMS when Streaming and WAP browser use the same connection (the handset supports single PDP context).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. 1 PDP context: 1 for browser, then for streaming, then for MMS.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the WAP Browser and follow a link to an RTSP resource
2. While playing the clip, send a MMs to the handset. A notification pop-up should be presented to the user
3. Stop playing the clip
4. Download the MMs (if Auto-download is set to Off), using the previously received notification

Expected Behaviour
In 2. A notification is presented to the user for the new MMs
In 3. and 4. When the streaming is stopped the MMs can be downloaded. If Auto-download is set to On, the download should start as soon as the stream is interrupted.

47.2.14 Incoming Multimedia Message with multiple PDP contexts and active WAP Browser connection. WAP browser and Streaming client use different connections

Description
The user is informed that new MMs arrived but the streaming is not interrupted. When the streaming phase is complete the MMs can be manually (or automatically if AutoDownload is set to On) downloaded. If the handset supports more than 2 PDP contexts the MMs should be downloaded during the streaming phase. At the end it should be possible to return to the Browser navigation.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the handset is able stream a clip while receiving a MMS when Streaming and WAP browser use different connections (the handset supports multiple PDP contexts).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached
Test procedure
Where possible, this procedure should be repeated as follows:

1. Open the WAP Browser and follow a link to an RTSP resource
2. While playing the clip, send a MMs to the handset. A notification pop-up should be presented to the user
3. Stop playing the clip
4. Download the MMs (in Auto-download is set to Off), using the previously received notification

Expected Behaviour
In 2. A notification is presented to the user for the new MMs
In 3. and 4. When the streaming is stopped the MMs can be downloaded. If Auto-download is set to On, the download should start as soon as the stream is interrupted. If the handset supports more than 2 PDP contexts the MMs should be downloaded during the streaming phase.

47.3 Network Characteristics

47.3.1 Roaming

Description
The user can keep on playing the presentation without interruptions and quality degradation.

Related GSM core specifications
[tbd.]

Reason for test
The Media Player should support the ability to seamlessly roam from one PLMN to other PLMN (e.g. GPRS to 3G and from 3G to GPRS or EDGE to GPRS) without loss of service or unacceptable degradation of playback

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. It should be kept in mind the bandwidth limit of a GPRS connection to avoid testing high bit rate clips over GPRS connections.

Test procedure
Where possible, this procedure should be repeated as follows:

1. Open presentation with a low bit rate (lower than 30Kbps)
2. While playing, roam from GPRS to 3G
3. While playing, roam from 3G to GPRS

Expected Behaviour
In 2 and 3 The play is not interrupted and proceeds without unacceptable degradation

47.3.2 Buffering frequency

Description
The handset under test doesn't rebuffer more than the certified phone and it doesn't rebuffer in a deterministic way or at fixed time.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that streaming a long clip (e.g. 5 minute) at the maximum supported bandwidth, the handset under test doesn't rebuffer more than a certified phone.
Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a long clip on the handset under test and on a certified phone
2. Wait until the end of the clips
3. Repeat the test 5 times

Expected Behaviour
The clip is played without excessive rebuffering

47.4 Session Establishment and Control

47.4.1 RTSP minimum implementation support: SETUP, PLAY and TEARDOWN

Description
The Streaming client is able to manage the Session without errors or strange behaviours

Related GSM core specifications

Reason for test
The purpose is to test the behaviour of the client when it issues a SETUP request for a stream, then a PLAY and a TEARDOWN request. The SETUP request for a URI specifies the transport mechanism to be used for the streamed media. The PLAY method tells the server to start sending data via the mechanism specified in SETUP. The TEARDOWN request stops the stream delivery for the given URI, freeing the resources associated with it.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Open the streaming client.
2. Try to stream a clip
3. Stop the clip and exit the client
4. Verify that the resources on the server are released

Expected Behaviour
In 3. The client should normally play the clip
In 4. There should be no more resources allocated to the session identifier of the just closed streaming session and the context should be closed by the player. If a traceament is available, it is necessary to verify that the handset sends correctly the SETUP, PLAY and TEARDOWN PDUs.

47.4.2 RTSP port setting

Description
The Streaming client with default PORT value is able to connect to RTSP Server

Related GSM core specifications
[tbd.]
Reason for test
The purpose is to verify, if possible, that the handset is correctly configured to use the default RTSP port 554.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Check, if configurable from the user, that the default RTSP port value is 554
2. Open the streaming client.
3. Try to stream a clip
If the port value is not configurable and the handset streams contents without problems, then the embedded port value is 554, since the platform is waiting on that port

Expected Behaviour
1. The default value for RTSP port, when configurable, should be 554
2. The client should normally play the clip (connecting to the port 554 of the streaming server)

47.4.3 Fast Forward

Description
The Streaming client is able to manage without errors or strange behaviours the Fast Forward option

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify the FAST FORWARD option, implemented as PAUSE and subsequent PLAY with a timestamp bigger than the one where the session has been paused (using the Range header field).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start a streaming clip and then PAUSE it
2. PLAY the stream
3. STOP the stream
4. PLAY again the stream and then select the FAST FORWARD option
5. PAUSE the stream
6. PLAY again the stream
7. STOP the stream
8. PLAY again the stream
9. STOP the stream
10. STOP the stream

Expected Behaviour
2. The stream should start from the pause point
4. The stream should go fast forward
6. The stream should be played correctly after it has been fast forwarded and paused
9. The stream should be played correctly after it has been fast forwarded

47.4.4 Rewind

Description
The Streaming client is able to manage without errors or strange behaviours the Rewind option

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify the REWIND option, implemented as PAUSE and subsequent PLAY with a timestamp smaller than the one where the session has been paused (using the Range header field).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start a streaming clip and then PAUSE it
2. PLAY the stream
3. STOP the stream
4. PLAY again the stream and then select the REWIND option
5. PAUSE the stream
6. PLAY again the stream
7. STOP the stream
8. PLAY again the stream and then select the REWIND option
9. PLAY again the stream
10. STOP the stream

Expected Behaviour
2. The stream should start from the pause point
4. The stream should rewind
6. The stream should be played correctly after it has been rewinded and paused
9. The stream should be played correctly after it has been rewinded.

47.5 Audio contents and codecs

47.5.1 Support to AMR narrow-band (AMR-NB) speech decoder

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the Streaming client supports audio streams coded using "AMR narrow-band".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached
Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose audio stream has coded using "AMR narrow-band".
2. Play the clip until the end
3. Close the streaming client

Expected Behaviour
In 2. The clip is played correctly
In 3 the streaming client is closed without any error

47.5.2 Support to AMR wideband (AMR-WB) speech decoder

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports audio streams coded using "AMR wideband".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose audio stream has coded using "AMR wideband".
2. Play the clip until the end
3. Close the streaming client

Expected Behaviour
In 2. The clip is played correctly
In 3. The streaming client is closed without any error.

47.5.3 Support to MPEG-4 AAC LC (Low Complexity object type) audio decoder

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the Streaming client supports audio streams coded using "MPEG-4 AAC LC".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose audio stream has coded using "MPEG-4 AAC LC".
2. Play the clip until the content will finish
3. Close the streaming client

**Expected Behaviour**

In 2 the clip is played correctly.
In 3 the streaming client is closed without any error

### 47.5.4 Support to "Real Audio 8" audio codec

**Description**

The Media Player streams correctly all the content and it is closed without any problem.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The reason is to verify that the Streaming client supports audio streams coded using "Real Audio 8".

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Start streaming a content whose audio stream has coded using "Real Audio 8"
2. Play the clip until the content will finish
3. Close the streaming client

**Expected Behaviour**

In 2 the clip is played correctly.
In 3 the streaming client is closed without any error

### 47.5.5 Support to "Real Audio 9" audio codec

**Description**

The Media Player streams correctly all the content and it is closed without any problem.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The reason is to verify that the Streaming client supports audio streams coded using "Real Audio 9".

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Start streaming a content whose audio stream has coded using "Real Audio 9"
2. Play the clip until the content will finish
3. Close the streaming client

**Expected Behaviour**

In 2 the clip is played correctly.
In 3 the streaming client is closed without any error
47.5.6  Support to surestream using the Audio Codec "Real Audio 8"

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports the Real Format Audio codec 8 inclusive of bit stream switching functionality.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:

1. Start streaming a content whose audio stream has coded using "SureStream encoding with Real Audio 8"
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
In 2 the clip is played correctly.
In 3 the streaming client is closed without any error

47.5.7  Support to surestream using the Audio Codec "Real Audio 9"

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports the Real Format Audio codec 9 inclusive of bit stream switching functionality.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:

1. Start streaming a content whose audio stream has coded using "SureStream encoding with Real Audio 9"
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
In 2 the clip is played correctly.
In 3 the streaming client is closed without any error
47.6 Video contents and codecs

47.6.1 Support to Video Codec "H.263 Profile 0 Level 10"

Description
The Media Player streams correctly all the content and it is closed without any problem.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports video streams coded using "H.263 Profile 0 Level 10".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "H.263 Profile 0 Level 10"
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.2 Support to Video Codec "H.263 Profile 3 Level 10"

Description
The Media Player streams correctly all the content and it is closed without any problem.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports video streams coded using "H.263 Profile 3 Level 10".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "H.263 Profile 3 Level 10"
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.3 Support to Video Codec "MPEG-4 Simple Visual Profile Level 0"

Description
The Media Player streams correctly all the content and it is closed without any problem.
Related GSM core specifications

_reason_for_test_

Reason for test
The purpose is to verify that the Streaming client supports video streams coded using "MPEG-4 Simple Visual Profile Level 0".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "MPEG-4 Simple Visual Profile Level 0"
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.4 Support to Video Codec "Real Video 8"

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications

_reason_for_test_

Reason for test
The purpose is to verify that the Streaming client supports video streams coded using "Real Video 8".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "Real Video 8"
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.5 Support to Video Codec "Real Video 9"

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications

_reason_for_test_

Reason for test
The purpose is to verify that the Streaming client supports video streams coded using "Real Video 9".

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached
Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "Real Video 9"
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.6 Support to surestream using the Video Codec "Real Video 8"

Description
The Media Player streams correctly all the content and it is closed without any problem.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports the Real Format Video codec 8 inclusive of bit stream switching functionality.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "SureStream encoding with Real Video 8"
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.6.7 Support to surestream using the Video Codec "Real Video 9"

Description
The Media Player streams correctly all the content and it is closed without any problem.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Streaming client supports the Real Format Video codec 9 inclusive of bit stream switching functionality.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has coded using "SureStream encoding with Real Video 9"
2. Play the clip until the content will finish
3. Close the streaming client.
Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.7 Video and Audio Codecs

47.7.1 H.263 Profile 0 Level 10 (video) and MPEG-4 AAC (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player supports the streaming of contents encoded with H.263 Profile 0 (Baseline) Level 10 video codec and MPEG-4 AAC audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using H.263 Profile 0 Level 10 and whose audio stream has been coded using MPEG-4 AAC.
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error

47.7.2 H.263 Profile 0 Level 10 (video) and AMR-NB (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player supports the streaming of contents encoded with H.263 Profile 0 (Baseline) Level 10 video codec and AMR-NB audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using H.263 Profile 0 Level 10 and whose audio stream has been coded using AMR-NB
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error
47.7.3  H.263 Profile 3 Level 10 (video) and MPEG-4 AAC (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications

[tbd.]

Reason for test
The reason is to verify that the Media Player supports the streaming of contents encoded with H.263 Profile 3 (Interactive and streaming wireless profile) Level 10 video codec and MPEG-4 AAC audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using H.263 Profile 3 Level 10 and whose audio stream has been coded using MPEG-4 AAC.
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.7.4  H.263 Profile 3 Level 10 (video) and AMR-NB (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications

Reason for test
The reason is to verify that the Media Player supports the streaming of contents encoded with H.263 Profile 3 (Interactive and streaming wireless profile) Level 10 video codec and AMR-NB audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using H.263 Profile 3 Level 10 and whose audio stream has been coded using AMR-NB.
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.7.5  MPEG-4 Simple Visual Profile Level 0 (video) and MPEG-4 AAC (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem
Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player supports the streaming of contents encoded with MPEG-4 Simple Visual Profile Level 0 video codec and MPEG-4 AAC audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using MPEG-4 Simple Visual Profile Level 0 and whose audio stream has been coded using MPEG-4 AAC
2. Play the clip until the content will finish
3. Close the streaming client.

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.7.6 MPEG-4 Simple Visual Profile Level 0 (video) and AMR-NB (audio)

Description
The Media Player streams correctly all the content and it is closed without any problem

Related GSM core specifications
[tbd.]

Reason for test
The ensure is to verify that the Media Player supports the streaming of contents encoded with MPEG-4 Simple Visual Profile Level 0 video codec and AMR-NB audio codec.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content whose video stream has been coded using MPEG-4 Simple Visual Profile Level 0 and whose audio stream has been coded using AMR-NB
2. Play the clip until the content will finish
3. Close the streaming client

Expected Behaviour
The clip is played correctly and the streaming client is closed without any error.

47.8 Session Description Protocol (SDP) files

47.8.1 SDP files and SDP syntax

Description
The Media Player interprets the SDP syntax according to the SDP specification

Related GSM core specifications
RFC 2326, Appendix C
Reason for test
The reason is to verify that the Media Player supports Session Description Protocol for describing the properties of media streams that can be accessed from a Media Server, including their IP addresses, ports, and media types etc.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Use a http link to open a SDP presentation file
2. Play the clip

Expected Behaviour
The clip is played correctly with interpretation of SDP file.

47.8.2 SDP file: pre-decoder attributes

Description
The clip is played correctly without abnormal behaviours

Related GSM core specifications
3GPP 26.234 (5.3.3.2 Additional SDP fields)

Reason for test
The reason is to verify that the Media Player supports pre-decoder attributes within the SDP file.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Use a http link to a SDP file containing appropriate pre-decoder attributes (e.g. a=X-predecbufsize, a=X-initpredecbufperiod, a=X-initpostdecbufperiod and a=X-decbyterate)
2. Play the clip

Expected Behaviour
The clip is played correctly.

NOTE: it could be difficult to verify that the handset uses correctly the values of the above attributes.

47.9 Connections

47.9.1 Connection not configured

Description
The Media Player presents proper information to the user without abnormal behaviour

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify the Media Player behaviour when the user tries to stream a clip while the streaming configuration is still not configured (or not correctly configured).
Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Verify that the streaming configuration is not set
2. Try to stream a clip

Expected Behaviour
The clip is not streamed and a proper message is shown to the user

47.9.2 Different Connections

Description
When switching between WAP and Streaming connection, the handset behaves correctly and the user is presented with the option to confirm the new session connection.

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the handset is able to manage correctly different connection (e.g. for Streaming and WAP browsing) when available. The user must be presented with the option to confirm each new session connection.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Verify that, if available, the different connections are correctly set
2. Open a WAP connection
3. Confirm the opening of a streaming connection
4. Play the clip
5. Close the streaming client and return to the browser

Expected Behaviour
2. It is possible to browse with the WAP connection
3. The user is asked to open the appropriate connection and then it is possible to stream
4. The content is correctly streamed
5. The Browser behaves correctly using its appropriate connection

47.9.3 Connection confirmation

Description
The user is presented with the option to confirm the session connection

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that, when no appropriate connection is present, the user must be presented with the option to confirm the session connection.
Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming from a bookmark, without an active connection
2. Play the content

Expected Behaviour
Before the clip is played, the user has to confirm the connection

47.10 Playback

47.10.1 Decode rates

Description
The Media Player streams correctly all the content without rebuffering

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the maximum bandwidth supported by the Media Player is at least 128 kbps. Furthermore, the handset must behave correctly when streaming contents encoded with bit rates different from 128 kbps.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. It is possible to execute this test case only on 3G devices (in particular for contents encoded with a bit rate higher than 30kbps)

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a content encoded with a bit rate of 128kbps
2. Play the clip until the content will finish
3. Start streaming a content encoded with a bit rate different from 128kbps (e.g. 64kbps)
4. Repeat the point 3. with different bit rates

Expected Behaviour
In 2., 3., 4 The clip is played correctly

47.10.2 Simultaneous playback

Description
The Media Player streams correctly all the content without rebuffering

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the maximum bandwidth supported by the Media Player is at least 128 kbps. Furthermore, the handset must behave correctly when streaming contents encoded with bit rates different from 128 kbps.
Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. It is possible to execute this test case only on 3G devices (in particular for contents encoded with a bit rate higher than 30kbps)

Test procedure
Where possible, this procedure should be repeated as follows:
Start streaming a clip, containing audio and video contents

Expected Behaviour
The clip is played correctly

47.10.3 Audio playback of unsupported encoding format

Description
The clip is not played and the handset is able to manage correctly the unsupported encoding format giving the user proper information

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that Media Player supports playback of audio only in the formats specified by the product and has a consistent behaviour in case of unsupported encoding formats.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
Start streaming a clip containing audio encoded with an unsupported format (but supported MIME type)

Expected Behaviour
The clip is not played

47.10.4 Video playback of unsupported encoding format

Description
The clip is not played and the handset is able to manage correctly the unsupported encoding format giving the user proper information

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that Media Player supports playback of video only in formats specified by the product and has a consistent behaviour in case of unsupported encoding formats.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
Start streaming a clip containing video encoded with an unsupported format (but supported MIME type)
Expected Behaviour
The clip is not played

47.10.5 Playback of unsupported MIME type

Description
The clip is not played and the handset is able to manage correctly the unsupported MIME type giving the user proper information

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player has a consistent behaviour in case of unsupported MIME type.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. This test could be done according to the platform ability to produce unsupported MIME types.

Test procedure
Try streaming a clip containing media encoded and associated with an unsupported MIME type.

Expected Behaviour
The clip is not played

47.10.6 Control functionality (Play, Stop, Pause)

Description
The clip is correctly played and can be stopped and paused within the Media Player.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player provides basic control functionality (Play, Stop, Pause)

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. Stop the clip
3. Start again streaming a clip
4. Pause the clip and then resume the play

Expected Behaviour
In 2 the clip is stopped.
In 3 after the stop, the new play request starts the stream from the beginning.
In 4 the clip is paused and it is possible to start again from the pause point.
47.10.7 Control functionality (Volume)

Description
The use has the ability to change volume level while playing a clip. The play must continue without interruption.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player provides basic control functionality for Volume setting. This functionality is mandatory.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. During the play, change the volume setting

Expected Behaviour
The volume level changes in accordance to what has been chosen by the user.

47.10.8 Control functionality (Mute/Unmute)

Description
The user has the ability to Mute and Unmute the speakers while playing a clip. The play must continue without interruption.

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the Media Player provides basic control functionality for Mute setting.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. During the play, choose the Mute option
3. Keep on playing and choose Unmute option

Expected Behaviour
In 2 The volume level is lowered to the minimum (Mute condition).
In 3 The volume level is returned to normal level.

47.10.9 Playback time indication

Description
The user has the capability to view the total duration and elapsed time of the clip. It is optional whether these counters are permanently exposed or revealed through a menu option.

Related GSM core specifications
[tbd.]
Reason for test
The purpose is to verify that the Media Player provides time counters displaying the total duration and elapsed time of the media clip being played (it is optional whether these counters are permanently exposed or revealed through a menu option).

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. During the play, view the elapsed time of the clip

Expected Behaviour
It is possible to show the total duration and elapsed time of the clip

47.10.10 Metadata

Description
The user has the capability to view the metadata associated with the clip currently being played. As a minimum, the following information should be displayed (if provided): Author, Title, Duration, Date of Publishing, Size and Copyright information.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player provides the user with the ability to view the metadata associated with the clip currently being played.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. During the play, view the information associated with the clip.

Expected Behaviour
It is possible to view the information associated with the clip

47.10.11 Mono/stereo

Description
The user has the ability to switch between the Mono and Stereo channel configuration and the clip is correctly played with both the channel configurations.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player supports Mono and Stereo channel configurations.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached
Test procedure
Where possible, this procedure should be repeated as follows:

1. Open the MediaPlayer
2. Set the channel configuration to Mono
3. Start streaming a clip with audio content
4. Set the channel configuration to Stereo.
5. Start streaming a clip with audio content

Expected Behaviour
In 2 and 4 it is possible to switch between Mono and Audio channel configuration
In 3. The video is correctly played with Mono audio.
In 5. The video is correctly played with Stereo audio

47.10.12 Display sizes

Description
The video is correctly played and rescaled maintaining the correct horizontal/vertical ratio

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that the Media Player allows the user to scale the rendered video to fit video display sizes from SQCIF (128Hx96V) through to VGA (640Hx480V) or full screen, dependent on the host platform.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
Start streaming a clip

Expected Behaviour
The video is correctly played and rescaled

47.10.13 Fullscreen Mode

Description
The video is correctly played and rescaled to Fullscreen, maintaining the correct horizontal/vertical ratio

Related GSM core specifications
[tbd.]

Reason for test
The purpose is to verify that the Media Player supports Fullscreen rendering during playback.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached

Test procedure
Where possible, this procedure should be repeated as follows:
1. Start streaming a clip
2. Set the Fullscreen mode, if available

**Expected Behaviour**

The video is correctly played and rescaled

### 47.10.14 Operator override

**Description**

The video is correctly played and it is not possible to use the disabled control

**Related GSM core specifications**

[tbd.]

**Reason for test**

The reason is to verify that it is possible for the Operator to override Media Player controls e.g. Fast forward, rewind where present.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached. This test could be done according to platform capabilities.

**Test procedure**

Start streaming a clip, knowing that, for that clip, the operator will disable a particular control (e.g. Fast Forward)

**Expected Behaviour**

The video is correctly played

### 47.11 Progressive Download

#### 47.11.1 Support to Progressive Download of 3gp files

**Description**

The clip is played correctly using progressive download: it is necessary that the clip starts playing before the download is finished.

**Related GSM core specifications**

[tbd.]

**Reason for test**

The purpose is to verify that it is possible to display 3gp files using progressive download.

**Initial configuration**

UE should be in idle mode. The UE should be IMSI attached and Packet attached. The file must be coded to allow progressive download.

**Test procedure**

Where possible, this procedure should be repeated as follows:

1. Choose a link referencing a 3gp file coded to be progressive downloaded
2. Play the clip until the content will finish

**Expected Behaviour**

The clip is played correctly.
47.11.2 Support to Progressive Download of MP4 files

Description
The clip is played correctly using progressive download: it is necessary that the clip starts playing before the download is finished.

Related GSM core specifications
[tbd.]

Reason for test
The reason is to verify that it is possible to display MP4 files using progressive download.

Initial configuration
UE should be in idle mode. The UE should be IMSI attached and Packet attached. The file must be coded to allow progressive download.

Test procedure
Where possible, this procedure should be repeated as follows:
1. Choose a link addressing a MP4 file coded to be progressive downloaded
2. Play the clip until the content will finish

Expected Behaviour
2. Play the clip until the content will finish

48 Camera Interworking
Testing Camera is not in the scope of these guidelines, except for tests relating to the undisturbed function of the UE’s primary functionality as a communicating mobile device.

48.1 Service maintained during photo/video capture

Description
Ensure undisturbed service of the UE when camera is in use for capturing pictures or video.

Related GSM core specifications
None.

Reason for test
The UE must be able to function undisturbed as a communicating mobile device when the camera(s) is in use for capturing pictures and/or Video.
This includes the use of the full functionality of the camera, like autofocus, flash, picture facilities at the recording moment.

Test procedure
For camera taking pictures:
1. Start the camera; choose a complex picture setting, like flash, colour correction etc.
2. When ready to capture a picture. Initiate a call to the UE.
3. Immediately after the call is initiated, capture a picture.

For camera taking movies:
1. Start the camera; choose a complex picture and sound setting, like flash, colour correction stereosound etc.
2. When ready to capture a movie. Initiate a call to the UE.
3. Immediately after the call is initiated, start the movie recording.
Expected behaviour
The UE must respond to the call in time, without losing the call or start malfunctioning.

48.2 Service maintained when using picture or movie program functions inbuilt or supplied with the UE

Description
Ensure undisturbed service of the UE - when UE is used for viewing or manipulating pictures or video.

Related GSM core specifications
None.

Reason for test
The UE must be able to function undisturbed as a communicating mobile device when the UE is used for viewing or manipulating pictures or video. This includes the use of programs supplied with the UE, for installation in the UE.

Test procedure
For camera manipulating pictures:
1. Start the camera; choose a complex picture function, like resizing, colour correction etc.
2. When ready to activate the chosen function. Initiate a call to the UE.
3. Immediately after the call is initiated, activate the function.

For camera manipulating movies:
1. Start the camera; choose a complex movie function, like cutting, colour correction etc.
2. When ready to activate the chosen function. Initiate a call to the UE.
3. Immediately after the call is initiated, activate the function.

Expected behaviour
The UE must respond to the call in time, without losing the call or start malfunctioning.

48.3 Service maintained during transfer of pictures or movie out (or in) the UE.

Description
Ensure undisturbed service of the UE when transferring pictures or movie out (or in) the UE. The transfer can be to a TV, PC, Picture printer, storage device etc.

Related GSM core specifications
None.

Reason for test
The UE must be able to function undisturbed as a communicating mobile device when transfer of pictures or Video to or from the UE is taking place (this test is not including any transport via a call to or from the UE).

The most complex form of transport is selected. E.g. USB or Bluetooth

Test procedure
1. Prepare the UE for transferring a movie approximately of minimum 1 minute or pictures (equivalent to the size of the 1 minute movie).
2. When ready to take the transfer. Initiate a call to the UE.
3. Immediately after the call is initiated, start the transfer.
Expected behaviour
The UE must respond to the call in time, without losing the call or start malfunctioning.

49 E-Mail Sending/Receiving

NOTE: The tests of this part should be applicable on e-mail feature supported terminal.

49.1 E-Mail Mobile originated

49.1.1 Mobile originated with different address format

49.1.1.1 Send E-Mail with email recipient using the “To”, the “Cc” or the “Bcc” field

Description
Verification that the MS correctly sends the message when the “To”, the “Cc” or the “Bcc” address field is used to insert the email address format.

Reason for test
To ensure that the MS correctly sends the message when the “To”, the “Cc” or the “Bcc” address field is used to insert the email address format.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
1. Create a new E-Mail message with a text, then add an email recipient to the “To” address field. Then send the e-mail. The MS displays a message that the e-mail has been sent. Verify that the email recipient receives the message and that the address fields and the email body are correctly used.
2. Repeat the test using the “Cc” address field.
3. Repeat the test using the “Bcc” address field.

Expected behaviour
The message is correctly sent and received by the email recipient indicating the appropriate address fields.

49.1.1.2 Send E-Mail with multiple recipients

Description
Verification that it is possible to send an e-mail message to more than one recipient.

Reason for test
To ensure that it is possible to send an e-mail message to more than one recipient.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.
Test procedure
Create a new e-mail message with a text, add 20 different recipients, using the e-mail format recipients. Use all three address fields (To, Cc, and Bcc). Send the e-mail message. The MS displays a message that the e-mail has been sent. Verify that the e-mail recipients receive the message and that the email is correctly received.

Expected behaviour
The message is correctly sent and received by all recipients indicating the appropriate address fields.

49.1.1.3 Send E-Mail to an address book recipient

Description
Verification that the e-mail will be sent to an address book recipient.

Reason for test
To ensure that the e-mail will be sent to an address book recipient.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, and address book recipient available.

Test procedure
Create a new e-mail message with a text, add recipients that already exist in the phone address book (as e-mail recipients). Use all three address fields (To, Cc, and Bcc). Send the e-mail. For the valid existing address book recipients the MS displays a message that the e-mail has been sent.

Expected behaviour
The message is sent for all addressee recipients with the appropriate display messages and received by all valid address book recipients indicating the appropriate address fields.

49.1.2 Mobile originated with different fields and objects

49.1.2.1 Send E-Mail with subject (maximum length)

Description
Verification that the maximum length of the subject field is correctly supported.

Reason for test
To ensure that the maximum length of the subject field is correctly supported.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
Create a new E-Mail and insert a text object. Fill the subject field with the maximum length of 40 characters. Send the message. The MS displays a message that the e-mail has been sent. Verify that all characters of the subject are sent to the recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the complete subject field.
49.1.2.2 Send E-Mail with text (maximum length)

Description
Verification that the maximum length of the text field is correctly supported.

Reason for test
To ensure that the maximum length of the text field is correctly supported.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
Create a new e-mail and insert a text object. Fill the text object with the maximum length as defined by the vendor of terminal. Send the message. The MS displays a message that the e-mail has been sent. Verify that all characters of the text are sent to the recipient.

Expected behaviour
The message is correctly sent and received by the recipient with the complete text field.

49.1.2.3 Send E-Mail with different objects (iMelody / MIDI / AMR sound / GIF / Animated GIF / JPEG / WBMP - max. size)

Description
Verification that the object “iMelody / MIDI / AMR sound / GIF / Animated GIF / JPEG / WBMP” with max. size is correctly supported.

Reason for test
To ensure that the object “iMelody / MIDI / AMR sound / GIF / Animated GIF / JPEG / WBMP” with max. size is correctly supported.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, iMelody available in the sound browser of the MS.

Test procedure
Create a new e-mail and insert an iMelody sound object. Send the message. The MS displays a message that the e-mail has been sent. Verify that the iMelody is played at the recipient while the e-mail is viewed and that the sound between the two MSs is comparable.

Repeat this test process for the other objects: MIDI / AMR sound / GIF / Animated GIF / JPEG / WBMP

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate object.

49.1.2.4 Send E-Mail with different objects

Description
Verification that it is possible to send an e-mail with different objects.

Reason for test
To ensure that it is possible to send an e-mail with different objects.

Related GSM core specifications
RFC2821, RFC 1939
Initial configuration
MS in idle mode, at least 2 different pictures and 2 different sound objects available in the MS.

Test procedure
Create a new e-mail and insert at least 2 different text, 2 different picture and 2 different sound objects. Send the message. The MS displays a message that the e-mail has been sent. Verify that all objects are correctly available at the recipient while the e-mail is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with all objects.

49.1.2.5 Send E-Mail with Business Card attached
Description
Verification that it is possible to send an E-Mail with an attached Business Card.

Reason for test
To ensure that it is possible to send an E-Mail with an attached Business Card.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, Business Card available in the organiser of the MS.

Test procedure
Create a new e-mail and attach a Business Card or add a contact from the phonebook as attachment. Send the message. The MS displays a message that the e-mail has been sent. Verify that the Business Card can be displayed at the recipient while the e-mail is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the Business Card.

49.1.2.6 Send message with appointment attached
Description
Verification that it is possible to send an e-mail with an attached appointment from the organizer.

Reason for test
To ensure that it is possible to send an e-mail with an attached appointment from the organizer.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, appointment available in the organiser of the MS.

Test procedure
Create a new e-mail and attach an appointment from the organizer. Send the message. The MS displays a message that the e-mail has been sent. Verify that the appointment can be displayed at the recipient while the e-mail is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the attached appointment.

49.1.2.7 Send e-mail with VNotes attached
Description
Verification that it is possible to send an e-mail with an attached VNote from the organizer.
Reason for test
To ensure that it is possible to send an e-mail with an attached VNote from the organizer.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, VNote available in the organiser of the MS.

Test procedure
Create a new e-mail and attach a VNote from the organizer. Send the message. The MS displays a message that the e-mail has been sent. Verify that the VNote can be displayed at the recipient while the e-mail is viewed.

Expected behaviour
The message is correctly sent and received by the recipient with the attached VNote.

49.1.2.8 Send E-Mail with too long mail address recipient (exceed 255 characters)

Description
Verification that an e-mail with too long e-mail address recipient (exceeding 255 characters) could not be sent.

Reason for test
Verification that an e-mail with too long e-mail address recipient (exceeding 255 characters) could not be sent.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, too long e-mail address recipient (exceeding 255 characters) available.

Test procedure
Create a new e-mail and enter the too long e-mail address recipient (exceeding 255 characters). Send the message. The MS displays a message that the e-mail recipient has a too long address field and verify that the mail could not be sent.

Expected behaviour
The message could not be sent since the recipient's mail address is too long.

49.1.3 Send E-Mail with Priorities

49.1.3.1 Send E-Mail with NORMAL / LOW / LOWEST / HIGH / HIGHEST / priority

Description
Verification that the e-mail priority is correctly supported by the MS.

Reason for test
To ensure that the e-mail priority is correctly supported by the MS.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.
Test procedure
Create a new e-mail and set the priority to “normal”. Send the message. The MS displays a message that the e-mail has been sent. Verify that the message received by the recipient has “normal” priority.

Repeat this test procedure with “Low / Lowest / High / Highest” priorities.

Expected behaviour
The message is correctly sent and received by the recipient with the appropriate priority.

49.1.4 Reply and Forward E-Mail Messages

49.1.4.1 Reply to message with single recipient

Description
Verification that the MS correctly supports the reply to an e-mail with a single recipient.

Reason for test
To ensure that the MS correctly supports the reply to an e-mail with a single recipient.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, received e-mail with various email recipients in the “To”-, “Cc”- and “Bcc”-address field in the e-mail message store.

Test procedure
1. Create a new e-mail by replying to one recipient having an e-mail address. Send the message to an email client. The MS displays a message that the e-mail has been sent. Verify that the e-mail is received by the correct recipient.
2. Repeat the test replying to one recipient in the “Cc” address field.
3. Repeat the test replying to one recipient in the “Bcc” address field.

Expected behaviour
The message is correctly sent and received by the appropriate recipient.

49.1.4.2 Reply to message with multiple recipients

Description
Verification that the MS correctly supports the reply to an e-mail with multiple recipients.

Reason for test
To ensure that the MS correctly supports the reply to an e-mail with multiple recipients.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, received e-mail with various email recipients in the “To”-, “Cc”- and “Bcc”-address field in the MMS message store.

Test procedure
Create a new e-mail by replying to all recipients. Send the e-mail message. The MS displays a message that the e-mail has been sent. Verify that the e-mail message is received by the previous sender and all recipients in the “To”-, “Cc”- and “Bcc”-address field.

Expected behaviour
The message is correctly sent and received by all recipients.
49.1.4.3 Forward a received message with and without attachment

Description
Verification that the MS correctly supports the forwarding of a received e-mail with and without attachment.

Reason for test
Verification that the MS correctly supports the forwarding of a received e-mail with and without attachment.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, received e-mail available in the message store of the MS.

Test procedure
1. Receive a new e-mail. Display the message and select the “forwarding” function. Enter a new recipient and send the message. Verify that the message will be received by the recipient and that the e-mail is marked as being forwarded.
2. Repeat the test forwarding the message to multiple recipients and adding an attachment.

Expected behaviour
The message is correctly forwarded and received by the recipient(s) with the “forwarding marker” and the inserted attachment.

49.2 E-Mail Mobile terminated

49.2.1 Mobile terminated with different address format

49.2.1.1 Receive E-Mail from MSISDN / E-Mail Client sender using the “To”, the “Cc” or the “Bcc” field

Description
Verification that the MS correctly supports the receiving of an e-mail from a sender using the “To”, “Cc” or “Bcc” address field.

Reason for test
To ensure that the MS correctly supports the receiving of an e-mail from a sender using the “To”, “Cc” or “Bcc” address field.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
1. Receive an e-mail from a MS / E-Mail Client where the “To” address field was used as e-mail address format. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the sender and the message content is correctly displayed.
2. Repeat the test receiving an e-mail from a MS / E-Mail Client where the “Cc” address field was used as e-mail address format.
3. Repeat the test receiving an e-mail from a MS / E-Mail Client where the “Bcc” address field was used as e-mail address format.

Expected behaviour
The sender and the message content is correctly displayed.
49.2.2 Mobile terminated with different fields and objects

49.2.2.1 Receive E-Mail with subject (maximum length)

**Description**
Verification that the MS correctly supports the receiving of an e-mail containing a subject with maximum length.

**Reason for test**
To ensure that the MS correctly supports the receiving of an e-mail containing a subject with maximum length.

**Related GSM core specifications**
RFC2821, RFC 1939

**Initial configuration**
MS in idle mode.

**Test procedure**
Receive an e-mail containing a subject field with maximum length of 40 characters. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the subject field is complete and correctly displayed.

**Expected behaviour**
The subject field is complete and correctly displayed.

49.2.2.2 Receive E-Mail with text (maximum length)

**Description**
Verification that the MS correctly supports the receiving of an e-mail containing a text with maximum length.

**Reason for test**
To ensure that the MS correctly supports the receiving of an e-mail containing a text with maximum length.

**Related GSM core specifications**
RFC2821, RFC 1939

**Initial configuration**
MS in idle mode.

**Test procedure**
Receive an e-mail containing a text field with maximum length as defined by the vendor of terminal. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the text field is complete and correctly displayed.

**Expected behaviour**
The text field is complete and correctly displayed.

49.2.2.3 Receive E-Mail with different objects (iMelody / MIDI / AMR sound / GIF image / Animated GIF / JPEG / WBMP) – play and save these objects

**Description**
Verification that the MS correctly supports the receiving, playing and saving of an e-mail containing an iMelody / MIDI / AMR sound / GIF image / Animated GIF / JPEG / WBMP object.
\textbf{Reason for test}
Verification that the MS correctly supports the receiving, playing and saving of an e-mail containing an iMelody / MIDI / AMR sound / GIF image / Animated GIF / JPEG / WBMP object.

\textbf{Related GSM core specifications}
RFC2821, RFC 1939

\textbf{Initial configuration}
MS in idle mode.

\textbf{Test procedure}
Receive an e-mail containing an iMelody sound object. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the iMelody sound object is correctly played (i.e. that it is comparable to the sent iMelody) while viewing the e-mail. Save the iMelody sound object to the designated data folder of the MS.
Repeat this test process with MIDI / AMR sound / GIF image / Animated GIF / JPEG / WBMP objects.

\textbf{Expected behaviour}
The iMelody / MIDI / AMR sound / GIF image / Animated GIF / JPEG / WBMP objects sound object is correctly played and can be saved to the appropriate data folder of the MS.

\textbf{49.2.2.4 Receive E-Mail with different objects}

\textbf{Description}
Verification that the MS correctly supports the receiving of an e-mail containing different objects.

\textbf{Reason for test}
To ensure that the MS correctly supports the receiving of an e-mail containing different objects.

\textbf{Related GSM core specifications}
RFC2821, RFC 1939

\textbf{Initial configuration}
MS in idle mode.

\textbf{Test procedure}
Receive an e-mail containing at least 2 different text, 2 different picture and 2 different sound objects. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that all objects are correctly available and can be played/displayed while viewing the e-mail. Save the objects to their designated data folders of the MS.

\textbf{Expected behaviour}
All objects can be played/displayed and can be saved to the appropriate data folders of the MS.

\textbf{49.2.2.5 Receive E-Mail with Business Card attached}

\textbf{Description}
Verification that the MS correctly supports the receiving of an e-mail containing a Business Card.

\textbf{Reason for test}
To ensure that the MS correctly supports the receiving of an e-mail containing a Business Card.

\textbf{Related GSM core specifications}
RFC2821, RFC 1939

\textbf{Initial configuration}
MS in idle mode.
Test procedure
Receive an e-mail with a Business Card attached. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the Business Card is displayed when viewing the e-mail. Save the Business Card to the directory of the MS.

Expected behaviour
The Business Card can be displayed and saved to the directory of the MS.

49.2.2.6 Receive E-Mail with an appointment attached
Description
Verification that the MS correctly supports the receiving of an e-mail containing an appointment.
Reason for test
To ensure that the MS correctly supports the receiving of an e-mail containing an appointment.
Related GSM core specifications
RFC2821, RFC 1939
Initial configuration
MS in idle mode.
Test procedure
Receive an e-mail containing an appointment. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the appointment is displayed when viewing the e-mail. Save the appointment to the organizer of the MS.
Expected behaviour
The appointment can be displayed and saved to the organizer of the MS.

49.2.2.7 Receive E-Mail with VNotes attached
Description
Verification that the MS correctly supports the receiving of an e-mail containing a VNote.
Reason for test
To ensure that the MS correctly supports the receiving of an e-mail containing a VNote.
Related GSM core specifications
RFC2821, RFC 1939
Initial configuration
MS in idle mode.
Test procedure
Receive an e-mail containing a VNote. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the VNote is displayed when viewing the e-mail. Save the VNote to the organizer of the MS.
Expected behaviour
The VNote can be displayed and saved to the organizer of the MS.

49.2.2.8 Receive E-Mail with too large attachment
Description
Verification that the MS correctly supports the receiving of an e-mail containing a too large attachment but do not start to download this attachment.
Reason for test
To ensure that the MS correctly supports the receiving of an e-mail containing a too large attachment but do not start to download this attachment.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
Receive an e-mail containing a too large attachment. The MS shall indicate the receipt of a new e-mail and while starting to open the attachment a notification message should appear on the screen that the attachment is too large. Therefore the MS should not to start to download the attachment.

Expected behaviour
The MS should not to start to download the attachment since it is too large.

49.2.3 Receive E-Mail with Priorities

49.2.3.1 Receive E-Mail with Normal / Low / Lowest / High / Highest Priority

Description
Verification that the MS correctly supports the receiving of an e-mail with Normal / Low / Lowest / High / Highest priority.

Reason for test
To ensure that the MS correctly supports the receiving of an e-mail with Normal / Low / Lowest / High / Highest priority.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode.

Test procedure
Receive an e-mail with the priority set to “normal”. The MS shall indicate the receipt of a new e-mail. Open the received message. Verify that the e-mail is indicating the priority set to “normal”.

Repeat this test process with the other priorities like / Low / Lowest / High / Highest

Expected behaviour
The received e-mail is indicating the priority set to the appropriate one.

49.2.3.2 Receive E-Mail with the MS profile “Meeting or silence”

Description
Verification that when the profile “Meeting” or “Silence” is activated in the MS, it shall not automatically play a sound object of a MMS and that the MS shall be mute.

Reason for test
To ensure that when the profile “Meeting” or “Silence” is activated in the MS, it shall not automatically play a sound object of an e-mail and that the MS shall be mute.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, profile set to “Meeting” or “Silence”.
Test procedure
Receive an e-mail containing a sound object. The MS shall indicate the receipt of a new e-mail in silent/meeting mode. Open the received message. Verify that the MS is not automatically playing the sound object of the e-mail and that the MS is mute.

Expected behaviour
The MS is not automatically playing the sound object of the e-mail.

49.3 E-Mail Reports

49.3.1 E-Mails with Delivery Report

49.3.1.1 Send E-Mail with Delivery Report set to “On“

Description
Verification that the MS correctly supports indicating the Delivery Report request to the network.

Reason for test
To ensure that the MS correctly supports indicating the Delivery Report request to the network.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, Delivery report is set to “On” in the MS.

Test procedure
Create a new e-mail. Send the message using an e-mail client as recipient. The MS displays a message that the e-mail has been sent. Ensure that the recipient has successfully received the e-mail. Verify that the Delivery Report is sent back to the sender of the e-mail. Verify that the MS correctly displays the Delivery Report.

Expected behaviour
The MS is correctly displaying the Delivery Report.

49.3.1.2 Send E-Mail with Delivery Report set to “Off“

Description
Verification that the MS correctly supports indicating the Delivery Report request to the network.

Reason for test
To ensure that the MS correctly supports indicating the Delivery Report request to the network.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, Delivery report is set to “Off” in the MS.

Test procedure
Create a new e-mail. Send the message. The MS displays a message that the e-mail has been sent. Ensure that the recipient has successfully received the e-mail. Verify that no Delivery Report is sent back to the sender of the e-mail.

Expected behaviour
The MS is not receiving a Delivery Report.
### 49.3.1.3 Receive a Delivery Report when the E-Mail was retrieved / Successful

**Description**
Verification that the MS correctly supports the receipt of the e-mail Delivery Report.

**Reason for test**
To ensure that the MS correctly supports the receipt of the e-mail Delivery Report.

**Related GSM core specifications**
RFC2821, RFC 1939

**Initial configuration**
MS in idle mode, Delivery report is set to “On” in the MS.

**Test procedure**
Create a new e-mail. Send the message. The MS displays a message that the e-mail has been sent. Ensure that the recipient has successfully received the e-mail. Verify that the Delivery Report is received by the sender of the e-mail. Verify that the MS correctly indicates the status of the sent message as “delivered”.

**Expected behaviour**
The MS is displaying the delivery status of the sent message as “delivered”.

### 49.4 E-Mail Error Handling and Multitask Interactions

#### 49.4.1 Error handling for sending and receiving E-Mail

##### 49.4.1.1 Abort the transmission when sending a message

**Description**
Verification that it is possible to cancel the upload session for e-mail without losing the e-mail to be sent.

**Reason for test**
To ensure that it is possible to cancel the upload session for e-mail without losing the e-mail to be sent.

**Related GSM core specifications**
RFC2821, RFC 1939

**Initial configuration**
MS in idle mode, e-mail to be sent is in the outbox.

**Test procedure**
Send an e-mail. While the e-mail is transmitted, cancel the upload session. Verify that the e-mail to be sent is still available in the MS and that the recipient did not receive the incomplete e-mail.

**Expected behaviour**
The e-mail is still available in the MS and recipient does not receive an incomplete e-mail.

##### 49.4.1.2 Loss of coverage while sending a message

**Description**
Verification that after losing coverage while uploading an e-mail, the message is still available.

**Reason for test**
To ensure that after losing coverage while uploading an e-mail, the message is still available.
49.4.1.3   Maximum message size exceeded when sending an E-Mail

Description
Verification that the sending terminal displays an error message when the maximum message size which is restricted by the terminal is exceeded.

Reason for test
To ensure that the sending terminal displays an error message when the maximum message size which is restricted by the terminal is exceeded.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode, picture and sound objects available in the data folder of the MS.

Test procedure
Create a new e-mail and add so many picture and sound objects that the maximum message size will be exceeded. Try to send the message. The MS should display an error message that the maximum message size is exceeded. Verify that the MS displays the error message correctly and that it displays that the maximum message size is exceed.

Note: The maximum message size supported by the MS may vary depending on the terminal itself. Usually the maximum message size is set to 50 kByte)

Expected behaviour
The MS interprets the error message correctly and it displays that the maximum message size is exceeded.

49.4.1.4   Send E-Mail when MS is out of coverage

Description
Verification that the MS behaves correctly on e-mail sending when the MS is out of coverage.

Reason for test
To ensure that the MS behaves correctly on e-mail sending when the MS is out of coverage.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS out of network coverage.

Test procedure
Create a new e-mail and try to send the message when the MS is out of coverage. Verify that the MS displays an error message indicating that it is out of network coverage and that the MS saves the
message to its memory. As soon as the MS returns to idle mode it shall either send the e-mail automatically or that it is possible to send the message again manually.

Expected behaviour
When regaining network coverage, the MS either sends the e-mail automatically or it is possible to send the message again manually.

49.4.2 E-Mail multitask interactions

49.4.2.1 Incoming Voice Call during downloading E-Mail

Description
Verification that it is possible to receive a Voice Call during the download session for e-mail without losing the e-mail notification.

Reason for test
To ensure that it is possible to receive a Voice Call during the download session for e-mail without losing the e-mail notification.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode. Incoming CS calls during active GPRS session supported by the network.

Test procedure
Receive an e-mail and start to download the message. During the download session receive an incoming Voice Call. Answer the call. The download session shall be interrupted. End the call and verify that the e-mail notification is still available and that it is possible to download the e-mail again.

Expected behaviour
The MMS notification is still available and it is possible to download the MMS again.

49.4.2.2 Incoming CS Short Message during downloading E-Mail

Description
Verification that it is possible to receive a Short Message (CS mode) during the download session for e-mail without losing the e-mail notification.

Reason for test
To ensure that it is possible to receive a Short Message (CS mode) during the download session for e-mail without losing the e-mail notification.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in idle mode. Incoming Short Message (CS) during active GPRS session supported by the network.

Test procedure
Receive an e-mail and start to download the message. During the download session receive Short Message on the CS channel. Read the Short Message. The download session shall be interrupted. Verify that the e-mail notification is still available and that it is possible to download the e-mail again.

Expected behaviour
The e-mail notification is still available and it is possible to download the e-mail again.
49.4.2.3 Incoming E-Mail during an active call

Description
Verification that it is possible to receive an e-mail notification during an active call.

Reason for test
To ensure that it is possible to receive an e-mail notification during an active call.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in Active Call Mode

Test procedure
1. Perform a Voice Call. During the call receive an e-mail. When receiving the e-mail notification, the call shall not be interrupted. End the call and verify that the notification of the e-mail is still available and that it is possible to download the e-mail.
2. Repeat the test performing a CS Data Call.

Expected behaviour
The call does not drop. The e-mail notification is still available and it is possible to download the e-mail.

49.4.2.4 Receiving an E-Mail during an active WAP Session

Description
Verification that it is possible to receive an E-Mail notification during an active call.

Reason for test
To ensure that it is possible to receive an E-Mail notification during an active call.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS in a WAP session.

Test procedure
Start a WAP session. While the WAP session is active, receive an e-mail. The MS shall save the e-mail notification while the WAP session is still active. Then check the e-mail notification and start to download the new e-mail. The MS shall close the active WAP session and start to connect to the e-mail browser to download the message. Verify that the e-mail is completely downloaded.

Expected behaviour
The e-mail notification is still available and it is possible to download the complete e-mail.

49.5 E-Mail Settings

49.5.1 E-Mail Setting with POP3 protocol

Description
Verification that E-Mail settings with POP3 protocol works properly.

Reason for test
To ensure that E-Mail settings with POP3 protocol works properly.

Related GSM core specifications
RFC2821, RFC 1939
Initial configuration
MS with POP3 protocol settings available, MS in idle mode.

Test procedure
All related POP3 settings with the ISP’s settings is set in the MS. After the settings are completed, try to send and receive an e-mail.

Expected behaviour
After settings completed e-mail sending & receiving is working properly.

49.5.2 E-Mail Setting with IMAP4 protocol

Description
Verification that E-Mail settings with IMAP4 protocol works properly.

Reason for test
To ensure that E-Mail settings with IMAP4 protocol works properly.

Related GSM core specifications
RFC2821, RFC 1939

Initial configuration
MS with IMAP4 protocol settings available, MS in idle mode.

Test procedure
All related IMAP4 protocol settings with the ISP’s settings is set in the MS. After the settings are completed, try to send and receive an e-mail.

Expected behaviour
After settings completed e-mail sending & receiving is working properly.

50 DRM Usability

NOTE: The tests of this part should be applicable on DRM feature supported terminal.

50.1 Revoked certificate notification

Description
Verification that the MS correctly displays a warning message to the user if the certificate of the device has been revoked.

Reason for test
The MS shall correctly display a warning message to the user if the certificate of the device has been revoked.

Related GSM core specifications
None

Initial configuration
Ad-hoc RI Server with a specific test certificate (for example the CMLA Dev System Rights Issuer Certificate [1]). RI Server manufacturer will install the needed cryptographic data.

The terminal is pre-provisioned with a specific test certificate that has been revoked by the certification authority (for example one of the CMLA revoked device development key & certificate pairs [1]). Terminal manufacturer will install the needed cryptographic data.

MS not yet registered with the RI server

MS downloads a DRM-protected content whose RIURL links to the ad-hoc RI Server
Test procedure

1. User tries to consume the DRM-protected content without the appropriate license
2. MS asks the user whether he wants to buy an appropriate license for consuming the DRM-protected content.
3. User connects to the ad-hoc RI server in order to acquire an appropriate license for the DRM-protected content.

Expected behaviour
The device shows a warning message telling the user to contact a technical assistance center.


50.2 License files should not be visible by the user

Description
Verification that the Device doesn't display the license files to the user (e.g. after the installation of a file manager)

Reason for test
To ensure that non appropriate actions cannot be performed by the user

Related GSM core specifications
None

Initial configuration
MS in idle mode.

Test procedure

1. MS receives a valid DRM file with license
2. MS checks that the file and the licence are valid by playing that file
3. The User tries to locate the license files e.g. in the file system of the terminal, via the file manager application pre-installed in the device

Expected behaviour
The user does not see the license files in the file system of the device using the default file manager with default settings.

50.3 Graphical indication to the user about the DRM file

50.3.1 Graphical indication to the User if a file is a DRM file with license

Description
Verification that there is a graphical indication whether a File is DRM-protected and is associated with a valid license.

Reason for test
User should receive a graphical indication (i.e. through an appropriate icon) whether a file is DRM-protected and is associated with a valid license, in order to handle it accordingly

Related GSM core specifications
None.

Initial configuration
MS in idle mode.

MS with a ‘content gallery’ application displaying the content library of the user
Test procedure

1. MS receives a valid DRM file with an associated license
2. The content gallery application of the MS displays conveniently (e.g. through an appropriate icon) that the DRM file is associated with a valid license

Expected behaviour

User should receive a graphical indication (e.g. through an appropriate icon) that a file is DRM-protected and is associated with a valid license

50.3.2 Graphical indication to the User if a file is a DRM file without license

Description

Verification that there is a graphical indication whether a file is DRM-protected and is not associated with a valid license in order to handle it accordingly

Reason for test

User should receive a graphical indication (i.e. through an appropriate icon) whether a file is DRM-protected and is not associated with a valid license, in order to handle it accordingly

Related GSM core specifications

None

Initial configuration

MS in idle mode
MS with a ‘content gallery’ application displaying the content library of the user

Test procedure

1. MS receives a valid DRM file without an associated license
2. The content gallery application of the MS displays conveniently (e.g. through an appropriate icon) that the DRM file is not associated with a valid license

Expected behaviour

User should receive a graphical indication (e.g. through an appropriate icon) that a file is DRM-protected and is not associated with a valid license

50.3.3 Graphical indication to the User if a file is in plaintext

Description

Verification that there is a graphical indication whether a file is plaintext (i.e. unprotected) in order to handle it accordingly

Reason for test

User should receive a graphical indication (i.e. through an appropriate icon) if a file is in plaintext (i.e. unprotected) in order to handle it accordingly

Related GSM core specifications

None

Initial configuration

MS in idle mode.
MS with a ‘content gallery’ application displaying the content library of the user

Test procedure

1. put a non DRM file on the MS
2. The content gallery application of the MS displays conveniently (e.g. through an appropriate icon) that the file is in plaintext (i.e. unprotected)
Expected behaviour
User should receive a graphical indication (e.g. through an appropriate icon) that a file is in plaintext (i.e. unprotected)

50.3.4 Graphical indication to the User if a file is forward-locked

Description
Verification that there is a graphical indication whether a file is forward-locked, in order to handle it accordingly.

Reason for test
User should receive a graphical indication (i.e. through an appropriate icon) whether a file is forward-locked in order to handle it accordingly

Related GSM core specifications
None

Initial configuration
MS in idle mode.
MS with a ‘content gallery’ application displaying the content library of the user

Test procedure
1. MS receives a valid DRM file protected with forward lock
2. The content gallery application of the MS displays conveniently (e.g. through an appropriate icon) that the file is forward locked i.e. the file should be playable but it cannot be forwarded (e.g. using Bluetooth or IrDA)

Expected behaviour
User should receive a graphical indication (i.e. through an appropriate icon) that a file is forward-locked

50.4 The user is informed if trying to perform unauthorized actions

50.4.1 Verification that the user is informed correctly in the event of opening a DRM file not associated with a valid license

Description
Verification that the user is informed with an appropriate message if trying to open a DRM file not associated with a valid license

Reason for test
User should be informed with an appropriate message if trying to open a DRM file not associated with a valid license

Related GSM core specifications
None

Initial configuration
MS in idle mode.

Test procedure
1. MS receives a DRM-protected file without an appropriate license
2. When requested to play the DRM-protected file, MS verifies it lacks of a valid license
3. The DRM-protected file is not played
Expected behaviour
The user is informed with an appropriate message that he is trying to open a DRM file not associated with a valid license, and he is ideally asked whether he wants to connect to the server for buying a license for that content.

50.4.2 Verification that the user is informed with an appropriate message if he tries to forward a forward-locked file

Description
Verification that the user is informed with an appropriate message if he tries to forward a forward-locked file

Reason for test
User should be informed with an appropriate message if he tries to forward a forward-locked file in order to understand correctly the reason why the forwarding is not permitted

Related GSM core specifications
None

Initial configuration
MS in idle mode

Test procedure
1. MS receives a valid DRM file protected with forward lock protection
2. MS checks that the file is forward-locked: the file should be playable without any restriction but it cannot be forwarded (e.g. via Bluetooth and/or IrDA)

Expected behaviour
User should be informed that he is trying to forward a forward-locked file. The MS shall not forward a forward-locked file.

50.5 The user is informed when receiving an invalid DRM file/license

50.5.1 Verification that the user is informed with an appropriate message when rendering an invalid DRM file

Description
Verification that the user is informed with an appropriate message when rendering an invalid DRM-protected file

Reason for test
For achieving a good user experience it is important to provide clear information about the validity of a protected file. If a protected file is invalid, the user may want to delete it.

Related GSM core specifications
None.

Initial configuration
MS in idle mode

Ad-hoc file packager producing invalid DRM-protected files or alternatively
A DRM-protected file conveniently edited (e.g. with a hexadecimal editor installed on a personal computer) in a way it becomes invalid.
Test procedure
1. MS receives an invalid protected file (e.g. from a user or a Content Provider)
   2a. When trying to open it, MS verifies the file is invalid and displays a message box to inform the user.
   2b. Alternatively, when trying to open the DRM-protected file, MS verifies it is not associated with any license and therefore it asks the user to download an appropriate license. After the reception of the license, the MS verifies the file is invalid and displays a message box to inform the user.

Expected behaviour
User is informed with an appropriate message saying that the file is invalid and may be deleted.

50.5.2 Verification that the user is informed by an appropriate message if he receives an invalid license

Description
Verification that the user is informed with an appropriate message when receiving an invalid license

Reason for test
For achieving a good user experience it is important to provide clear information to the user when receiving an invalid (incorrect) license

Related GSM core specifications
None

Initial configuration
MS in idle mode.

Ad-hoc RI Server implementation issuing invalid (incorrect) licenses
Ad-hoc file packager producing DRM-protected files that provide a link to the ad-hoc RI server for downloading invalid (incorrect) licenses

Test procedure
1. MS receives a DRM-protected file without an appropriate license
   2. When trying to play the DRM-protected file, MS can't find a valid license associated with it and asks the user to acquire a license
   3. The user agrees to download a license from the ad-hoc RI. The downloaded license is invalid (incorrect)

Expected behaviour
The device informs the user the license is incorrect.

50.6 The user is informed when a DRM-protected file provides a preview function

Description
Verification that the user is informed when a DRM-protected file provides a preview function

Reason for test
It is important that the user is informed if a protected file provides a preview function

Related GSM core specifications
None.

Initial configuration
MS in idle mode.
Test procedure

1. MS receives from a content provider a DRM-protected file providing a preview function but not associated with an appropriate license
2. User tries to play that file

Expected behaviour
The user is informed that the DRM-protected file provides a preview function.

51 IP Multimedia Subsystem (IMS)

51.1 Voice over IMS (VoLTE)

51.1.1 Registration and Authentication to IMS

51.1.1.1 SIP Registration and Authentication Procedure – via “well known IM” APN (IR88)

[Tests to be defined]

51.1.2 Basic Voice Case - PS

<table>
<thead>
<tr>
<th>Test case number</th>
<th>Test case title</th>
<th>Voice only (Scenario A)</th>
<th>Voice + FTP DL (Scenario B)</th>
<th>Voice + FTP UL (Scenario C)</th>
<th>Voice + FTP UL&amp;DL (Scenario D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.1.2.1 Mobile Originated Voice over IMS (VoLTE) call - Voice set up first</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>51.1.2.2 Mobile Terminated Voice over IMS (VoLTE) call - Voice set up first</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>51.1.2.3 Mobile Originated Voice over IMS (VoLTE) call - FTP set up first</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>51.1.2.4 Mobile Terminated Voice over IMS (VoLTE) call - FTP set up first</td>
<td>n/a</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Description
The UE shall successfully perform a voice call over IMS. The UE uses the SIP IMS client on the terminal.

Related 3GPP core specifications
3GPP TS 24.229

Reason for test
To verify the terminal establishes voice calls over IMS (VoLTE) by using the SIP client, and behave as expected from the user perspective, also while other services will be started or without losing already started services.

Initial configuration
E-UTRAN cells are available
The UE and NW are supporting Voice over LTE (VoLTE)
The terminal is successfully registered in E-UTRAN cell for IMS service.

**Test procedure**

Initiate voice call to/from a phone (PSTN or mobile phone) according to the test cases listed above. The voice calls should be performed additionally under different FTP data transfer scenarios as indicated in the scenarios above.

**Scenario A:**

Only voice call over IMS (VoLTE) is required for the scenario A.

**Scenario B:**

A voice call over IMS (VoLTE) and a FTP download are required for the scenario B. Depending on the test scenario either the voice call or the FTP transfer is set up and running before the other service will be initiated.

**Scenario C:**

A voice call over IMS (VoLTE) and a FTP upload are required for the scenario C. Depending on the test scenario either the voice call or the FTP transfer is set up and running before the other service will be initiated.

**Scenario D:**

A voice call over IMS (VoLTE) and simultaneous FTP up- and download are required for the scenario D. Depending on the test scenario either the voice call or the FTP transfer is set up and running before the other service will be initiated.

**Expected behaviour**

The voice connection in both directions is established, the voice quality is not reduced by FTP transfer and an active voice call indicator is displayed. The FTP data transfer is established and not interrupted or distorted by the call establishment.

### 51.1.3 Emergency Calls

#### 51.1.3.1 Basic Emergency Call Setup

**Description**

The UE shall successfully perform an emergency call over IMS. The UE uses the SIP IMS client on the terminal.

**Related 3GPP core specifications**

3GPP TS 23.167, TS 23.228, TS 23.401 and TS 24.229

**Reason for test**

To verify the terminal establishes an emergency call over IMS by using the SIP client. The UE shall use extended service request in order to signal the prioritisation in the NW.

**Initial configuration**

E-UTRAN cells are available

The UE and NW are supporting Voice over LTE (VoLTE)

The terminal is successfully registered in E-UTRAN cell for IMS service.

**Test procedure**

1. Initiate an emergency call to emergency number, e.g. 112
2. Verify the call establishment procedure is performed.

**Expected behaviour**

1. -
2. An emergency connection in both directions is established and an active voice call indicator is displayed.
51.1.4 Supplementary Services according GSMA IR.92

51.1.4.1 Originating Identification Presentation (OIP)
The Originating Identification Presentation (OIP) service provides the terminating user with the possibility of receiving identity information in order to identify the originating user.

51.1.4.1.1 OIP Active

Description
For terminating users that subscribe to the OIP service, and if network provided identity information about the originator is available, and if presentation is allowed, the network shall include that information in the requests sent to the UE.

Related GSM core specifications
TS 24.607 sub clause 4.3.3; 4.5.2.12

Reason for test
To ensure the DUT displays the public user identity of the originating user and/or user-provided identity

Initial configuration
UE contains either ISIM and USIM applications or only USIM application on UICC.

UE is configured with the name of the XCAP root directory on the XCAP server and the user's directory name

Test procedure
1. Receive an incoming call from Client 1
2. Answer call at DUT.

Expected behaviour
1. Confirm DUT displays the corresponding user identity during the call
2. A connection in both directions is established.

51.1.4.1.2 OIP Inactive

Description
For terminating users that do not subscribe to the OIP service, the network shall not send the network provided identity information about the originator in the requests sent to the UE, even if that information is available, and if presentation is allowed.

If the public user identity is not available at the terminating network (for reasons such as interworking), then the network shall indicate to the terminating user that the public user identity was not included for reasons other than that the originating user invoked the OIR service.

Additionally, the network may prevent the transmission of any UE-provided identity information

Related GSM core specifications
TS 24.607 sub clause 4.3.3; 4.5.2.12

Reason for test
To ensure the DUT displays “unknown” in case if user identity is not provided.

UE contains either ISIM and USIM applications or only USIM application on UICC.

UE is configured with the name of the XCAP root directory on the XCAP server and the user's directory name

Test procedure
1. Receive an incoming call from Client 1
2. Answer call at DUT.

Expected behaviour
1. Confirm DUT displays “unknown”
2. A connection in both directions is established.

51.1.5 VoLTE according GSMA IR.92 - CS [PS Voice preferred, CS Voice as secondary] with ISR
[Tests to be defined]

51.2 PS Performances
[Tests to be defined]

51.2.1 PS Performances (good coverage - relative measurement)
[Tests to be defined]

51.2.2 PS Performances (good coverage - absolute measurement)
[Tests to be defined]

51.2.3 PS Performances (During Mobility Drive Tests - relative Measurement)
[Tests to be defined]

51.3 SMS over IMS
[Tests to be defined]

52 IPv6

Note: In GERAN and UTRAN the term “PDP context activation” is used for activating IP connectivity, while in E-UTRAN the term “default bearer activation” is used. In the following chapter, the term “bearer activation” is used for both.

52.1 Establishment of an IPv6-only Bearer

Description
Establishment of an IPv6-only bearer over GERAN, UTRAN and/or E-UTRAN with subsequent verification of IPv6 DNS reachability and web browsing to IPv6 web sites.

Related core specifications
3GPP TS 27.007, clause 10.1.1 (PDP context definition)
3GPP TS 24.008, table 10.5.155 (Packet data protocol address information element)
3GPP TS 24.301, clause 9.9.4.9 (PDN Address, E-UTRAN)

Reason for test
Verify that the UE can successfully establish an IPv6 only bearer over GERAN, UTRAN and/or E-UTRAN.

Initial configuration
• UE is powered off.
• IPv6 capable notebook available.
• UE is configured to establish an IPv6 only PDP context / IPv6 only default bearer.
• In case the UE provides connectivity to an external device (e.g. a notebook), the external device is configured for IPv6 over the network connection provided by the UE.

Test procedure
1. Power on the UE and establish a mobile originated PDP context activation / default bearer. This part of the procedure is either performed automatically by the device after power on, by the user requesting connectivity, or by an external device (e.g. notebook) requesting connectivity from the UE (e.g. via at-commands).
2. Open a web browser on the UE or external device. Enter a URL (not an IP address!) of an IPv6 only web site.
3. Enter a URL (not an IP address) of a web site that is reachable by both IPv4 and IPv6.

Expected behaviour
1. The UE establishes an IPv6 connection and successfully retrieves information about the DNS server as instructed by the network (e.g. part of the PDP context activation accept message, DHCP, etc.). In case the connectivity is requested by an external device, the IPv6 address and DNS address(es) are properly forwarded to the external device.
2. The UE or external device can successfully query the DNS server.

For an IPv6 only reachable web site, the UE only receives an IPv6 address for the requested URL of the web site from the DNS server. The web browser then successfully loads the page and displays it. For an IPv4 and IPv6 reachable web site, the UE may receive an IPv4 and IPv6 address from the DNS server. The web browser then successfully loads the page via IPv6 and displays it.

52.2 Establishment of an IPv4 + IPv6 Bearer

Description
Establishment of a dual stack IPv4v6 bearer over GERAN, UTRAN and/or E-UTRAN with subsequent verification of IPv4 and IPv6 DNS reachability for web browsing to IPv6 and IPv4 web sites.

Related core specifications
3GPP TS 27.007, clause 10.1.1 (PDP context definition)
3GPP TS 24.008, table 10.5.155 (Packet data protocol address information element)
3GPP TS 24.301, clause 9.9.4.9 (PDN Address, E-UTRAN)

Reason for test
Verify that the UE can successfully establish dual stack IPv4 and IPv6 connectivity over GERAN, UTRAN and/or E-UTRAN.

Initial configuration
• UE is powered off.
• UE is configured to establish a dual stack IPv4v6 PDP context / IPv4v6 default bearer.
• If case the UE provides connectivity to an external device (e.g. a notebook), the external device is configured for dual stack IPv4v6 operation over the network connection provided by the UE.

Test procedure
1. Power on the UE and establish a mobile originated PDP context activation / default bearer. This part of the procedure is either performed automatically by the device after power on, by the user requesting connectivity, or by an external device (e.g. notebook) requesting connectivity from the UE (e.g. via at-commands).
2. Open a web browser on the UE or external device. Enter a URL (not an IP address!) of an IPv6 only web site.
3. Enter a URL (not an IP address) of a web site that is reachable by both IPv4 and IPv6.
4. Enter a URL (not an IP address) of a web site that is reachable by IPv4 only.
Expected behaviour

1. The UE establishes an IPv4v6 dual stack connection and successfully retrieves information about the DNS server as instructed by the network (e.g. part of the PDP context activation accept message, DHCP, etc.). In case the connectivity is requested by an external device, the IPv4 address, the IPv6 address and DNS address(es) are properly forwarded to the external device.

2. The UE or external device can successfully query the DNS server. The DNS server shall be queried for an IPv4 and an IPv6 address (i.e. a DNS A request and a DNS AAAA request).

   For an IPv6 only reachable web site, the UE only receives an IPv6 address for the requested URL of the web site from the DNS server. The web browser then successfully loads the page and displays it.

3. For an IPv4 and IPv6 reachable web site, the UE receives an IPv4 and IPv6 address from the DNS server. The web browser then successfully loads the page and displays it. It shall be verified that the IPv6 address is used and NOT the IPv4 address as per RFC 3484 Chapter 2.1.

4. For an IPv4 reachable web site, the web page is successfully loaded over IPv4.

52.3 Establishment of an IPv4 + IPv6 Bearer with IPv4 only success

Description

Establishment of a dual stack IPv4v6 bearer over GERAN, UTRAN and/or E-UTRAN that results in an IPv4-only bearer response. Subsequently, IPv4 connectivity via web browsing is tested.

Related core specifications

3GPP TS 27.007, clause 10.1.1 (PDP context definition)
3GPP TS 24.008, table 10.5.155 (Packet data protocol address information element)
3GPP TS 24.301, clause 9.9.4.9 (PDN Address, E-UTRAN)

Reason for test

Verify that the UE requests dual stack IPv4 and IPv6 connectivity over GERAN, UTRAN and/or E-UTRAN and accepts an IPv4-only response.

Initial configuration

- UE is powered off.
- UE is configured to establish a dual stack IPv4v6 PDP context / IPv4v6 default bearer.
- If case the UE provides connectivity to an external device (e.g. a notebook), the external device is configured for dual stack IPv4v6 operation over the network connection provided by the UE.

Test procedure

1. Power on the UE and establish a mobile originated PDP context activation / default bearer. This part of the procedure is either performed automatically by the device after power on, by the user requesting connectivity, or by an external device (e.g. notebook) requesting connectivity from the UE (e.g. via at-commands).

2. Verify that the UE uses the proper IPv4v6 PDP type number value in the PDP context request message (GERAN/UTRAN) and the proper IPv4v6 PDN type value in the default bearer activation (E-UTRAN). This is required to ensure the UE requests dual stack operation and not IPv4 only.

3. Verify that the PDP context activation accept / default bearer activation message only contains an IPv4 address. No IPv6 address information is present.

4. Enter a URL (not an IP address) of a web site that is reachable by both IPv4 and IPv6.
Expected behaviour
1. The UE establishes an IPv4 connection and successfully retrieves information about the DNS server as instructed by the network. In case the connectivity is requested by an external device, the IPv4 address and DNS address(es) are properly forwarded to the external device.
2. The UE or external device can successfully query the DNS server. The DNS server shall be queried for an IPv4 address only. (i.e. a DNS A request).
3. -
4. For an IPv4 and IPv6 reachable web site, the UE receives an IPv4 address from the DNS server. The web browser then successfully loads the page and displays it.

52.4 Establishment of separate IPv4 and IPv6 Bearers

Description
Establishment of individual IPv4 and IPv6 bearers over GERAN, UTRAN and/or E-UTRAN with subsequent verification of IPv4 and IPv6 DNS reachability for web browsing to IPv6 and IPv4 web sites if supported by the device.

Related core specifications
3GPP TS 27.007, clause 10.1.1 (PDP context definition)
3GPP TS 24.008, table 10.5.155 (Packet data protocol address information element)
3GPP TS 24.301, clause 9.9.4.9 (PDN Address, E-UTRAN)

Reason for test
Verify that the UE can successfully establish IPv4 and IPv6 connectivity over separate bearers over GERAN, UTRAN and/or E-UTRAN.

Initial configuration
- UE is powered off.
- UE is configured to establish separate bearers for IPv4 and IPv6 (i.e. one PDP context activation for IPv4 and a separate PDP context activation for IPv6).

Test procedure
1. Power on the UE and establish two mobile originated PDP context activations / default bearers. This part of the procedure is either performed automatically by the device after power on or by the user requesting connectivity.
2. Open a web browser on the UE or external device. Enter a URL (not an IP address!) of an IPv6 only web site.
3. Enter a URL (not an IP address) of a web site that is reachable by both IPv4 and IPv6.
4. Enter a URL (not an IP address) of a web site that is reachable by IPv4 only.
   Note: In case the operating system of the UE only supports one of the two bearers per application, use two different applications to test that concurrent IPv4 and IPv6 connectivity is working.

Expected behaviour
1. The UE establishes an IPv4 bearer and a separate IPv6 bearer. DNS server information is retrieved as instructed by the network (e.g. part of the PDP context activation accept message, DHCP, etc.).
2. The UE or external device can successfully query the DNS server. The DNS server shall be queried for an IPv4 and an IPv6 address (i.e. a DNS A request and a DNS AAAA request).

For an IPv6 only reachable web site, the UE only receives an IPv6 address for the requested URL of the web site from the DNS server. The web browser then successfully loads the page and displays it.
3. For an IPv4 and IPv6 reachable web site, the UE receives an IPv4 and IPv6 address from the DNS server. The web browser then successfully loads the page and displays it. It shall be verified that the IPv6 address is used and NOT the IPv4 address as per RFC 3484 Chapter 2.1.

4. For an IPv4 reachable web site, the web page is successfully loaded over IPv4.

Note: In case the operating system of the UE only supports one of the two bearers per application, the concurrent use of IPv4 / IPv6 shall be tested with separate applications.

52.5 IPv6 Privacy Extension verification

Description

Establishment of IPv6 connectivity over GERAN, UTRAN and/or E-UTRAN with subsequent verification that the device has selected a random IPv6 address from the IPv6 address space given to it by the network.

Note that IPv6 privacy extensions are an optional feature and might not be implemented in the device.

Related core specifications

3GPP TS 27.007, clause 10.1.1 (PDP context definition)
3GPP TS 24.008, table 10.5.155 (Packet data protocol address information element)
3GPP TS 24.301, clause 9.9.4.9 (PDN Address, E-UTRAN)
IETF RFC 4941

Reason for test

Verify that a random IPv6 address is generated by the UE each time a bearer is established to protect user privacy.

Note: This mechanism is specified by IETF RFC 4941 and activated in major operating systems by default and new devices should be checked for the proper activation of this functionality.

Initial configuration

- UE is powered off.
- UE is configured to establish a dual stack IPv4v6 PDP context / IPv4v6 default bearer.
- In case the UE provides connectivity to an external device (e.g. a notebook), the external device is configured for dual stack IPv4v6 operation over the network connection provided by the UE.

Test procedure

1. Power on the UE and establish a mobile originated PDP context activation / default bearer. This part of the procedure is either performed automatically by the device after power on, by the user requesting connectivity, or by an external device (e.g. notebook) requesting connectivity from the UE (e.g. via at commands).
2. Note the IPv6 address of the device.
3. End the PDP context / bearer and establish a new one.
4. Note the IP address of the device.
5. Perform the same test with an IPv6 only PDP context / bearer.

Expected behaviour

1. The UE establishes an IPv4v6 dual stack connection and successfully retrieves information about the DNS server as instructed by the network (e.g. part of the PDP context activation accept message, DHCP, etc.). In case the connectivity is requested by an external device, the IPv4 address, the IPv6 address and DNS address(es) are properly forwarded to the external device.
2. The host part of the IPv6 address is different after each PDP context activation / bearer establishment and is generated according to IETF RFC 4941. (Note: The IPv6 prefix may or may
not the identical between bearer activations but this is decided by the network and outside the control of the UE).

53 Identification of Network Names

53.1 List of Network Names

Description
This test case verifies that the UE contains an up to date list of network names so it shows

- The correct home network name on the idle screen
- The correct roaming network name on the idle screen
- The correct networks names after a manual network scan.

Reason for test
If the list of network names in mobile devices is outdated it leads to incorrect network names being shown to the subscriber during manual network selection and on the idle screen when on the home network or when the subscriber roams to a foreign country.

Related GSM core specifications
3GPP TS 27.007, clause 7.21

Initial configuration
None.

Test procedure
1. Retrieve the list of network names from the UE. How this is done is UE specific. Many UEs support the at+copn command as described in 3GPP TS 27.007.
2. Compare the list of network names from the UE with an up to date list of network operator names. The source for this is the SE.13 document from the GSMA.
3. Additionally, perform a manual network scan and check the network names returned. (Note that network names on the SIM card in EF_SPN and EF_PNN take precedence over the network names stored in the UE).
4. Check the name of the operator on the idle screen. (Network names on the SIM card take precedence, see 3.).

Expected behaviour
2. The network names in the list of the UE are identical to those found in an up to date list of network operator names such as the SE.13 which will be no more than 6 months older than the date of test.
4. The network names shown in the manual network selection list and the network name on the idle screen correspond to those in the SE.13 list or to those provided on the SIM card if present. If MCC/MNC record is present but network type cannot be matched (e.g. W-CDMA with MNC1 and GSM with MNC2), use the MCC/MNC record for all network types.

54 Test of Ciphering Indicator

Note: Additional to live networks, the use of SIM simulators and/or network simulators and/or test bed networks are also permitted to verify the fulfilment of the Ciphering Indicator requirements.

These tests are applicable to both GERAN and UTRA technology.
54.1  Presentation Enabled by the SIM/USIM

Description
The UE shall indicate to the user that the 3GPP radio interface ciphering (user plane) is not switched on.

Related 3GPP core specifications
3GPP TS 22.101, section 14 (Types of features of UEs)
GSM TS 02.07, section 2 (Requirements for implementing MS features) and section Annex B.1.26 (Ciphering Indicator)
3GPP TS 31.102, section 4.2.18 (EF<sub>AD</sub> (Administrative Data))
GSM TS 11.11, section 10.3.18 (EF<sub>AD</sub> (Administrative data))

Reason for test
To verify that the UE successfully indicates to the user that the 3GPP radio interface ciphering (user plane) is not switched on.

Initial configuration
SIM/USIM Card settings (EF<sub>AD</sub>) are set to “ciphering indicator feature enabled”
The UE is attached in Packet and Circuit mode.
Ciphering in the network is not switched on.

Test procedure
Scenario A:
Setup a CS Voice Call in GERAN Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

Scenario B:
Setup a PS Data Connection in GERAN Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

Scenario C:
Setup a CS Voice Call in UTRA Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

Scenario D:
Setup a PS Data Connection in UTRA Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

Expected behaviour
For all Scenarios: The UE indicates to the user that ciphering is not switched on.

54.2  Presentation Disabled by the SIM/USIM

54.2.1  Non-Presentation of Ciphering Indicator

Description
The UE shall not indicate to the user that the 3GPP radio interface ciphering (user plane) is not switched on, when the SIM/USIM settings are set to “ciphering indicator feature disabled”.

Related 3GPP core specifications
3GPP TS 22.101, section 14 (Types of features of UEs)
GSM TS 02.07, section 2 (Requirements for implementing MS features) and section Annex B.1.26 (Ciphering Indicator)
3GPP TS 31.102, section 4.2.18 (EF<sub>AD</sub> (Administrative Data))
Reason for test
To verify that the UE does not indicate to the user that the 3GPP radio interface ciphering (user plane) is not switched on when the SIM/USIM settings are set to “ciphering indicator feature disabled”.

Initial configuration
SIM/USIM Card settings (EF\textsubscript{AD}) are set to “ciphering indicator feature disabled”
The UE is attached in Packet and Circuit mode.

Scenario A:
Setup a CS Voice Call in GERAN Radio Access Technology which is not ciphered. Check that the UE does not indicate to the user that ciphering is not switched on.

Scenario B:
Setup a PS Data Connection in GERAN Radio Access Technology which is not ciphered. Check that the UE does not indicate to the user that ciphering is not switched on.

Scenario C:
Setup a CS Voice Call in UTRA Radio Access Technology which is not ciphered. Check that the UE does not indicate to the user that ciphering is not switched on.

Scenario D:
Setup a PS Data Connection in UTRA Radio Access Technology which is not ciphered. Check that the UE does not indicate to the user that ciphering is not switched on.

Expected behaviour
For all Scenarios: The UE does not indicate to the user that ciphering is not switched on.

54.2.2 Presentation of Ciphering Indicator when User Menu overrides SIM/USIM Settings

Description
The UE shall indicate to the user that the 3GPP radio interface ciphering (user plane) is not switched on, when the SIM/USIM settings are set to “ciphering indicator feature disabled” and the user has configured the terminal to override the operator’s data setting in the SIM/USIM.

Related 3GPP core specifications
3GPP TS 22.101, section 14 (Types of features of UEs)
GSM TS 02.07, section 2 (Requirements for implementing MS features) and section Annex B.1.26 (Ciphering Indicator)
3GPP TS 31.102, section 4.2.18 (EF\textsubscript{AD} (Administrative Data))
GSM TS 11.11, section 10.3.18 (EF\textsubscript{AD} (Administrative data))

Reason for test
To verify that the UE successfully indicates to the user that the 3GPP radio interface ciphering (user plane) is not switched on, when the SIM/USIM settings are set to “ciphering indicator feature disabled” and the user has configured the terminal to override the operator’s data setting in the SIM/USIM.

Initial configuration
SIM/USIM Card settings (EF\textsubscript{AD}) are set to “ciphering indicator feature disabled”
The UE is configured to override the operator’s data setting in the SIM/USIM.
The UE is attached in Packet and Circuit mode. Ciphering in the network is not switched on.

**Test procedure**

**Scenario A:**
Setup a CS Voice Call in GERAN Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

**Scenario B:**
Setup a PS Data Connection in GERAN Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

**Scenario C:**
Setup a CS Voice Call in UTRA Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

**Scenario D:**
Setup a PS Data Connection in UTRA Radio Access Technology which is not ciphered. Check that the UE successfully indicates to the user that ciphering is not switched on.

**Expected behaviour**
For all Scenarios: The UE indicates to the user that ciphering is not switched on.

### 55 Rich Communication Suite (RCS)

Note: the following test cases are based on Rich Communication Suite Enhanced version 1.2 x and associated reference documents (precisely: RCS 1.2.2 + Hotfixes), which can be found under [http://www.gsma.com/rcs/specifications](http://www.gsma.com/rcs/specifications). Any reference document mentioned in this section can be found also under the same GSMA reference link as mentioned earlier.

These Test Cases apply to RCS in general. Test Cases specifically created for newer versions of RCS will be added in a separate sub section.

#### 55.1 Configuration

##### 55.1.1 RCS Service availability and User Discovery in address book (initial check of capabilities) after first-time successful configuration

**Description**
Verify the correct behaviour of the UE when it performs the first-time successful configuration. The UE shall show which of the contacts available in the address book have currently access to RCS services.

**Related core specifications**
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**
This test shall verify that the first-time configuration of the UE is successful, and is followed by a capability exchange with all the contacts available in the address book, so currently registered RCS users are identified.

**Initial configuration**
Network under test implements autoprovisioning and autoconfiguration process based on either:
- OMA-DM server based on the managed object configuration proposed in Annex A, section A.2; or
- OMA-CP server based on OMA-CP specific configuration proposed in Annex A, section A.2 and A.3; or
HTTP Autoconfiguration Server described in section 2.2.2.1.2 of GSMA RCS specification and Annex A

UE1/IM CARD1 pair (User 1) has not been previous provisioned and configured in the network. SIM CARD1 should not be inserted to UE1.

RCS services have been previously configured successfully on the UE2/SIM CARD2 pair (User 2). UE2 is powered on.

Both UE1 and UE2 camp in any radio network that allows at least IM.

**Test Procedure**

1. UE 1 is powered on without SIM Card.
2. User 2 MSISDN is added to UE1 phonebook.
3. UE 1 is powered off, SIM CARD1 is inserted, UE 1 is powered on again
4. User 1 opens chat application, requests to open a new chat and checks the contacts from its phonebook that currently have access to RCS services.

**Expected behaviour**

1. –
2. –
3. UE1 should contact the autoprovisioning and autoconfiguration server. The server shall validate the SIM CARD/UE, provision the user and send a valid configuration to the UE. Configuration takes places seamlessly to the user, and RCS UX elements are enabled. The welcome message is displayed and the user accepts Terms and Conditions (if enabled on the test network). Once the configuration is successfully sent, User 1 can access RCS services. Following a first-time registration a capability exchange is made with the contacts available in the phonebook, this process can take some time, depending on the number of entries. The background activity does not affect UX.
4. After opening the chat application and requesting to open a chat, the RCS user list is displayed, User 2 is displayed as an available user to initiate a chat.

**55.1.2 RCS Service availability after reboot. Configuration parameters still valid**

**Description**

To verify the correct behaviour of the UE when it is rebooted after first time successful configuration, and configuration parameters are still valid.

**Related core specifications**

GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**

This test shall verify that when a device already configured is rebooted and configuration parameters are still valid (i.e. no reconfiguration is done), the RCS service is also available.

**Initial configuration**

Network under test implements autoprovisioning and autoconfiguration process based on either:

- OMA-DM server based on the managed object configuration proposed in Annex A, section A.2; or
- OMA-CP server based on OMA-CP specific configuration proposed in Annex A, section A.2 and A.3; or
- HTTP Autoconfiguration Server described in section 2.2.2.1.2 of GSMA RCS specification and Annex A

RCS services have been previously configured successfully on the UE1/SIM CARD1 pair (User 1). UE1 is powered off. The validity of the previous configuration is NOT expired (expiration time is network dependent)
RCS services have been previously configured successfully on the UE2/SIM CARD2 pair (User 2). UE2 is powered on.

Both UE1 and UE2 camp in any radio network that allows at least IM.

Test Procedure
1. UE1 is powered on.
2. User 1 selects contact (User 2) from UE1 phonebook.
3. Once capability exchange is finished, test a successful chat from User 1 to User 2 to verify RCS service is available.

Expected behaviour
1. UE1 should NOT contact the autoprovisioning and autoconfiguration server as the configuration is still valid. This process is transparent; the RCS services are available just after boot is completed.
2. A new capability exchange is made when User 1 selects User 2 from the phonebook. User 2 is displayed as available at least via IM.
3. User 1 can perform a successful chat with User 2.

55.1.3 RCS Service availability after reboot and SIM card swap (Client Configuration Storage Management)

Description
This test shall verify the proper behaviour of the UE when SIM CARD is swapped.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify proper client configuration store management when different SIM Cards share the same UE.

Note: Client configuration comprises of a set of configuration parameters that consist of operational parameters and parameters which configure the RCS client behaviour. Client configuration parameters are as specified in Table 4 of RCS core specification (e.g. IM SESSION START, POLLING PERIOD, USE PRESENCE, FT MAX SIZE). All the RCS client configuration data may only be modified by the Service Provider and are not accessible to the terminal user.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2) and UE3/SIM CARD3 (User 3).

SIM CARD1, SIM CARD2 & SIM CARD3 should have different FT MAX SIZE parameter value. (There might be a need to have SIM cards from different operators!) And the FT MAX SIZE for SIM CARD1 should be smaller than SIM CARD 2 FT MAX SIZE value.

All UEs are powered on.
All UEs/clients are registered and the registration timer is far from expiration.
All UE1, UE2 and UE3 camp in any radio network that allows at least IM & File Transfer.
User 1 has already performed a successful file transfer (file size less than SIM card FT MAX Size value) with User 3.

Test Procedure
1. Power off UE1 and UE2, remove SIM CARD1 and SIM CARD2 and insert SIM CARD2 on UE1.
2. Power on UE1, open file transfer application and send file of size which is larger than SIM CARD1 FT MAX SIZE value, but smaller then SIM CARD2 one, to UE3.
3. Power off UE1, remove SIM CARD2 and insert SIM CARD1.
4. Power on UE1 open file transfer and send file of size which is larger than SIM CARD1 FT MAX SIZE value, but smaller then SIM CARD2 one, to UE3.

Expected behaviour

1. –

2. First time configuration process should be completed, configuration takes place seamlessly to the user, and RCS UX elements are enabled. The welcome message is displayed and the user accepts Terms and Conditions (if enabled on the test network). Once the configuration is successfully sent, User 1 (SIM CARD2) can access RCS services, opens file transfer application and file is successfully sent (i.e., User 1 gets no error message).

3. –

4. User 1 (SIM CARD1) could access their previously stored data and a reconfiguration is not required (data still valid). For User 1, the RCS UX and services remain in the same condition as prior to the configuration. User 1 opens file transfer application and user gets an error message for trying to send file of size larger than allowed.

55.1.4 RCS Service availability (Initial start-up procedure) when conflict of clients into the device occurs

Description
Verify the correct behaviour of the UE when two RCS clients are present in the device. This conflict of clients shall not block the correct access to RCS services.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
This test shall verify that when conflict of RCS client occurs in the device the user shall be notified and shall be able to select the preferred RCS client.

Initial configuration
Network under test implements autoprovisioning and autoconfiguration process based on either:

- OMA-DM server based on the managed object configuration proposed in Annex A, section A.2; or
- OMA-CP server based on OMA-CP specific configuration proposed in Annex A, section A.2 and A.3; or
- HTTP Autoconfiguration Server described in section 2.2.2.1.2 of GSMA RCS specification and Annex A

Android joyn clients configured with gsma.joyn. meta-data properties according to the RCS Implementation Guidelines.

There are no clients currently running on the device.

Test Procedure
1. UE is powered on
2. Run the embedded RCS client on the device
3. Verify OPTIONs exchange is working
4. Test a successful chat to verify behaviour
5. Run the not embedded client on the device.

Expected behaviour
1. RCS services are available just after boot is completed and no RCS services are currently running
2. Configuration of embedded client takes place seamlessly to the user
3. Capability exchange is completed. User is able to access RCS services
4. RCS UX elements are enabled and the user can perform a successful chat
5. User gets notification that there is already another RCS client running on the device and propose
   user to change RCS client preferences to disable currently running embedded client.

55.1.5 RCS Service availability (switch of clients) when embedded client
   and not-embedded client are present in a device

Description
Verify the correct behaviour of the UE when two RCS clients are present in the device and the user
switches from embedded client to not-embedded client

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
This test shall verify that when the user can switch between the embedded client and not-embedded
client and the RCS service shall be available when switching to the non-embedded client.

Initial configuration
Network under test implements autoprovisioning and autoconfiguration process based on either:
- OMA-DM server based on the managed object configuration proposed in Annex A, section A.2; or
- OMA-CP server based on OMA-CP specific configuration proposed in Annex A, section A.2 and
  A.3; or
- HTTP Autoconfiguration Server described in section 2.2.2.1.2 of GSMA RCS specification and
  Annex A

Android joyn clients configured with gsma.joyn. meta-data properties according to the RCS
Implementation Guidelines.

RCS services have been previously configured successfully on the UE1/SIM CARD1 pair (User 1) for
running an embedded client. UE1 is powered off. The validity of the previous configuration is NOT
expired (expiration time is network dependent).

Test Procedure
1. UE1 is powered on
2. Run the not-embedded RCS client on a device
3. Change RCS client preferences to disable currently running embedded client
4. Run again the not-embedded RCS client on the device
5. Test a successful chat to verify behaviour
6. Run the embedded client on the device
7. Change RCS client preferences to disable currently running not-embedded client
8. After registration test a successful chat to verify behaviour

Expected behaviour
1. RCS services are available just after boot is completed and no RCS services are currently running
2. The not-embedded client shall inform to the user that there is another joyn client already
   configured in the device and that as a pre-requisite to use this one, it is necessary to disable the
   embedded client
3. Embedded client performs de-registration
4. Configuration of not-embedded client takes place seamlessly to the user. Capability exchange is
   completed. User is able to access RCS services
5. RCS UX elements are enabled and the user can perform a successful chat
6. The embedded client shall inform to the user that there is another joyn client already configured in the device and that as a pre-requisite to use this one, it is necessary to disable the not-embedded client.

7. Not-embedded client performs de-registration. Configuration of embedded client takes places seamlessly to the user. Capability exchange is completed. User is able to access RCS services.

8. RCS UX elements are enabled and the user can perform a successful chat.

55.2 User discovery

55.2.1 User discovery in address book: Adding a RCS contact when registered

Description
After adding a currently registered RCS user to the phonebook, it is included in the list of available users to initiate a chat.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a currently registered RCS user can discover other currently registered RCS users by adding them to the phonebook.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).

Both UEs are powered on.

Both UEs/clients are registered and the registration timer is far from expiration.

User 1 has not yet discovered User 2 as a valid RCS user.

Both User 1 and User 2 device camp in any radio network that allows at least IM.

Test Procedure
1. User 1 adds User 2 to his/her phonebook.
2. User 1 opens chat application to check the contacts from his/her phonebook that currently have access to RCS services.

Expected behaviour
1. A capability exchange is made with the new contact added to the phonebook.
2. After opening the chat application, the RCS user list is displayed, and User 2 is an available user to initiate a chat with.

55.2.2 User discovery in address book: Synchronizing contacts from an account (Internet account like Google, Facebook, Exchange)

Description
Synchronize contacts from an Internet account; and verify that currently registered RCS users among them are included in the list of available users to initiate a chat.

Note: Synchronizing contacts from an Internet account is outside the scope of RCS 1.2, so supporting this test is OPTIONAL. This test is applicable only if the device supports synchronizing contacts from an Internet account.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify that a currently registered RCS user can discover other currently registered RCS users by synchronizing contacts from an Internet account

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
UE 1 has at least one Internet Account (Google, Facebook, Exchange) configured
User 1 has User 2 as a contact on one of its Internet accounts (Google, Facebook, Exchange) not synchronized yet
User 1 has not yet discovered User 2 as a valid RCS user
Both UE1 and UE2 camp in any radio network that allows at least IM.

Test Procedure
1. User 1 selects several contacts from its Internet Account to be synchronised. User 2 is one of them
2. User 1 opens chat application to check the contacts from its phonebook that currently have access to RCS services.

Expected behaviour
1. A capability exchange is made with the new contacts added to the phonebook. The background activity does not affect UX
2. After opening the chat application, the RCS user list is displayed, and User 2 is an available user to initiate a chat with.

55.2.3 User discovery in address book: Discovery of RCS users via checking capabilities

Description
Select from the phonebook a currently registered RCS user that was not discovered as a RCS user previously, and verify it is included in the list of available users to initiate a chat

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a currently registered RCS user can discover other currently registered RCS users by selecting them from the phonebook

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
User 2 MSISDN is already in UE1 phonebook; however, User 2 is not yet in UE1’s list of known RCS users (i.e. it was powered off when UE1 performed first and following capability discoveries, or it has been recently provisioned in the RCS service).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UE1 and UE2 camp in any radio network that allows at least IM

Test Procedure
1. User 1 selects User 2 from UE1’s phonebook. User 2 was not in the list of known RCS users.
2. User 1 opens chat application to check the contacts from its phonebook that currently have access to RCS services.

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from the phonebook.
2. After opening the chat application, the RCS user list is displayed, and User 2 is an available user to initiate a chat with.

55.2.4 Passive discovery of currently registered RCS users

Description
Verify that capability discovery mechanism initiated when adding a new user to the phonebook can be a valid mechanism for the remote user to discover RCS users in a passive way, so the remote user can now find it on their lists of available users to initiate a chat.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a currently registered RCS user can discover other currently registered RCS users in a passive way

Initial configuration
RCS services have been previously configured successfully both on UE1/SIMCARD 1 (User 1) and UE2/SIM CARD2 pair (User 2)
UE1 is powered on, UE2 is powered off.
User 1 has not yet User 2 MSISDN on UE1’s phonebook. User 2 has not yet User 1 MSISDN on UE2’s phonebook.
Client 1 is registered and the registration timer is far from expiration.
Both UEs/clients are registered and the registration timer is far from expiration.
Both UE1 and UE2 camp in any radio network that allows at least IM.

Test Procedure
1. User 1 adds User 2 MSISDN on UE1’s phonebook.
2. User 1 opens UE1’s chat application to check the contacts from its phonebook that have currently access to RCS services.
3. UE2 is powered on.
4. User 2 adds User 1 MSISDN on UE2’s phonebook.
5. User 1 opens UE1’s chat application to check the contacts from its phonebook that have currently access to RCS services.

Expected behaviour
1. A capability exchange is made with the new contact added to the phonebook.
2. After User 1 opens the chat application, the RCS user list is displayed on UE1. User 2 is not yet a valid user to initiate a chat with.
3. –
4. A capability exchange is made with the new contact added to the phonebook.
5. After User 1 opens the chat application, the RCS user list is displayed on UE1. User 2 is already a valid user to initiate a chat with.
55.3 Capability exchange

55.3.1 Successful capability query after a registration during a call

Description
A voice call is established between two currently registered RCS users, but one of the UEs is out of data coverage. Verify that In-Call RCS services are shortly restored as soon as the UE has data coverage again.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that when a voice call is established between two currently registered RCS users, in-call RCS capabilities fluctuate depending on radio coverage.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration.
UE1 camp in any radio network that allows both Video Share and Image Share.
UE2 has no data connection active.

Test Procedure
1. A voice call is established between both devices.
2. UE 2 recovers data coverage under 3G/HSPA or Wi-Fi.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are not able to see each other's supported RCS capabilities.
2. UE2 registers back and initiates a capability exchange, and both users are able to see each other's supported capabilities, e.g. image share AND video share.

55.3.2 Successful capability query when a voice call returns to active after hold

Description
A voice call is performed between two currently registered RCS users. Verify in-call RCS services are recovered after Call Hold is retrieved.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that when a voice call has been on Hold and retrieved that in-call RCS capabilities are recovered again.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration.
Both UE1 and UE2 camp in any radio network that allows both VideoShare and ImageShare.
There is an on-going call between User 1 and User 2 which is on Hold; so video share and image share capabilities are not available.

**Test Procedure**
User 1 retrieves the call.

**Expected behaviour**
Exchange of capabilities takes place just after the call is retrieved, and both users are able to see again each other’s supported capabilities, e.g. video share, image share.

### 55.3.3 Capability Query: RCS user offline ungraceful/online

**Description**
This test verifies the online/offline notifications in 2 different parts of the UE, Phonebook & Chat application, when a RCS user is going offline in ungracefully manner.

**Related core specifications**
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**
Verify that a currently register ed RCS user can identify if other RCS users are online/offline and discover current capabilities by selecting them either from the phonebook or chat application.

**Initial configuration**
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both User 1 and User 2 device camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM).
User 2 entry is stored in UE’s 1 phonebook, UE1 has already identified User 2 as an online RCS user

**Test Procedure**

**Scenario A:**
1. User 2 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi on UE2).
2. User 1 selects User 2 from UE1’s phonebook.
3. Force UE2’s RCS client to register (e.g. powering on UE2, inserting again SIM card or by recover coverage on UE2)
4. User 1 selects User 2 from UE1’s phonebook.

**Scenario B:**
1. User 2 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi on UE2).
2. User 1 selects User 2 from UE1’s chat application.
3. Force UE2’s RCS client to register (e.g. powering on UE2, inserting again SIM card or by recover coverage on UE2).
4. User 1 selects User 2 from UE1’s chat application.

**Expected behaviour**
1. –
2. A capability exchange is made when User 1 selects User 2 on UE1’s phonebook or chat application (depends on scenario A or B). UE1/client 1 shows RCS services for User 2 are not
currently available (greyed out). Only IM will be shown as available if test network implements Store&Forward.

3. –

4. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook or chat application (depends on scenario A or B). UE1/client 1 shows User 2 has both IM and File Transfer available as RCS services.

55.3.4 Capability query in 1-2-1 chat (file transfer no longer available)

Description
Select from the first UE’s phonebook a currently registered RCS user. Try to establish an IM session. Verify that when one device performs a Handover that certain RCS services might become non-accessible/available. For e.g. FT might not be available under 2G coverage.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a Handover might make certain RCS service, for e.g. File Transfer impossible to use while an Instant Messaging session is on-going.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).

Both UEs are powered on.

Both UEs/clients are online: registered and the registration timer is far from expiration.

Both, UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM)

User 2 is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.

   Note: File Transfer support under 2G/EDGE is an OPTIONAL feature (MNO network dependant). If 2G/EDGE network has implemented FT in the network, then this test is not applicable.

Test Procedure
1. User 1 sends chat invitation to User 2.
2. User 2 selects the message from the notification bar.
3. User 2 answers while User 1 has the chat window still open.
4. Once the chat session is established between User 1 and User 2, User 2 moves from a 3G cell to a 2G cell without IP reconfiguration involved.
5. User 1 sends an IM message to User 2.
6. User 2 moves back from a 2G cell into 3G cell without IP reconfiguration involved.

Expected behaviour
1. User 1 sees the message has been “Sent” but not yet delivered. User 1 checks available RCS services, at least IM and FT should be available. User 2 sees message from User 1 in UE2’s notification bar. User 1 sees the message “Delivered” notification.
2. UE2’s chat window is opened. User 1 sees the message “Displayed” notification.
3. User 2 sees the message has been “Sent” but not yet delivered. User 1 sees message from User 1 in UE1’s chat window. User 1 sees the message “Delivered” and “Displayed” notification.
4. A capability exchange is made when User 2 moves to a 2G cell. UE 1’s chat window shows File Transfer with User 2 is not available anymore (FT service icon greyed out). Also UE 2’s chat window shows File Transfer with User 1 is not available anymore (FT service icon greyed out).
5. User 2 receives the message.
6. A capability exchange is made when User 2 moves to a 3G cell. UE1’s chat window shows File Transfer with User 2 is now available (FT service icon not greyed out). Also UE2’s chat window shows File Transfer with User 1 is now available (FT service icon not greyed out).

55.3.5 Capability query in chat application: RCS user offline/online graceful

Description
Select from the chat application a currently unregistered RCS user that was previously discovered as a registered RCS user, and verify it is shown as offline. Bring the unregistered back online and select it again from the chat application to verify it is shown as online.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a currently registered RCS user can identify if other RCS users are online/offline by selecting them from the chat application.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.
Both UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM).

Test Procedure
1. Power off UE2
2. User 1 enters UE1’s chat application to see the list of RCS contacts to start a chat
3. User 1 selects a contact with both File Transfer and IM services displayed as available -User 2-, and waits for capability exchange.
4. Power on UE2, User1 leaves chat application
5. User 1 enters the chat application to see the list of RCS contacts to start a chat
6. User 1 selects a contact with at least File Transfer service displayed as currently not available (greyed out) -User 2-, and waits for capability exchange.

Expected behaviour
1. –
2. –
3. Capabilities are exchanged to understand if a chat can start with user 2. As a result, UE1 shows RCS services for that contact are not currently available (greyed out). Only IM will be shown as available if test network implements Store&Forward.
4. –
5. –
6. Capabilities are exchanged to understand if a chat can start with user 2. As a result, UE 1 shows both IM and File Transfer as available RCS services for User 2.
55.4 File Transfer

55.4.1 File Transfer without Auto Accept

55.4.1.1 Successful File Transfer from Phonebook (one-to-one)

Description
Select from the UE’s phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and verify it is possible to complete a one-to-one file transfer. The file to be sent is obtained from external memory/SD, in case external memory is supported by the device, otherwise the file should be stored and obtained from the device memory.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify possibility to perform successful file transfer from UE’s phonebook (one-to-one).

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).

Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 under WiFi coverage, UE2 under EDGE/3G/HSPA coverage
Both UE1 and UE2 have enough free storage space to receive file/s and enough battery
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or UE1’s RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1 phonebook
2. User 1 selects file transfer option
3. User 1 selects a file via File Manager from the external memory, if applicable otherwise from the device memory and selects share option
4. User 2 selects the file transfer notification from the notification bar
5. User 2 accepts the invitation
6. Both users wait for File transfer to be completed.
7. User 2 opens the file

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 displays File Transfer request notification from User 1 in the notification bar.
4. UE2 chat application is invoked. Chat window shows the invitation stating the file type and the size; if it is a supported file type, User 2 should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
5. User 1 can check the progress in the notification bar (the transfer does not block the UI).
6. User 2 receives file. User 1 receives a confirmation that the file transfer is completed.
7. User 2 can open the file properly
55.4.1.2 Successful file transfer from File Transfer/gallery app (one-to-many)

Description
Select from the gallery a file; and verify it is possible to transfer it to several currently registered RCS users that were previously discovered as registered RCS users.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify possibility to perform successful file transfers from gallery (one-to-many).

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2), UE3/SIM CARD3 pair (User 3) and UE4/SIM CARD4 pair (User 4).

All UEs are powered on.

All UEs/clients are online: registered and the registration timer is far from expiration

All UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 under WiFi coverage, UE2, UE3 and UE4 under EDGE/3G/HSPA coverage

All UEs have enough free storage space to receive file/s and enough battery

User 2, User 3 and User 4 entries are already stored in UE1’s phonebook, UE1 has already identified User 2, User 3 and User 4 as online RCS users

Either UE1 has a native file manager, or UE1’s RCS client has a built-in file manager

Test Procedure
1. User 1 browses his/her files.
2. User 1 selects a file via File Manager
3. User 1 selects file transfer option
4. User 1 selects three contacts from his/her RCS contacts list and presses file sharing option
5. Users 2, 3 and 4 select the file transfer notification from the notification bar
6. Users 2, 3 and 4 accept the invitation and start transfer
7. All users wait for File transfer to be completed.
8. Users 2, 3 and 4 open the file

Expected behaviour
1. –
2. –
3. –
4. UE2, UE3 and UE4 display File Transfer request notification from User 1 in the notification bar.
5. UE2, UE 3 and UE4 chat applications are invoked. Chat windows show the invitation stating the file type and the size; if it is a supported file type, all of them should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
6. User 1 can check the progress in the notification bar (the transfer does not block the UI).
7. Users 2, 3 and 4 receive the file. User 1 receives a confirmation that the file transfer is completed.
8. Users 2, 3 and 4 can open the file properly
55.4.1.3 Successful multiple file transfer from File Transfer/gallery app (one-to-many)

Description
Select from the gallery three files; and verify it is possible to transfer them to several currently registered RCS users that were previously discovered as registered RCS users.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify possibility to perform successful file transfer from gallery (one-to-many).

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2), UE3/SIM CARD3 pair (User 3) and UE4/SIM CARD4 pair (User 4).
All UEs are powered on.
All UEs/clients are online: registered and the registration timer is far from expiration
All UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2, UE3 and UE4 on EDGE/3G/HSPA coverage
All UEs have enough free storage space to receive file/s and enough battery
User 2, User 3 and User 4 entries are already stored in UE1’s phonebook, UE1 has already identified User 2, User 3 and User 4 as online RCS users
Either UE1 has a native file manager, or the UE1’s RCS client has a built-in file manager

Test Procedure
1. User 1 browses his/her files.
2. User 1 selects three files via File Manager
3. User 1 selects file transfer option
4. User 1 selects three contacts from his/her RCS contacts list and press file sharing option
5. Users 2, 3 and 4 select the file transfer notifications from their own UE’s notification bar
6. Users 2, 3 and 4 accept the invitations and start the transfer
7. All users wait for File transfer to be completed.
8. Users 2, 3 and 4 open the file

Expected behaviour
1. –
2. –
3. –
For each file, the following steps can be verified:
4. UE2, UE3 and UE4 display File Transfer request notifications from User 1 in the notification bar.
5. UE2, UE 3 and UE4 chat applications are invoked. Chat windows show the invitation stating the file type and the size; if it is a supported file type, all of them should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
6. User 1 can check the progress in the notification bar (the transfer does not block the UI).
7. Users 2, 3 and 4 receive the files. User 1 receives a confirmation that the file transfer is completed.
8. Users 2, 3 and 4 can open the files properly
55.4.1.4 Successful File Transfer from Chat Application (one-to-one) and IM/Chat Session.

Description
Select from chat application a currently registered RCS user that was previously discovered as a registered RCS user, verify it is possible to complete a one-to-one file transfer - the file to be sent is obtained from external memory/SD, in case external memory is supported by the device, otherwise the file should be stored and obtained from the device memory. And verify the target user can start a chat/IM session afterwards.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify possibility to perform simultaneous transfer from chat application (one-to-one).

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2 on EDGE/3G/HSPA coverage.
Both UEs have enough free storage space to receive file/s and enough battery.
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.
Either UE1 has a native file manager, or its RCS client has a built-in file manager.

Test Procedure
1. User 1 enters UE1’s chat application to see the list of RCS contacts available.
2. User 1 selects a contact which is initially displayed as online (User 2), and waits for capability exchange.
3. User 1 selects file transfer option.
4. User 1 selects one file via File Manager, and selects share option.
5. User 2 selects the file transfer notification from the notification bar.
6. User 2 accepts the invitation.
7. Both users wait for File transfer to be completed.
8. User 2 opens the file.
9. User 2 sends IM/Chat invitation to User 1 by typing some text and selects send option.

Expected behaviour
1. –
2. A capability exchange is made when User 1 selects User 2 from UE1 chat application.
3. –
4. UE2 displays File Transfer request notification from User 1 in the notification bar.
5. UE2’s chat window shows the invitation stating the file type and the size; if it is a supported file type, user 2 should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
6. User 1 can check the progress in the notification bar (the transfer does not block the UI).
7. User 2 receives file. User 1 receives a confirmation that the file transfer is completed.
8. User 2 can open the file properly
9. User 1 receives IM/Chat invitation

55.4.1.5 One-to-one File Transfer - rejected by the destination

Description
Select from the phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and request a one-to-one file transfer. Verify the target user can reject it. The file to be sent is obtained from external memory/SD, in case external memory is supported by the device, otherwise the file should be stored and obtained from the device memory.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the target user of a file transfer can reject it.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2 on EDGE/3G/HSPA coverage
Both UEs have enough free storage space to receive file/s and enough battery
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or its RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects file transfer option
3. User 1 selects a file via File Manager from the external memory list and selects share option
4. User 2 selects the file transfer notification from the notification bar
5. User 2 rejects the invitation

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 displays File Transfer request notification from User 1 in the notification bar.
4. UE2 chat application is invoked. Chat window shows the invitation stating the file type and the size; if it is a supported file type, user 2 should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
5. UE1 displays a notification, explaining User 2 rejected the file transfer.

55.4.1.6 Multiple one-to-one File Transfer cancelled by the sender

Description
Select from the phonebook a currently registered RCS user and request a multiple file transfer. Verify the sender can cancel file transfers while the third file is being transferred. The files to be sent are obtained from the external memory/SD, in case external memory is supported by the device, otherwise the file should be stored and obtained from the device memory.
Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the sender of multiple file transfers can cancel it after destination accepts the invitation, even if the transfer of the first files were completed.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2 on EDGE/3G/HSPA coverage
Both UEs have enough free storage space to receive file/s and enough battery
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or the RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects file transfer option
3. User 1 selects via File Manager two files from the internal memory, and two files from the external memory, and selects the share option
4. User 2 selects the file transfer notifications from UE2’s notification bar
5. User 2 accepts the invitations and start the transfers
6. User 1 waits for the completion of the first two files transfers
7. User 1 cancels file transfer while third file is being transferred
8. If the transfer of the 4th file is not affected, User 1 waits for completion of the fourth file transfer.

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE2’s phonebook.
2. –
3. UE2 displays File Transfer request notifications from User 1 in the notification bar.
4. UE2 chat application is invoked. Chat window shows the invitations stating the file type and the size; if it is a supported file type, User 2 should visualize the relevant MIME icon or a mini-preview should be displayed within the chat window (all File Transfers take place on a chat window).
5. Both users can check the progress in the notification bar (the transfer does not block the UI).
6. User 2 receives the first and second file
7. User 2 receives a notification reporting User 1 cancelled the file transfer of third file
8. User 2 can open the received files properly (1st, 2nd and 4th if transferred)

55.4.1.7 Multiple one-to-one file transfer cancelled by the destination

Description
Select from the phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and request a multiple file transfer. Verify the target user can cancel file transfers while the third file is being transferred. The files to be sent are obtained from the external memory/SD, in case external memory is supported by the device, otherwise the file should be stored and obtained from the device memory.
Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the target user of a multiple file transfer can cancel it after accepting the invitation, even if the transfer of the first files were completed.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2 on EDGE/3G/HSPA coverage
Both UEs have enough free storage space to receive file/s and enough battery
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or its RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects file transfer option
3. User 1 selects via File Manager two files from the internal memory, and two files from the external memory, and select the share option
4. User 2 selects the file transfer notifications from the notification bar
5. User 2 accepts the invitations
6. User 2 waits for the completion of the first two files transfers
7. User 2 cancels file transfer while third file is being transferred
8. User 2 waits for completion of the fourth file transfer.

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 displays File Transfer request notification from User 1 in the notification bar.
4. UE2 chat application is invoked. Chat window shows the invitations stating the file type and the size; if it is a supported file type, user 2 should visualize the relevant MIME icon or mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
5. User 1 can check the progress in the notification bar (the transfer does not block the UI).
6. User 2 receives the first and second file
7. UE1 displays a notification, User 2 cancelled file transfer of third file
8. User 2 can open the received files properly (1st, 2nd and 4th)

55.4.1.8 Unsuccessful transfer: Receiver does not answer

Description
Select from the phonebook a currently registered RCS user and request a one-to-one file transfer. Verify that if the target user does not accept the invitation, a transfer invitation timeout expires and sender is reported.
Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that if the target user of a file transfer ignores the invitation, a timeout applies and the transfer is not completed.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 in WiFi coverage, UE2 on EDGE/3G/HSPA coverage
Both UEs have enough free storage space to receive file/s and enough battery
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or its RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects the file transfer option
3. User 1 selects a file and selects the share option
4. User 2 selects the file transfer notification from the notification bar
5. User 2 ignores invitation

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 displays File Transfer request notification from User 1 in the notification bar.
4. UE2 chat application is invoked. Chat window shows the invitation stating the file type and the size; if it is a supported file type, user 2 should visualize the relevant MIME icon or a mini-preview should be displayed within the chat window (all File Transfer take place on a chat window).
5. After timeout applies, UE1 shows a notification, explaining invitation expired.

55.4.1.9 File size warning limit (sender + receiver)

Description
Select from the phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and request a one-to-one file transfer. Both UEs shall warn the user because the file size exceeds the network recommendation.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify both UEs warn users when file transfer size exceeds the limit imposed by the network operator via autoconfiguration

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM)
Both UEs have enough free storage space to receive file/s and enough battery
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or the RCS client has a built-in file manager
File size warning limit is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.

Test Procedure
1. User 1 selects a contact from UE1’s phonebook (User 2)
2. User 1 selects file transfer option
3. User 1 selects via File Manager a file larger than the warning file size (optional part of the autoconfiguration parameters downloaded)
4. User 1 confirms and proceeds
5. User 2 selects the file transfer notification from the notification bar

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1 phonebook.
2. –
3. User 1 gets a warning message; and confirmation is asked to proceed
4. UE2 displays File Transfer request notification from User 1 in the notification bar.
5. User 2 receives the invitation with a warning message as part of the invitation message; and confirmation is asked to proceed

55.4.1.10 File size limit (sender)

Description
Select from the phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and request a one-to-one file transfer. The sender RCS client shall not progress the invitation because the file size exceeds the sender’s limit.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the sender RCS client does not allow file transfer when the size exceeds the limit imposed by the network operator via autoconfiguration

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM)
Both UEs have enough free storage space to receive file/s and enough battery
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or its RCS client has a built-in file manager

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects file transfer option
3. User 1 selects via File Manager a file larger than the maximum file size (part of the autoconfiguration parameters downloaded)

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE1 displays a file size limit message; and prompts to choose another file. User 2 is not invited yet to file transference.

55.4.2 File Transfer with Auto Accept

NOTE: These test cases depend upon the support of File Transfer Auto Accept feature by the network and device.

55.4.2.1 Successful Auto Accept of the File Transfer Session

Description
Select from the UE’s phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and verify it is possible to complete a one-to-one file transfer when the auto accept switch is active on the receiver’s File Transfer settings menu.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify possibility to perform successful file transfer from UE’s phonebook (one-to-one) without user manual acceptance or confirmation.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
Both UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 under WiFi coverage, UE2 under EDGE/3G/HSPA coverage.
Both UE1 and UE2 have enough free storage space to receive file/s and enough battery.
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.
Either UE1 has a native file manager, or UE1’s RCS client has a built-in file manager.
Auto Accept switch in settings menu for File transfer on UE2 is Activated. (DUT = UE2/User 2).

Test Procedure
1. User 1 selects a contact (User 2) from UE1 phonebook
2. User 1 selects file transfer option
3. User 1 selects a file via File Manager and selects share option
4. Both users wait for File transfer to be completed.
5. User 2 opens the file

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 chat application is invoked. User 1 and User 2 can check the progress in the notification bar.
   (the transfer does not block the UI).
4. User 2 receives file. User 1 receives a confirmation that the file transfer is completed.
5. User 2 can open the file properly.

55.4.2.2 File Size Warning Limit (sender + receiver)

Description
Select from the phonebook a currently registered RCS user that was previously discovered as a registered RCS user, and request a one-to-one file transfer when the Auto Accept switch is active on the receiver’s File Transfer settings menu. Receiver auto accepts the file transfer however both UEs shall warn the user because the file size exceeds the network recommendation. File transfer proceeds after the receiver confirms to warning message.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify both UEs warn users when file transfer size exceeds the limit imposed by the network operator via autoconfiguration.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM)
Both UEs have enough free storage space to receive file/s and enough battery.
User 2 entry is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.
Either UE1 has a native file manager, or the RCS client has a built-in file manager.
File size warning limit is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.
Auto Accept switch in settings menu for File transfer on UE2 is Activated. (DUT = UE2/User 2).

Test Procedure
1. User 1 selects a contact from UE1’s phonebook (User 2).
2. User 1 selects file transfer option.
3. User 1 selects via File Manager a file larger than the warning file size (optional part of the autoconfiguration parameters downloaded)
4. User 1 confirms and proceeds.
5. Both users wait for File transfer to be completed.
6. User 2 opens the file.

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1 phonebook.
2. –
3. User 1 gets a warning message; and confirmation is asked to proceed.
4. UE2 displays a warning message in the notification bar. After User 2 accepts the warning message, User 1 and User 2 can check the progress in the notification bar (the transfer does not block the UI).
5. User 2 receives file. After the transfer is made, User 1 receives a confirmation that the file transfer has been completed.

6. User 2 can open the file properly.

55.4.2.3 No Auto Accept option to user (receiver)

Description
Select from the UE’s phonebook a currently registered RCS user that was previously discovered as a registered RCS user. And the purpose of the test is to verify that INVITE for file transfer cannot be answered automatically by the receiver. The receiver tries to change file transfer settings to Auto Accept but his/her device doesn’t show any selectable option for auto-accept.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that when MNO has configured not to allow Auto Accept, receiver user does not get option to activate Auto Accept.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration
Both UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM); UE1 under WiFi coverage, UE2 under EDGE/3G/HSPA coverage
Both UE1 and UE2 have enough free storage space to receive file/s and enough battery
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user
Either UE1 has a native file manager, or UE1’s RCS client has a built-in file manager
Auto Accept is configured to be de-activated by the MNO.

Test Procedure
1. User 1 selects a contact (User 2) from UE1 phonebook
2. User 1 selects file transfer option
3. User 1 selects a file via File Manager and selects share option
4. User 2 opens the settings for File Transfer in order to change the file transfer settings to Auto Accept mode

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. UE2 displays File Transfer request notification from User 1 in the notification bar.
4. There is no option to update File Transfer settings to Auto Accept of files on UE2

55.5 RCS in-call services

55.5.1 Basic sharing: call termination (image share)

Description
A voice call is established between two currently registered RCS users; also a simultaneous image share session. The call is released. Verify Image Share session ends also, no matter the image was already transferred and is still being displayed, or it is being transferred.
Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that voice call release will also release any active image share session, no matter if the image was already transferred and is still being displayed, or when it is being transferred.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both Video Share and Image Share.
DUT is UE2.

Test Procedure
1. A voice call is established between both UEs.
2. User 1 (calling party) invites User 2 to an image share session.
3. User 2 accepts.
4. User 1, who is still sharing an image with user 2 (the image had been already transferred and is still being displayed), ends the voice call.
5. A voice call is again established between both devices.
6. User 2 (called party) invites User 1 to an image share session.
7. User 1 accepts.
8. User 2 is sharing an image with user 1 (still transferring), when User 2 decides to end the voice call.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives the invitation
3. Image sharing starts and the image is successfully transferred. Image is displayed on UE2
4. Image sharing ends (UE2 stops displaying image) when the call is released.
5. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
6. User 1 receives the invitation
7. Image sharing starts, the image is still being transferred.
8. The image share is aborted (transfer cancelled) and call is released.

55.5.2 Basic sharing: call termination (video share)

Description
A voice call is established between two currently registered RCS users; also a simultaneous video share session. The call is released. Verify Video Share session ends also.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that voice call release will also release any active video share session.
Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both Video Share and Image Share.
DUT is UE2.

Test Procedure
1. A voice call is established between both devices.
2. User 1 (calling party) invites User 2 to a video share session.
3. User 2 accepts.
4. User 1 is still currently sharing a video with user 2 when user 2 releases the voice call.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives the invitation
3. Video sharing starts. Video is displayed on UE2
4. The video share is terminated (video no longer displayed on UE2)

55.5.3 Video share: sending video – caller

Description
A voice call is established between two currently registered RCS users. Under the appropriate conditions, the calling party can start a video share session.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that caller party can initiate a video share

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both Video Share and Image Share
DUT is UE2/User2.

Test Procedure
1. A voice call is established between both devices.
2. User 1 (caller) invites User 2 to a video share session.
3. User 2 accepts.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives the invitation
3. Video sharing starts. Video is displayed on UE2

55.5.4  Video share: sending video – receiver

Description
A voice call is established between two currently registered RCS users. Under the appropriate conditions, the called party can start a video share session.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that called party can initiate a video share

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both Video Share and Image Share
DUT is UE2/User2.

Test Procedure
1. A voice call is established between both devices.
2. User 1 (called) invites User 2 to a video share session.
3. User 2 accepts.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives the invitation
3. Video sharing starts. Video is displayed on UE2

55.5.5  Video share: invite cancellation

Description
A voice call is established between two currently registered RCS users; a simultaneous video share session is initiated. Verify Video Share session can be cancelled.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the caller party can send a cancellation response for a video share session.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UEs are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows VideoShare

Test Procedure
1. User 1 and user 2 are in an active voice call
2. User 1 sends video share invite to user 2
3. Before User 2 accepts the invitation, User 1 decides to cancel the video share invite.

**Expected behaviour**

1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 gets a video share invitation
3. User 2 gets a notification that the video share invite has been cancelled and the call remains without video share.

**55.5.6 Video share: User 2 does not answer**

**Description**

A voice call is established between two currently registered RCS users; a simultaneous video share session is initiated. Verify Video Share session can be cancelled due to timeout or no answer from called party

**Related core specifications**

GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**

Verify that a video share session is cancelled in case of timeout or no answer from the target user

**Initial configuration**

RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).

Both UE are powered on.

Both UE/SIM card are registered and the registration timer is far from expiration

Both User 1 and User 2 UE camp in any radio network that allows both VideoShare and ImageShare.

**Test Procedure**

1. User 1 and user 2 are in an active voice call
2. User 1 invites User 2 to receive a video session
3. User 2 stays passive after receiving invite for video share from User 1. User 2 does NOT answer

**Expected behaviour**

1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives a video share invitation
3. After Timeout, UE 1 initiates a capability exchange to verify User 2 status and User 1 receives a message indicating “No answer” or similar after answer timeout expires. Video sharing doesn’t start and the voice call continues.

**55.5.7 Video share: cancel – sender**

**Description**

A voice call is established between two currently registered RCS users. Under the appropriate conditions, the called party can start a video share session.

**Related core specifications**

GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**

Verify the caller party can cancel a video share session.
Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card pair (User 1) and UE2/SIM card pair (User 2).

Both UE are powered on.

Both UE/SIM card are registered and the registration timer is far from expiration

Both User 1 and User 2 UE camp in any radio network that allows VideoShare

Test Procedure
1. User 1 and User 2 are in an active voice call
2. There is an active video share session from User 1 to User 2
3. User 1 cancels video share while sharing.

Expected behaviour
1. Both users are in an active Voice Call
2. User 2 can see the Video Share
3. a. User 2 gets notification that the video share has been cancelled/terminated.
   b. UE 2 initiates a capability exchange to verify status of User 1
   c. The Voice call remains

55.5.8 Video share: cancel – receiver

Description
A voice call is established between two currently registered RCS users. Under the appropriate conditions, the called party can cancel a video share session.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the called party can cancel a video share session.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card pair (User 1) and UE2/SIM card pair (User 2).

Both UE are powered on.

Both UE/SIM card are registered and the registration timer is far from expiration

Both User 1 and User 2 UE camp in any radio network that allows VideoShare

Test Procedure
1. User 1 and user 2 are in an active voice call
2. There is an active video share session from user 1 to user 2
3. User 2 under test cancels video share while sharing.

Expected behaviour
1. Both users are in an active Voice Call
2. User 2 can see the Video Share
3. a. User 1 gets notification that the video share has been cancelled/terminated.
   b. UE 1 initiates a capability exchange to verify status of User 2
   c. The Voice call remains
55.5.9 Video share: non-graceful termination – sender

Description
A voice call is established between two currently registered RCS users; a simultaneous video share session is initiated. Verify Video Share session termination in case of ungraceful termination of sender.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify termination of video share session when User 1 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows VideoShare

Test Procedure
1. User 1 and user 2 are in an active voice call
2. There is an active video share session from User 1 to User 2
3. User 1 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi)

Expected behaviour
1. Both users are in an active Voice Call
2. User 2 can see the Video Share
3. The video share is terminated on both ends and after UE 2 performs a capability exchange to verify the new status the video share capability is shown as unavailable.

55.5.10 Video share: non-graceful termination – receiver

Description
A voice call is established between two currently registered RCS users; a simultaneous video share session is initiated. Verify Video Share session termination in case of ungraceful termination of receiver.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify termination of video share session when User 2 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows VideoShare.
Test Procedure

1. User 2 under test. User 1 and 2 are in an active voice call. There is an active video share session from User 1 to User 2.

2. User 2 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi).

Expected behaviour

1. Both users are in an active Voice Call

2. User 2 can see the Video Share. The video share is terminated on both ends and after UE 1 performs a capability exchange to verify the new status the video share capability is shown as unavailable.

55.5.11 Call on Hold. Retrieve call on Hold + restart Video Sharing

Description

A voice call is established between two currently registered RCS users. If a Video Share session is also established and any of the users puts the call on hold, the video share session will automatically end. After call retrieval, the called party can start again a video share session.

Related core specifications

GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test

Verify that a call hold will finish any active video share session. Verify when a held call is retrieved, it is again possible to establish a video share session.

Initial configuration

RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).

Both UEs are powered on.

Both UEs/clients are registered and the registration timer is far from expiration.

Both UEs camp in any radio network that allows both Video Share and Image Share.

Test Procedure

1. A voice call is established between both devices.

2. User 1 (called) invites User 2 to a live video share session.

3. User 2 accepts.

4. User 2 puts call with User 1 on hold.

5. User 2 retrieves call with User 1.

6. User 1 invites User 2 to a stored video share session.

7. User 2 accepts.

Expected behaviour

1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.

2. User 2 receives the invitation.

3. Video share starts. Video is displayed on UE2.

4. Video share between Users A and B ends (video no longer displayed on UE2); RCS capabilities are updated for both users: image and video share services are no longer available.

5. RCS capabilities are updated for both users: image share and video share services are again available.

6. User 2 receives the invitation.
7. Video share starts. Video is displayed on UE2

55.5.12 Share an image. A picture taken using the front camera (“me”)

Description
A voice call is established between two currently registered RCS users. Under the appropriate conditions, the calling party starts an image share, taking a live picture from its front camera (“me”).

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that caller party can initiate an image share, taking a live picture from its front camera (“me”)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.

Test Procedure
1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to an image share session.
3. User 1 invites user 2 to receive a Picture, taken on the fly from its front camera
4. User 2 accepts

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 receives the invitation
3. Image sharing starts and get successfully transferred
4. The image is displayed on User 2’s UE

55.5.13 Share a picture. A picture taken using the rear camera (“what I see”)

Description
A voice call is established between two currently registered RCS users. Under the appropriate conditions, the calling party starts an image share, taking a live picture from its rear camera (“what I see”)

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that caller party can initiate an image share, taking a live picture from its rear camera (“what I see”)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration
Both UEs camp in any radio network that allows both Video Share and Image Share.
Test Procedure
1. A voice call is established between both devices.
2. User 1 (calling party) invites user 2 to an image share session, taken on the fly from its rear camera
3. User 2 accepts

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. video share, image share.
2. User 2 receives the invitation
3. Image sharing starts, the image gets successfully transferred. The image is displayed on UE2

55.5.14 Share an image. A file (“send stored image”)

Description
A voice call is established between two currently registered RCS users and simultaneous a stored image share is initiated.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that caller party can initiate an image share from a stored file.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a picture, stored file
3. User 2 accepts the invitation

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive an image from User 1
3. The image is transferred to User 2 and successfully displayed on User 2’s UE.

55.5.15 Share a stored image. User 2 rejects

Description
A voice call is established between two currently registered RCS users. User 1 requests a share a stored image. Verify that User 2 can reject the image share.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify the target user of an image share can reject it.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 2 under test
2. User 1 and 2 are in an active voice call
3. User 1 invites User 2 to receive a stored image
4. User 2 rejects the image share invitation.

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other's supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive an image from User 1
3. The image sharing doesn't start on UE 2 and User 1 receives an error message, explaining User 2 rejected the Image share.

55.5.16 Share an image. Non graceful termination

Description
A voice call is established between two currently registered RCS users and simultaneous a stored image share is initiated. Verify the image share termination in case of ungraceful termination of sender by taking the battery out.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify termination of stored image share session when User 1 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a stored image.
3. User 2 accepts the invitation
4. User 1 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi).

5. User 2 under test

**Expected behaviour**

1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive an image from User 1
3. Image transfer starts from User 1 to User 2
4. The image sharing ends when User 1 loses the coverage
5. User 2 sees that User 1’s image share capability is shown unavailable.

55.5.17 Share an image. User 2 does not answer

**Description**

A voice call is established between two currently registered RCS users; a simultaneous image share session is initiated. Verify the image share cancellation in case user 2 does not answer the image share invitation.

**Related core specifications**

GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**

Verify the target user of an image share will not receive it since he didn’t accept invitation.

**Initial configuration**

RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).

Both UE are powered on.

Both UE/SIM card are registered and the registration timer is far from expiration

Both User 1 and User 2 UE camp in any radio network that allows ImageShare.

User 1 has a previously made image on his internal or external memory.

**Test Procedure**

1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a stored picture
3. User 2 does NOT answer

**Expected behaviour**

1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive a stored image from User 1
3. User 1 receives a message indicating “No answer” or similar after the answer timeout expired.

55.5.18 Share an image. User 1 cancels invitation after sending

**Description**

A voice call is established between two currently registered RCS users; a simultaneous image share session is initiated. Verify user 1 capabilities to cancel the image share session.

**Related core specifications**

GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify the caller party can cancel an image share session before receiving the acceptance of invitation from receiver.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a stored picture
3. User 1 sends cancellation before User 2 accepts

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive a stored image from User 1
3. User 2 receives cancellation notification

55.5.19 Share a picture. User 1 cancels invitation while sharing (file transfer in place)

Description
A voice call is established between two currently registered RCS users; a simultaneous image share session is initiated. Verify user 1 capabilities to cancel the image share session during the file transfer.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the caller party can cancel an image share session while the file transfer starts.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).
Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a stored picture
3. User 2 accepts invitation
4. User 1 send cancellation while sharing
Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive a stored image from User 1
3. The image sharing transfer is started
4. The image sharing ends and User 2 receives cancellation notification

55.5.20 Share a picture. User 2 cancels invitation while sharing (file transfer in place)

Description
A voice call is established between two currently registered RCS users; a simultaneous image share session is initiated. Verify user 2 capabilities to cancel the image share session while file transfer is completed.

Related core specifications
GSMA RCS – Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the target user can cancel an image share session while the file transfer is in place

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM card1 pair (User 1) and UE2/SIM card2 pair (User 2).

Both UE are powered on.
Both UE/SIM card are registered and the registration timer is far from expiration
Both User 1 and User 2 UE camp in any radio network that allows ImageShare.
User 1 has a previously made image on his internal or external memory.

Test Procedure
1. User 2 under test. User 1 and 2 are in an active voice call
2. User 1 invites User 2 to receive a stored picture
3. User 2 accepts invitation
4. User 2 send cancellation while sharing

Expected behaviour
1. Exchange of capabilities takes place just after the call is established, and both users are able to see each other’s supported capabilities, e.g. image share.
2. User 2 gets an invitation to receive a stored image from User 1
3. The image sharing transfer is started
4. The image sharing ends for User 2 and User 1 receives cancellation notification.

55.6 IM/Chat

55.6.1 Chat 1 to 1. Start from phonebook

Description
Select from the phonebook a currently registered RCS user. Try to establish an IM session from sender to receiver. Exchange several IMs from both sides and verify in all the cases the sender receives notifications reporting “Delivered”/“Displayed” events; the receiver gets the messages and also receives notifications reporting “Is Composing” events from the sender.
Related core specifications

GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test

Verify the notification of each message (and associated events) for both users during session setup and once chat session has been setup. Verify all the messages are stored in both devices, together with some kind of time indication and an appropriate indication of the part that has been sent by each user. Verify all the conversations held with the same contact will be displayed in a single thread, ordering stored messages on a timeline basis.

Initial configuration

RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).

Both UEs are powered on.

Both UEs/clients are registered and the registration timer is far from expiration.

Both UEs camp in any radio network that allows Instant Messaging.

The test shall be performed taking into account autoconfiguration parameter IM SESSION START (value selection is MNO dependant) modifies the behaviour of RCS clients in terms of which events determine IM session is established. Three scenarios are possible: Scenario A (IM SESSION START=0), Scenario B (IM SESSION START=1) and Scenario C (IM SESSION START=2)

Test Procedure

Scenario A: IM SESSION START=0

1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects chat option
3. User 1 sends chat invitation to User 2
4. User 2 selects the message from the notification bar (accepts invitation)
5. Once the chat session is established between User 1 and User 2, any of them:
   a. Can start typing some text in a message
   b. Can send the message to the other user, or
   c. Can remove the message composed so far (empty message box)

Scenario B: IM SESSION START=1

1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects chat option
3. User 1 sends chat invitation to User 2
4. User 2 selects the message from the notification bar
5. User 2 starts typing a message back (accepts invitation)
6. Once the chat session is established between User 1 and User 2, any of them:
   a. Can start typing some text in a message
   b. Can send the message to the other user, or
   c. Can remove the message composed so far (empty message box)

Scenario C: IM SESSION START=2

1. User 1 selects a contact (User 2) from UE1’s phonebook
2. User 1 selects chat option
3. User 1 sends chat invitation to User 2
4. User 2 selects the message from the notification bar
5. User 2 starts typing a message back and presses “Send” (accepts invitation)
6. Once the chat session is established between User 1 and User 2, any of them:
   a. Can start typing some text in a message
   b. Can send the message to the other user, or
   c. Can remove the message composed so far (empty message box)

**Expected behaviour**

**Scenario A: IM SESSION START=0**
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
4. User 2’s chat window is opened, the session is established. User 1 sees the message “Displayed” notification.
5. All the messages are stored in both devices, together with some kind of time indication and an appropriate indication of the part that has been sent by each user. All the conversations held with the same contact will be displayed in a single thread, ordering stored messages on a timeline basis.
   a. An "Is Composing" notification should be seen by the other user.
   b. The sender shall see typed message as “Sent”. The ‘Is Composing’ indication will be removed from the receiver UI when a new message is received. The new message is displayed on the receiver’s chat window that handles the conversation with the sender; while sender sees its typed message “Delivered” and almost immediately “Displayed”.
   c. The 'Is Composing' indication will be again removed from the receiver’s UI

**Scenario B: IM SESSION START=1**
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
4. User 2’s chat window is opened. User 1 sees the message “Displayed” notification.
5. The session is established.
6. All the messages are stored in both devices, together with some kind of time indication and an appropriate indication of the part that has been sent by each user. All the conversations held with the same contact will be displayed in a single thread, ordering stored messages on a timeline basis.
   a. An "Is Composing" notification should be seen by the other user.
   b. The sender shall see typed message as “Sent”. The ‘Is Composing’ indication will be removed from the receiver UI when a new message is received. The new message is displayed on the receiver’s chat window that handles the conversation with the sender; while sender sees its typed message “Delivered” and almost immediately “Displayed”.
   c. The 'Is Composing' indication will be again removed from the receiver’s UI

**Scenario C: IM SESSION START=2**
1. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
4. User 2’s chat window is opened. User 1 sees the message “Displayed” notification.
5. The session is established. User 2 sees the message has been “Sent” but not yet delivered. User 1 sees message from User 2 in UE1’s chat window. User 1 sees the message “Delivered” notification and almost immediately the message “Displayed” notification.

6. All the messages are stored in both devices, together with some kind of time indication and an appropriate indication of the part that has been sent by each user. All the conversations held with the same contact will be displayed in a single thread, ordering stored messages on a timeline basis.
   a. An "Is Composing" notification should be seen by the other user.
   b. The sender shall see typed message as “Sent”. The ‘Is Composing’ indication will be removed from the receiver UI when a new message is received. The new message is displayed on the receiver’s chat window that handles the conversation with the sender; while sender sees its typed message “Delivered” and almost immediately “Displayed”.
   c. The 'Is Composing' indication will be again removed from the receiver’s UI

55.6.2 Chat starting / No answer from User 2

Description
Select from the chat/IM application a currently registered RCS user. Try to establish an IM session from sender to receiver. Receiver does not answer the invitation. Chat session is not set up and after invitation time expires, the invitation is cancelled by the IM server.

Related core specifications

Reason for test
Verify the RCS client offers the possibility not to respond a chat invitation, and the relevant notifications can be received and displayed in both sides.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UE are powered on.
Both UE/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UE camp in any radio network that allows Instant Messaging.

Test Procedure
1. User 1 starts a chat conversation by sending a message to User 2 (invitation).
2. User 2 does not respond the invitation to start chatting.

Expected behaviour
1. User 1 sees the message displayed on the chat window with the delivery notification but without the displayed notification.
2. User 2 sees message notification but he/she decides not to open the chat. Chat session is not set up and after invitation time expires, the invitation is cancelled by the IM server.

55.6.3 Chat 1 to 1. Local black list

Description
Select from the phonebook a currently registered RCS user that has included the sender in its local black list. Try to establish an IM session from sender to receiver and verify the incoming IM is silently discarded.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify the RCS client offers the possibility to blacklist other RCS users; so any IM or other RCS related invitation coming from them is silently discarded.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM).
User 2 is stored in UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.
User 2 has put User 1 on UE2’s black list.
DUT is UE2.

Test Procedure
1. User 1 selects a contact (User 2) from UE1’s phonebook.
2. User 1 selects chat option.
3. User 1 sends a message to User 2 (chat invitation).

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 from the address book.
2. –
3. The message is not displayed in User 2’s notification bar; it is stored in the “spam” folder. The message is notified to User 1 as delivered but not displayed. The session is declined; however the delivery notification is still issued.

55.6.4 Prevent display notifications
Description
Select from the chat/IM application a currently registered RCS user. Try to establish an IM session from sender to receiver. The receiver who has set display notification OFF answers the invitation. The sender sees the messages as delivered but not displayed.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to prevent display notifications.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UEs camp in any radio network that allows Instant Messaging.

Test Procedure
1. User 1 set Display notifications to OFF. User 2 sends a message to User 1 (chat invitation).
2. User 1 selects the message notification (accepts invitation).

Expected behaviour
1. User 2 stays with the chat window open.
2. User 2 sees the messages as delivered but not displayed.

55.6.5 Chat 1 to 1. Composing chat window / leaving background (MultiRAB + MMS). Notifications in background mode

Description
Once chat session has been set up between two UEs, User 1 decides to leave the chat for managing any other functionality from the mobile home screen without closing chat window (such as managing an incoming MMS). The chat session remains active and User 1 receives notifications from User 2 in background mode.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client can be executed in background mode, in a multiRAB scenario (incoming MMS).
Verify the RCS client can receive and display notifications even when it is executed in background mode.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
All UEs (UE1, UE2, UE3) are powered on.
Both UE1 and UE2/clients are online: registered and the registration timer is far from expiration.
Both UE1 and UE2 camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM).
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.

Test Procedure
1. User 1 sends chat invitation to User 2.
2. User 2 selects the message from the notification bar.
3. User 2 replies to User 1
4. User3 sends an MMS to User1
5. User1 opens MMS.
6. User 2 replies to User 1
7. User 1’s chat window is in background and receives an incoming voice call from User 3. Simultaneously, user 1 receives a chat message from user 2.

Expected behaviour
1. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from A in the notification bar. User 1 sees the message “Delivered” notification.
2. User 2’s chat window is opened. User 1 sees the message “Displayed” notification.
3. User 2 sees the message has been “Sent” but not yet delivered. User 1 gets the new message from user 2 on UE1 chat window. User 2 sees the message “Delivered” notification and almost immediately the message “Displayed” notification.
4. User 1 receives MMS notification
5. MMS is displayed to User 1. Chat window and IM session is kept active in background
6. User 1 gets the new message from user 2 displayed in the notification bar. User 2 sees that the new message sent is delivered but not displayed yet. Chat session remains active
7. User 1’s chat will trigger a status notification (UI dependant) so the user is aware of the new message and, if chosen; gets back to the chat composing window to answer it.
55.6.6 Chat 1 to 1. Composing chat window / go back foreground

Description
Once chat session has been set up between UE1 and UE2, User 1 decides to leave the chat on background mode. The chat session remains active and User 1 receives incoming text message notifications from User 2 in background mode. Verify there are mechanisms to foreground the chat window and all the on-going messages with User 2 will displayed.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client can transition from background mode to foreground mode and that the text messages pending to be displayed are recovered.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs (UE1 and UE2) are powered on.
Both UEs/clients are online: registered and the registration timer is far from expiration.
Both UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM).
User 2 MSISDN is on UE1’s phonebook, UE1 has already identified User 2 as an online RCS user.

Test Procedure
1. User 1 sends chat invitation to User 2.
2. User 2 selects the message from the notification bar
4. User 1 sets chat window and IM session in background mode by switching to another application.
5. User 2 replies to User 1.
6. User 1 decides to go back to chat window. Three options are available to do that:
   a. Navigate through the list of opened applications and open the chat window
   b. by going back to IM/chat application, or
   c. by selecting user 2 from the phonebook.

Expected behaviour
1. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
2. User 2’s chat window is opened. User 1 sees the message “Displayed” notification.
3. User 2 sees the message has been “Sent” but not yet delivered. User 1 gets the new message from user 2 on UE1 chat window. User 2 sees the message “Delivered” notification and almost immediately the message “Displayed” notification.
4. Chat window and IM session is kept active in background
5. User 1 gets the new message from user 2 displayed in the notification bar. User 2 sees that the new message sent is delivered but not displayed yet. Chat session remains active.
6. All three ways will put the chat window into the foreground and all the on-going messages with user 2 will be displayed. The relevant displayed notifications are generated, so user 2 sees the pending messages as displayed.
55.6.7  Closing a chat window (by initiator) / Re-opening a chat (not by initiator)

Description
Select from the chat/IM application a currently registered RCS user. Establish an IM session. Sender closes the chat window. Receiver remains in the chat window and re-establishes the chat session.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to re-establish a chat session after the remote user closed the previous chat window, the relevant notifications can be received and displayed in both sides.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UE are powered on.
Both UE/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UE camp in any radio network that allows Instant Messaging.
DUT is User 1.

Test Procedure
1. User 1 sends a message to User 2 (chat invitation).
2. User 2 selects the message notification (accepts invitation).
3. User 1 closes the chat in the IM/chat application.
4. User 2 remains in the chat window and sends a message to User 1 (chat invitation).
5. User 1 selects the message notification (accepts invitation).

Expected behaviour
1. User 2 opens the chat window.
2. A chat session has been established between User 1 and User 2.
3. –
4. User 1 receives a new message notification.
5. The chat session has been re-established between User 1 and User 2.

55.6.8  Chat forced interruption

Description
Select from the chat/IM application a currently registered RCS user. Try to establish an IM session. When chat has been forced ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi), the session is terminated.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to close a chat by any abnormal interruption such as loss of network coverage, and relevant notifications can be received and displayed in both sides.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UE are powered on.
Both UE/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UE camp in any radio network that allows Instant Messaging.
DUT is User 1.

Test Procedure
1. User 1 sends a message to User 2 (chat invitation).
2. User 2 selects the message notification (accepts invitation).
3. User 2 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi).

Expected behaviour
1. User 2 sees message notification. User 1 sees the message “Delivered” notification.
2. A chat session has been established between User 1 and User 2. User 1 sees the message “Displayed” notification.
3. Inactivity timer in the IM Server is trigged and detects that User 2 is no longer available. The session is terminated. User 1’s client performs an OPTIONs exchange to confirm User 2’s status.
   a) As S&F is not in place, User 2’s IM is not available.
   b) As S&F is in place, a message shall be shown to the User 1 to indicate that further messages will be deferred. If messages are sent and User 2 remains non-connected, User 1 will not get delivery or displayed notifications.

55.6.9 Chat message limit

Description
Select from the chat/IM application a currently registered RCS user. Try to establish an IM session from sender to receiver. User 1 cannot write a very long message after the limit is reached.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility not to write more characters when reaches the chat message limit.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UE are powered on.
Both UE/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UE camp in any radio network that allow Instant Messaging.
Both User 1 and User 2 are in a chat session and have exchanged several messages.

Test Procedure
User 1 writes a very long message and reaches the chat message limit.

Expected behaviour
User 1 cannot write more characters after the limit is reached.
55.6.10 Simultaneous invites

Description
Two users try to establish an IM session by simultaneously sending a message to each other. Both users successfully send and receive the message from the other party.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS clients offer the possibility to start a chat simultaneously, and relevant notifications can be received and displayed in both sides.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).
Both UE are powered on.
Both UE/clients are registered and the registration timer is far from expiration.
Both User 1 and User 2 UE camp in any radio network that allows Instant Messaging.

Test Procedure
1. User 1 starts a chat from the address book with User 2. User 2 starts a chat from the address book with User 1.
2. They both compose a message and they simultaneously send it.

Expected behaviour
1. Both users successfully send and receive the message from the other party.
2. Delivery and display notifications follow on both ends.

55.6.11 1-2-1 Chat race: Invite after a chat has been accepted (B.10)

Description
Select from the phonebook a currently registered RCS user. Try to establish an IM session from User 1 to User 2. Let User 1 send a second message at the same time User 2 accepts chat session. Ensure proper delivery of both messages and corresponding notifications.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client implements specific features for IM interaction under B.10 scenario.

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2).
Both UEs are powered on.
Both UEs/clients are registered and the registration timer is far from expiration.
Both UEs camp in any radio network that allows Instant Messaging.

The test shall be performed taking into account autoconfiguration parameter IM SESSION START (value selection is MNO dependant) modifies the behaviour of RCS clients in terms of which events determine IM session is established. Three scenarios are possible: Scenario A (IM SESSION START=0), Scenario B (IM SESSION START=1) and Scenario C (IM SESSION START=2)

Test Procedure
Scenario A: IM SESSION START=0
1. User 1 sends new message (chat invitation) to User 2
2. User 1 composes a second message to User 2. User 2 has not yet accepted the invitation
3. User 2 selects the first message from the notification bar (accepts invitation). At the same time, user 1 sends a second message

**Scenario B: IM SESSION START=1**
1. User 1 sends new message (chat invitation) to User 2
2. User 1 composes a second message to User 2.
3. User 2 selects the first message from the notification bar, and starts to type a message back in UE2’s chat window (accepts invitation). At the same time, user 1 sends a second message

**Scenario C: IM SESSION START=2**
1. User 1 sends new message (chat invitation) to User 2
2. User 1 composes a second message to User 2.
3. User 2 selects the first message from the notification bar, starts to type a message back in UE2’s chat window and presses “Send” button (accepts invitation). At the same time, User 1 sends a second message

**Expected behaviour**

**Scenario A: IM SESSION START=0**
1. User 1 sees the first message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
2. –
3. UE2’s chat window is opened, the session is established. User 1 sees the first message “Displayed” notification. User 1 sees the second message as “sent” but not yet delivered. User 2 receives the second message. User 1 sees this second message as “Delivered” and almost immediately as “Displayed”.

**Scenario B: IM SESSION START=1**
1. User 1 sees the first message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
2. –
3. UE2’s chat window is opened, as soon as User 2 starts typing the session is established. User 1 sees the first message “Displayed” notification. User 1 sees the second message as “Sent” but not yet delivered. User 2 receives the second message. User 1 sees this second message as “Delivered” and almost immediately as “Displayed”.

**Scenario C: IM SESSION START=2**
1. User 1 sees the first message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
2. –
3. UE2’s chat window is opened, User 2 then starts typing and when pressing “Send” button the session is established. User 1 sees the first message “Displayed” notification. User 1 sees the second message as “Sent” but not yet delivered. User 2 receives the second message. User 1 sees this second message as “Delivered” and almost immediately as “Displayed”. User 2 sees his/her reply as “Sent” but not yet delivered. User 1 sees the reply message from User 2. User 2 sees the reply as “Delivered” and almost immediately as “Displayed”.

55.6.12 Standard store and forward (B.2 and B.4)

**Description**
Select a currently offline RCS user from the address book. Send several IMs from sender to receiver. The sender will receive notifications that indicate the messages will be deferred. Once online, the receiver will get the messages and the sender will see notifications reporting “Delivered”/“Displayed”.
Related core specifications

Reason for test
Verify the RCS service provides a possibility to store and forward messages when the receiver is offline (B.2), and relevant messages and notifications can be received and displayed in both sides on the scenario that the receiver comes back online when the IM session of the sender is expired. (B.4)

Initial configuration
RCS services have been previously configured successfully on both UE1/SIM Card1 pair (User 1) and UE2/SIM Card2 pair (User 2).

All UE are powered on.
Phone 1 is online: registered and the registration timer is far from expiration; Phone 2 is offline.
All user UE camp in any radio network that allows Instant Messaging (IM).

Test Procedure
1. User 1 starts a chat from the address book with User 2.
2. User 1 sends four messages.
3. After User 1 chat session expired, User 2 is back online.
4. User 2 opens the chat window.
5. User 2 sends a message to User 1.

Expected behaviour
1. User 1 gets a notification that the messages will be deferred.
2. User 1 does not get delivery/display notifications.
3. User 2 gets the message notifications.
4. User 1 gets the notifications delivery/displayed.
5. User 1 receives the message from User 2. User 2 sees delivery notifications from User 1.

55.6.13 Chat 1 to 1. Standard store and forward (B.2 and B.4) plus additional concurrent chat

Description
Select from the phonebook a currently unregistered RCS user. Try to establish an IM session from sender to target user and verify deferred notifications are received from the Store & Forward functionality. The target user gets online after chat session expiration while sender is still online, thus target user will receive all pending messages. During the whole test, the sender is handling a concurrent chat with a third party which keeps sending messages to sender.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client implements specific features for interacting with S&F under B.2 and B.4 scenarios. The sender handles a concurrent chat with a third party

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1) and UE2/SIM CARD2 pair (User 2) and UE3/SIM CARD3 pair (User 3).

Both UE 1 and UE 3 are powered on, UE 2 is powered off.
Both UE 1/client 1 and UE 3/client 3 are online: registered and the registration timer is far from expiration
All UEs camp in any radio network that allows both File Transfer (FT) and Instant Messaging (IM)
UE1 and UE3 are already in a chat session
Store & Forward network support is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.

Test Procedure
1. User 1 selects a contact (User 2) from UE1 phonebook
2. User 1 selects chat option
3. User 3 sends a message to User 1.
4. User 1 sends four messages to user 2 (chat invitation)
5. User 3 sends a message to User 1.
6. It takes a while until the User 1 chat session expires (network dependent parameter). Once expired, UE 2 is powered on
7. User 2 opens the chat window
8. User 3 sends a message to User 1.

Expected behaviour
1. UE1’s chat window representing User 1-User 3 thread goes into background. A capability exchange is made when User 1 selects User 2 from UE1’s phonebook.
2. –
3. The message is displayed in User 1’s notification bar. User 3 is notified that the message was “delivered” but not displayed
4. A chat session is established between User 1 and the network S&F feature. User 1 gets notification that the messages will be deferred (User 1 will not get delivery/display notifications until User 2 is back online)
5. The message is displayed in User 1’s notification bar. User 3 is notified that the message was “delivered” but not displayed
6. Once online, User 2 gets the 4 pending messages (notification bar). User 1 starts receiving “delivered” notifications.
7. User 1 starts receiving the “displayed” notifications for all four messages sent to User 2
8. The message is displayed in User 1’s notification bar. User 3 is notified that the message was “delivered” but not displayed

55.6.14 Store and forward with intermediate sessions active (B.2 and B.3)

Description
Select a currently offline RCS user from the address book. Send several IMs from sender to receiver. The sender will receive the corresponding notifications which indicate that those messages would be deferred. Once online, the receiver will get the messages and the sender will see notifications reporting “Delivered”/”Displayed”. The sender’s session keeps alive during the whole process.

Related core specifications

Reason for test
Verify the RCS service provide a possibility to store and forward messages when receiver is offline (B.2), and relevant messages and notifications can be received and displayed in both sides on the scenario that receiver comes back online when the IM session of sender is not expired. (B.3)

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2).
All UE are powered on.
Phone 1 is online: registered and the registration timer is far from expiration; Phone 2 is offline.
All user UE camp in any radio network that allows Instant Messaging (IM).

Test Procedure
1. User 1 starts a chat from the address book with User 2.
2. User 1 sends four messages.
3. After the 4th message, User 2 comes online, gets the messages and decides to open the chat window.
4. User 2 opens the chat window.
5. User 2 sends a message to User 1. User 1 receives the message from User 2.
6. While the deferred messages are being delivered, User 1 sends an additional fifth message.

Expected behaviour
1. User 1 gets a notification that the messages will be deferred.
2. User 1 does not get delivery/display notifications until User 2 is back online.
3. Once online, User 2 gets the message notification. Verify: the first message is provided in a notification, the rest do not cause a notification.
4. User 1 sees the notifications delivery/displayed.
5. User 2 sees delivery notifications from User 1.
6. User 2 gets the message notification. Verify: the fifth message arrives with the right date.

55.6.15 Store and forward of notifications (B.5 and B.6)

Description
Select a currently offline RCS user from the address book. Send several IMs from sender to receiver. The sender will receive notifications that indicate the messages will be deferred. Then the sender goes offline and receiver back online. The receiver will get the messages and the sender will see notifications reporting “Delivered”/“Displayed” after sender come back online.

Related core specifications

Reason for test
Verify the RCS service provide possibility to store and forward notifications when sender is offline. (B.5 & B.6)

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2).
All UE are powered on.
Phone 1 is online: registered and the registration timer is far from expiration; Phone 2 is offline.
All user UE camp in any radio network that allows Instant Messaging (IM).

Test Procedure
1. User 1 starts a chat from the address book with User 2 by sending four messages.
2. User 1 goes offline and User 2 comes back online.
3. User 2 selects the message notification to open the chat window and sends some messages back to User 1.
4. It takes a while so the User 2 chat session expires. User 1 comes back online.
5. User 1 selects the message notification to open the chat window.

**Expected behaviour**

1. User 1 gets a notification that the messages will be deferred.
2. User 1 does not get delivery/display notifications.
3. User 2 gets the message notifications. Verify: The first message is provided in a notification, the rest do not cause a notification.
4. User 1 gets the notifications delivery/displayed and the message sent by User 2. User 2 gets delivery notification.
5. User 2 gets display notification.

### 55.6.16 Unanswered chat (without store and forward) (B.7)

**Description**

Select a currently registered online RCS user from the address book. Send several IMs from sender to receiver. The receiver do not open chat window until invites are expired. After receiver opens the chat window, the sender will see notifications reporting “Delivered”/”Displayed”.

**Related core specifications**


**Reason for test**

Verify that messages and notifications can be successfully transmitted even when the initial invitation is expired. (B.7)

**Initial configuration**

RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2).

All UE are powered on.

All UE/clients are online: registered and the registration timer is far from expiration.

All user UE camp in any radio network that allows Instant Messaging (IM).

**Test Procedure**

1. User 1 sends three messages to User 2.
2. User 2 does not open the chat window.
3. User 1 stops sending messages and enough time passes so the invite is expired.
4. User 2 opens the chat window.

**Expected behaviour**

1. User 2 gets three message notifications.
2. User 1 gets the delivery notifications.
3. –
4. User 1 gets the display notifications.

### 55.6.17 Change chat 1 to 1 into one to many (Group Chat)

**Description**

Select from the phonebook a currently registered RCS user to establish an IM session with. Add a new participant in the chat to verify it is possible to evolve the session into a group chat.

**Related core specifications**

GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify the RCS client offers the possibility to evolve a 1 to 1 chat into a group chat.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2) and UE3/SIM CARD3 pair (User 3).
All UEs are powered on.
All UEs/clients are online: registered and the registration timer is far from expiration
All UEs camp in any radio network that allows Instant Messaging (IM)
Group Chat network support is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.

Test Procedure
1. User 1 sends chat invitation to User 2
2. User 2 selects the message from the notification bar
3. User 2 starts typing a message back and presses “Send”
4. User 1 sends another message to user 2
5. User 1 presses the option in UE1’s chat window to add a new participant.
6. User 1 selects user 3 from RCS contact list and invites it to join the chat by sending a message invitation
7. User 3 gets the notification that he/she has been invited to a group chat and decides to join (consuming the message/opening the chat window)
8. User 2 leaves the Group Chat.

Expected behaviour
1. User 1 sees the message has been “Sent” but not yet delivered. User 2 sees message from User 1 in the notification bar. User 1 sees the message “Delivered” notification.
2. User 2’s chat window is opened, where message from User 1 is shown. User 1 sees the message “Displayed” notification.
3. User 2 sees the reply has been “Sent” but not yet delivered. User 1 sees reply from User 2 in UE1’s chat window. User 1 sees the message “Delivered” notification and almost immediately the message “Displayed” notification.
4. User 1 sees the second message as “sent” but not yet delivered. User 2 receives the second message. User 1 sees this second message as “Delivered” and almost immediately as “Displayed”.
5. The list of RCS contacts is displayed on UE1
6. A capability exchange is made when User 1 selects User 3 from UE1 address book.
7. 1-to-1 chat window between User 1 and User 2 moves to chat list view. New chat screen is opened with User 1, User 2 and User 3 and it shall not contain any message history from the 1-to-1 chat. File transfer becomes unavailable. Delivery/Displayed notifications are no longer available.
8. User 1 and User 3 receive notification ”User 2 has left the conversation”. No new chat screen is opened for User 1 and User 3.

55.6.18 Initiating a Group Chat / add new participants

Description
Select from the chat/IM application two currently registered RCS users. Try to establish group chat . As soon as it is established with all initially requested participants, request to add two new participants. The fourth one will reject the invitation; the fifth one will accept it.
Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to start group chat.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2), UE3/SIM CARD3 pair (User 3), UE4/SIM CARD4 pair (User 4) and UE5/SIM CARD5 pair (User 5).
All UEs are powered on.
All UEs/clients are online: registered and the registration timer is far from expiration
All UEs camp in any radio network that allows Instant Messaging (IM)
All UEs are not configured for auto-accept of chat invitation.
Group Chat network support is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.

Test Procedure
1. User 1 selects users 2 and 3 from UE1's IM/chat application to start a group chat.
2. User 1 sends a message to invite 2 and 3 to the group chat.
3. User 2 and 3 accepts the invitation.
4. User 1 starts typing text in the IM/chat application client.
5. User 1 stops typing text in the message and sends the message to the rest of participants.
6. User 1 searches for a new participant (user 4) in the phonebook or IM/chat application
7. User 1 sends an invitation to User 4 in order to join the Group Chat
8. User 4 rejects invitation
9. User 1 searches for a new participant (user 5) in the phonebook or IM/chat application
10. User 1 sends an invitation to User 5 to join the Group Chat
11. User 5 accepts invitation

Expected behaviour
1. A capability exchange is made when User 1 selects User 2 and User 3 from UE1's IM/chat application.
2. UE1 starts an IM session with the IM server and this one starts therefore new IM sessions with users 2 and 3. Both UE2 and UE3 receive a group chat invitation.
3. Users 2 and 3 are connected to the group chat. A notification (UI dependant) will be displayed on each device to inform about any incoming message. Notification must clearly state that it is a Group Chat. Each UE identifies the other participants with a user friendly name that match with the name store in the phonebook or IM/chat application.
4. IM/chat application client in both UE2 and UE3 reports User 1 is typing
5. The new message sent by 1 is displayed in both UE2 and UE3 application client Group Chat window. Delivery/Displayed notifications are no longer available on UE1.
6. A capability exchange is made when User 1 selects User 4 from the IM/chat application.
7. User 4 receives a group chat invitation.
8. User 4 does not join the Group Chat. User 1 is notified about the result.
9. A capability exchange is made when User 1 selects User 5 from the IM/chat application.
10. User 5 receives a group chat invitation.
11. User 5 joins the Group Chat. User 1 is notified about the result. IM/chat application client in each device (User 1, User 2, User 3 and User 5) updates the participant list with current participants.

55.6.19 VOID

55.6.20 Leaving a Group Chat

Description
Establish a group chat (with at least 3 participants) and users leave the Group chat until it remains 2 users.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to abandon a group chat, even to the initiator, while the rest of participants keep on chatting.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM CARD1 pair (User 1), UE2/SIM CARD2 pair (User 2), UE3/SIM CARD3 pair (User 3) and UE4/SIM CARD4 pair (user 4)
All UEs are powered on.
All UEs/clients are online: registered and the registration timer is far from expiration
All UEs camp in any radio network that allows Instant Messaging (IM)
Group Chat network support is an OPTIONAL feature (MNO network dependant), if not implemented in the network this test is Not Applicable.

Test Procedure
1. User 1 selects users 2, 3 and 4 from IM/chat application to start a chat.
2. User 1 sends a message to invite User 2, 3 and 4 to the group chat.
3. Users 2, 3 and 4 accept the invitation.
4. User 2 starts typing text in the IM/chat application client.
5. User 2 stops typing text in the message and sends the message to the rest of participants.
6. User 4 decides to leave the Group Chat and closes the IM/chat application
7. User 2 starts typing text in the IM/chat application client.
8. User 2 stops typing text in the message and sends the message to the rest of participants.
9. User 1 (the one that previously initiated the Group Chat) decides to leave the Group Chat and closes the IM/chat application.
10. User 3 continues to send a message to User 2.

Expected behaviour
1. A capability exchange is made when User 1 selects User 2, User 3 and User 4 from UE1’s IM/chat application.
2. UE1 starts an IM session with the IM server and this one starts therefore new IM sessions with users 2, 3 and 4. These three users receive a group chat invitation.
3. Users 2, 3 and 4 are connected to the group chat. A notification (UI dependant) will be displayed on each device to inform about any incoming message. Notification must clearly state that it is a Group Chat. Each UE identifies the other participants with a user friendly name that match with the name stored in the phonebook or IM/chat application.
4. IM/chat application client in UE1, UE3 and UE4) reports User 2 is typing
5. The new message sent by User 2 is displayed in all UE1, UE3, UE4 application client Group Chat windows. Delivery/Displayed notifications are no longer available on UE2.

6. User 4’s IM session is closed and the rest of the participants (User 1, 2 and 3) receive a notification reporting that “user 4 has left the conversation”. Each device from User 1, User 2 and User 3 remove user 4 from the list of current participants.

7. IM/chat application client in each remaining device (UE1 and UE3) reports User 2 is typing

8. The new message sent by User 2 is displayed in UE1 and UE3 application client Group Chat windows

9. User 1’s IM session is closed and the rest of the participants (User 2&3) receive a notification reporting that “user 1 has left the conversation”. Each device from User 2&3 remove user 1 from the list of current participants. The session remains open for User 2&3.

10. The IM/Chat between User 2 and User 3 is still active, and User 2 receives the message.

55.6.21 Leaving a group chat (other than initiator) and attempts to re-join

Description
When User X (other than initiator) in a group chat leaves the chat, the other people will see notification that “User X has left the conversation” and automatically remove User X from current participants’ list. When only two participants remain, group chat becomes 1-to-1 chat. In the four member group chat case, User 4 leaves normally and User 3 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi).

Related core specifications

Reason for test
Verify the RCS client provide possibility to notify other member when someone leaves (other than initiator) in a group, and update other members’ participant list.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3) and UE4/SIM Card4 pair (User 4).
All UE are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Users 1, 2, 3 and 4 have established a Group Chat session between them.

Test Procedure
1. User 4 decides to leave the Group Chat and closes the IM/chat application.
2. User 3 forces ungracefully deregistration (e.g. by taking out the battery, taking out the SIM card or by taking down the coverage-including WiFi).
3. After a while, User 4 decides to re-join the same Group Chat session he closed before.

Expected behaviour
1. User 4’s IM session is closed and the rest of the participants (User 1&2&3) receive a notification that “User 4 has left the conversation”. Users 1&2&3 remove User 4 from the list of current participants.
2. The rest of the participants (User 1&2) see that “User 3 is unavailable”. The Chat session shall be active between the remaining 2 users. File Transfer button is NOT shown as available for User 1 and User 2.
3. User 4 might not be able to proactively re-join the same chat session that he/she has left. UE4 is not automatically re-joined to the Group Chat at restart.
**55.6.24 Inviting an Unregistered User**

**Description**
Addition of new unregistered user into a Group Chat.

**Related core specifications**
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**
The purpose of this test is to verify that an unregistered user, who will be added in a Group Chat will register and be able to join the Chat session.

**Initial configuration**
UE1 / SIM CARD1 (User 1), UE2 / SIM CARD2 (User 2), UE3 / SIM CARD3 (User 3) are registered and able to access IMS/RCS core network and relevant servers
UE4 / SIM CARD4 (User 4) is unregistered (meaning: device is powered off, disabled the joyn service)
Supported by network: 2G, 3G, HSPA, Wi-Fi

**Test Procedure**
2. The users of the chat exchange messages between themselves. They stop the chat. The chat session expires for timeout.
3. User 4 registered. (meaning: device is powered on, enables the joyn service)
4. User 1 (or User 2 or User 3) sends a new message, restarting the session.

**Expected behaviour**
1. Users 1, 2 & 3 should see in the participant list that User 4 is not available (offline)
2. The users shall see the notifications of "is typing" between the users
3. User 4 registers to RCS but is still not aware of the on-going chat.
4. User 4 is then invited again and can join the Group Chat.

   When User 4 enters the chat session, the other users shall NOT see any notification of a new user joining, and shall see in the participation list that User 4 is active.

   Also, User 4 shall not receive any message from the chat session before User 4 joined.

**55.6.25 Re-Start a Group Chat (after timeout)**

**Description**
After the timeout of Group Chat expired, the Chat Group session can restart by a message sent from one member of the Group Chat.

**Related core specifications**
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

**Reason for test**
Verify that although the session Chat is inactive the message sent by one user to the Group Chat can re-activate the Chat session.

**Initial configuration**
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3) and UE4/SIM Card4 pair (User 4).
All UEs are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure
1. Users 1, 2, 3 & 4 establish a Group Chat and exchange messages.
2. They stop exchanging messages and wait for the session timer to expire.
3. After the time has expired a user sends a new message.

Expected behaviour
1. The Group Chat has been established and messages are sent and received.
2. The session will expire after the defined time.
3. The Group Chat session is re-established and the message is received by other 3 users.

55.6.26 Simultaneous Re-start Group Chat (after timeout)
Description
Same scenario of Test Case 55.6.25 but with two users sending a message simultaneously.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that although the Group Chat session is inactive a message sent by two users simultaneously can restart the Group Chat session.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3) and UE4/SIM Card4 pair (User 4).
All UEs are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure
1. Users 1, 2, 3 & 4 establish a Group Chat and exchange messages.
2. They stop exchanging messages and wait for the session timer to expire.
3. After the timer has expired a user 1 & 2 send both a new message at the same time.

Expected behaviour
1. The Group Chat has been established and messages are sent and received.
2. The session will expire after the defined time.
3. The Group Chat session is re-established and the message is received by other 3 users.

55.6.27 Re-start a Group Chat with some users offline
Description
A user who was offline after a timeout expired is invited to a new Chat Group session when one active user of the Chat session sends him a message.
Reason for test
Verify that Group Chat session is possible with users who were offline (not registered) by receiving a message from an active user once this user is registered.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3) and UE4/SIM Card4 pair (User 4).

All UEs are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure
1. Users 1, 2, 3 & 4 establish a Group Chat and exchange messages.
2. They stop exchanging messages and wait for the session timer to expire.
3. After the timer has expired User 4 unregisters (data connection lost, turn off device, disable joyn services)
4. User 1 send a new message.
5. User 4 registers back to the RCS service.

Expected behaviour
1. The Group Chat has been established and messages are sent and received
2. The session will expire after the defined time.
3. User 4 is offline for RCS services.
4. The Group Chat session is re-established among the remaining users and message is received. User 4 is shown to the other Users as inactive.

55.6.28 Re-start a Group Chat with some users offline and adding more users. No new session is created

Description
A user who was offline becomes active in the Group Chat after being invited by a new user of the group.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a user who is offline can be added into a Group Chat session by a new user.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3), UE4/SIM Card4 pair (User 4) and UE5/SIM Card5 pair (User 5).

All UEs are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Supported by network: 2G, 3G, HSPA, Wi-Fi.
Test Procedure

1. User 1, User 2, User 3 and User 4 are in a Group Chat, exchanging messages. User 4 loses coverage (data loss, turn off, taken battery).
2. Users stop exchanging messages and wait for the session timer to expire.
3. User 1 sends a new message in the Group Chat session. User 1 invites User 5 to the group chat.
4. User 4 registers back (without sending a message). User 5 sends some messages.

Expected behaviour

1. The active Users shall see User 4 as inactive.
2. The session will expire after the defined time.
3. The Group Chat shall start again. IM/chat application client in each device updates the participant list with the joined participant User 5.
4. When User 4 registers back, the client shall perform a successful re-join procedure to the group chat. User 4 shall see in the participant list that User 4 is active. New messages shall be received by User 4.

55.6.29 Re-start a Group Chat with some users offline and adding more users. Offline user creates a new session

Description

A user who is offline and cannot become active in a Group Chat is invited by a new user. Therefore a new group chat is created and all active users of the current Group Chat shall automatically join the new Group Chat.

Related core specifications

GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test

Verify that a Group Chat can be created by a new user who invites an offline user who cannot re-enter to the current Group Chat and all participants are systematically invited to the new Chat Group.

Initial configuration

RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3), UE4/SIM Card4 pair (User 4) and UE5/SIM Card5 pair (User 5).

All UE are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure

1. User 1, User 2, User 3 and User 4 are in a Group Chat, exchanging messages. User 4 unregisters (data loss, turn off, closes join services).
2. Users stop exchanging messages and wait for the session timer to expire.
3. User 1 sends a new message and starts exchanging messages between the other clients. User 1 invites User 5 to the Group Chat.
4. User 4 registers back and sends a message to all users in the current group (which is User 4 left). User 4 fails to attempt to re-join to the previously known active session. User 4 shall create a new Group Chat session inviting all the known participants (User 1, User 2, User 3). User 5 sends some messages.

Expected behaviour

1. The active clients shall see User 4 as inactive.
2. The session will expire after the defined time.

3. The Group Chat shall start again. IM/chat application client in each device updates the participant list with the joined participant User 5.

4. The rest of participants will auto-accept the new session and invite to this new session the missing participants. User 1, User 2, User 3 and User 5 shall send messages only in the new session. User 5 will show User 4 as an active participant.

5.6.30 Add a Same Participant

Description
The same user is invited by two different users of the same Group Chat.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that a user who receives two invitations from different members of a same Group Chat shall be able to answer only one invitation and be able to join the Group Chat while the second invitation sender will receive a rejected invitation notification.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3) and UE4/SIM Card4 pair (User 4).

All UE are powered on.

All UE/clients are online: registered and the registration timer is far from expiration.

All user UE camp in any radio network that allows Instant Messaging (IM).

Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure
1. User 1 selects User 2 and User 3 from IM/chat application to start a Group Chat.
2. User 1 sends a message to User 2 and User 3.
3. User 2 and User 3 accept the invitation.
4. User 1 searches for a new participant (User 4) in the phonebook or IM/chat application (User 4 RCS capabilities previously detected) and sends an invitation to join to the Group Chat.
5. User 2 searches for a new participant (User 4) in the phonebook or IM/chat application and sends him/her an invitation (User 4 is RCS registered).

Expected behaviour
1. A first query to know UE2 / SIM CARD2 & UE3 / SIM CARD3's real-time RCS capabilities is performed. Both users are registered for RCS.
2. User 1’s message/invitation is received by User 2 & User 3.
3. User 2 and User 3 are connected to the Group Chat. A notification (UI dependant) will be displayed on each device to inform about the incoming message. Notification must clearly state that it is a Group Chat. Each device (User 1, User 2 and User 3) identify the other participants with a user friendly name that match with the name store in the phonebook or IM/chat application.
4. User 4 receives the invitation and after accepting it, a Group Chat IM session is established between all the participants. IM/chat application client in each device (User 1, User 2, User 3 and User 4) updates the participant list with the joined participants.
5. User 2 receives a reject to his invitation of User 4 since a user is only allowed to be in a Group Chat once.
55.6.31 Too many Participants

Description
Group Chat session shall continue if a user can not join the group, due to reaching the maximum allowed participants in a Group Chat session.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that although user (n) cannot join the Group Chat of (n-1) participants the function of Chat Group session shall not be affected.

Initial configuration
RCS services have been previously configured successfully on all UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2), UE3/SIM Card3 pair (User 3), UE4/SIM Card4 pair (User 4), UE5/SIM Card5 pair (User 5) and UE6/SIM Card6 pair (User 6).
All UE are powered on.
All UE/clients are online: registered and the registration timer is far from expiration.
All user UE camp in any radio network that allows Instant Messaging (IM).
The maximum number of the participants is set to 4.
Supported by network: 2G, 3G, HSPA, Wi-Fi.

Test Procedure
1. User 1 selects User 2, User 3 and User 4 from IM/chat application to start a chat. User 1 sends a message to invite User 2, User 3 and User 4 to the Group Chat. User 4 receives an invitation and rejects it.
2. User 1 searches for a new participant (User 5) in the phonebook or IM/chat application (User 5’s RCS capabilities previously detected) and tries to invite User 5 to join the Group Chat.
3. User 1 searches for a new participant (User 6) in the phonebook or IM/chat application (User 6’s RCS capabilities previously detected) and tries to invite U to join the Group Chat.

Expected behaviour
1. User 1 starts an IM session with User 2 and User 3, and the Group Chat is established. A notification (UI dependant) will be displayed on each device to inform about the incoming message. Notification must clearly state that it is a Group Chat. Each device (User 1, User 2 and User 3) identify the other participants with a user friendly name that match with the name store in the phonebook or IM/chat application. Remember User 4 has rejected the invitation.
2. User 5 receives the invitation and after accepting it, Group Chat IM session is established between all the participants. IM/chat application client in each device (User 1, User 2, User 3 and User 5) updates the participant list with the joined participants.
3. User 6 cannot join to the group chat because the number of the participants has reached the maximum value.

55.6.32 Consolidation of Participants List at Restart

Description
A user who was offline during the active period of a Group Chat is now online and shall be able to join the Group Chat after invitation of one participant, when the Group Chat is re-started after the session timer expired..

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2
Reason for test
Verify that the offline period shall not affect the participation in a Group Chat once the user becomes RCS active.

Initial configuration
UE1 / SIM CARD1 (User 1), UE2 / SIM CARD2 (User 2) and UE3 / SIM CARD3 (User 3) are registered and able to access IMS/RCS core network and relevant servers.

UE4 / SIM CARD4 (User 4) is offline.
Supported by network: 2G, 3G, HSPA, Wi-Fi.
User 4 is able to register at a later time.
UE1 / SIM CARD1 (User 1) has established a Group Chat with UE2 / SIM CARD2 (User 2) and UE3 / SIM CARD3 (User 3).
UE1 / SIM CARD1 (User 1), UE2 / SIM CARD2 (User 2) and UE3 / SIM CARD3 (User 3) exchanged some messages.

Test Procedure
1. User 1 invites User 4.
2. Users stop exchanging messages and wait for the session timer to expire.
3. User 4 gets back online (RCS registered).
4. User 2 sends a new message to the group to restart the Group Chat.

Expected behaviour
1. User 1, User 2 and User 3 can see messages between each other. User 4 is not aware of the ongoing Group Chat.
2. The session will expire after the defined time.
3. User 4 is still not aware of the ongoing Group Chat.
4. User 1 and User 3 are silently re-invited directly. User 4 should be automatically invited by User 1 and upon joining be added to User 2 and User 3’s participant list.

55.6.33 Chat Invitation Auto Accept

Description
A user is invited to a Group Chat automatically if the Chat Invitation Auto Accept parameter is set to “On” in the provisioning service.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify that User is able to join the Chat, if Chat Invitation Auto Accept feature is enabled.

Initial configuration
UE1 / SIM CARD1 (User 1), UE2 / SIM CARD2 (User 2) and UE3 / SIM CARD3 (User 3) are registered and able to access IMS/RCS core network and relevant servers.

Supported by network: 2G, 3G, HSPA, Wi-Fi.
UE3 / SIM CARD3 (User 3) is provisioned for Auto Accept of Group Chat Invitations.
UE1 / SIM CARD1 (User 1) and UE2 / SIM CARD2 (User 2) have established a Chat Session.

Test Procedure
User 1 invites User 3 from IM/Chat application to the Chat session with User 2.
Expected behaviour
User 3 is automatically added to the Group Chat.

55.7 Multitasking

55.7.1 Incoming IM session (when the initial condition is chat): Accepted

Description
A chat is established between two currently registered RCS users. Verify that an incoming RCS chat can be accepted correctly without affecting the original chat.

Related core specifications

Reason for test
Verify the RCS client offers the possibility to accept incoming RCS chat correctly without affecting the original chat.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.

All the UE/clients are registered and the registration timer is far from expiration.

User 1, User 2 and User 3 UE camp in any radio network that allows Instant Messaging.

Test Procedure
1. User 1 is in a chat session with User2.
2. User 3 initiates a chat to User 1 by sending a new message to User 1.
3. User 1 selects the message notification (accepts invitation).
4. User 1 sends a message to User 2 and another to User 3.

Expected behaviour
1. User 1 and User 2 can receive messages from each other.
2. User 1 sees message notification from User 3.
3. The chat session between User 1 and User 3 is established.
4. User 2 and User 3 receive only the message destined for them.

55.7.2 Incoming IM session (when the initial condition is file transfer): Accepted

Description
A file transfer is established between two currently registered RCS users. Verify that an incoming RCS chat can be accepted correctly without affecting the original file transfer.

Related core specifications

Reason for test
Verify the RCS client offers the possibility to accept incoming RCS chat correctly without affecting the original file transfer.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).
All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows Instant Messaging and file transfer.

Test Procedure
1. User 1 selects a contact from its address book (User 2) and selects file transfer option.
2. User 2 accepts the invitation.
3. User 3 initiates a chat to User 1 by sending a new message to User 1.
4. User 1 selects the message notification to accept invitation.

Expected behaviour
1. User 2 receives the invitation from User 1.
2. File transferring to User 2.
3. User 1 sees message notification from User 3.
4. The chat session between User 1 and User 3 is established. Verify: file transfer and chat session are active at the same time and do not affect each other.

55.7.3 Incoming Voice Call (when the initial condition is file transfer):
Accepted and ISH/VSH

Description
A file transfer is established between two currently registered RCS users. Verify that an incoming RCS voice call can be accepted correctly without affecting the original file transfer. During the voice call, image share or video share session can be done correctly.

Related core specifications

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS voice call correctly without affecting the original file transfer. During the voice call, image share or video share session can be done correctly.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows voice call, image share, video share and file transfer.

Test Procedure
1. User 1 selects a contact from its address book (User 2) and selects file transfer option.
2. User 2 accepts the invitation.
3. User 1 initiates a voice call to User 3.
4. User 3 answers the call from User 1.
5. User 1 (calling party) invites User 3 to an image share session.
6. User 3 accepts.
7. User 1 (calling party) closes the image share session, and invites User 3 to a video share session.
8. User 3 accepts.
9. User 1, who is still sharing video with User 3 (the image had been already transferred and is still being displayed), ends the voice call.

**Expected behaviour**
1. User 2 receives the invitation from User 1.
2. File transferring to User 2.
3. File transfer remains in background.
4. Voice call is established between User 1 and User 3.
5. User 3 sees notification of sharing image.
6. Image is shared.
7. User 3 sees notification of sharing video.
8. Video is shared.
9. Voice call between User 1 and User 3 is finished, image share and video share windows are closed. File transfer comes back to foreground if it has not finished yet.

### 55.7.4 Incoming IM session (when the initial condition is voice call):

**Accepted**

**Description**
A voice call is established between two currently registered RCS users. Verify that incoming RCS chat can be accepted correctly without affecting the original voice call.

**Related core specifications**

**Reason for test**
Verify the RCS client offers the possibility to accept incoming RCS chat correctly without affecting the original voice call.

**Initial configuration**
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).
All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows Instant Messaging.

**Test Procedure**
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
3. User 3 initiates a chat to User 1 by sending a new message to User 1.
4. User 1 selects the message notification to accept invitation.

**Expected behaviour**
1. User 2 sees the incoming voice call.
2. The call is established.
3. User 1 sees message notification from User 3.
4. The chat session between User 1 and User 3 is established. Voice call and chat session are active at the same time.
55.7.5  Incoming File Transfer (when the initial condition is voice call): Accepted

Description
A voice call is established between two currently registered RCS users. Verify that incoming RCS file transfer can be accepted correctly without affecting the original voice call.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS file transfer correctly without affecting the original voice call.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.

All the UE/clients are registered and the registration timer is far from expiration.

User 1, User 2 and User 3 UE camp in any radio network that allows file transfer.

Test Procedure
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
3. User 3 selects a contact from its address book (User 2) and selects file transfer option.
4. User 2 accepts the invitation.

Expected behaviour
1. User 2 sees the incoming voice call.
2. The call is established between User 1 and User 2.
3. User 2 sees the invitation from User 3 to transfer the file.
4. File transfer begin. Both voice call and file transfer are active at the same time.

55.7.6  Incoming IM session (when the initial condition is voice call together with image sharing): Accepted

Description
A voice call is established between two currently registered RCS users; and Image sharing established between these two users. Verify that an incoming RCS chat can be accepted correctly without affecting the original voice call and image sharing.

Related core specifications
GSMA RCS - Advanced Communications: Services and Client Specification Version 1.2

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS chat correctly without affecting the original voice call and image sharing.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.

All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows Instant Messaging.

**Test Procedure**

1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
3. User 2 shares an image with User 1.
4. User 1 accepts the invitation to receive the image.
5. User 3 initiates a chat to User 1 by sending a new message to User 1.
6. User 1 selects the message notification to accept invitation.

**Expected behaviour**

1. User 2 sees the incoming voice call from User 1.
2. The call is established between User 1 and User 2.
3. User 1 receives the invitation from User 2 to share an image.
4. The image is shared.
5. User 1 sees message notification from User 3.
6. The chat session between User 1 and User 3 is set up. Image Share and chat session are active at the same time.

**55.7.7 Incoming File Transfer (when the initial condition is voice call together with image sharing): Accepted**

**Description**

A voice call is established between two currently registered RCS users; and Image sharing established between these two users. Verify if an incoming RCS file transfer will be accepted correctly without affecting the original voice call and image sharing.

**Related core specifications**


**Reason for test**

Verify the RCS client offers the possibility to accept an incoming RCS file transfer correctly without affecting the original voice call and image sharing.

**Initial configuration**

RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.

All the UE/clients are registered and the registration timer is far from expiration.

User 1, User 2 and User 3 UE camp in any radio network that allows file transfer.

**Test Procedure**

1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
3. User 2 shares an image with User 1.
4. User 1 accepts the invitation from User 2.
5. User 3 selects User 2 from its address book and selects file transfer option.
6. User 2 accepts the invitation.

**Expected behaviour**

1. User 2 receives an incoming voice call.
2. The call is established between User 1 and User 2.
3. User 1 receives an invitation to share an image.
4. The image is shared.
5. User 2 receives the invitation from User 3 to transfer a file.
6. User 2 begins receiving the file. Both image share and file transfer are active at the same time.

55.7.8 **Incoming File Transfer (when the initial condition is voice call together with image sharing): Accepted after hanging up Voice Call**

**Description**
A voice call is established between two currently registered RCS users; and Image sharing established between these two users. Verify if an incoming RCS file transfer will be accepted correctly after the original two RCS users hang up the call.

**Related core specifications**

**Reason for test**
Verify the RCS client offers the possibility to accept an incoming RCS file transfer correctly after the original voice call hang up.

**Initial configuration**
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows file transfer.

**Test Procedure**
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
3. User 2 shares an image with User 1.
4. User 1 accepts the invitation from User 2.
5. User 3 selects User 2 from its address book and selects file transfer option.
6. User 2 ignores the invitation.
7. User 1 or User 2 hangs up the call.
8. User 2 accepts the file transfer invitation (before timer expires).

**Expected behaviour**
1. User 2 receives an incoming voice call.
2. The call is established between User 1 and User 2.
3. User 1 receives an invitation to share an image.
4. The image is shared.
5. User 2 receives the invitation from User 3 to transfer a file.
6. Invite of the file transfer remains in background. Active call between User 1 and User 2 remains active.
7. Voice call between User 1 and User 2 is over.
8. User 2 begins receiving the file.
55.7.9 Incoming IM session (when the initial condition is voice call together with video sharing): Accepted

Description
A voice call is established between two currently registered RCS users; and video sharing established between these two users. Verify if an incoming RCS chat will be accepted correctly without affecting the original voice call and video sharing.

Related core specifications

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS chat correctly without affecting the original voice call and video sharing.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).

All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows Instant Messaging.

Test Procedure
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
4. User 1 accepts the invitation to receive the video.
5. User 3 initiates a chat to User 1 by sending a new message to User 1.
6. User 1 selects the message notification to accept invitation.

Expected behaviour
1. User 2 sees the incoming voice call from User 1.
2. The call is established between User 1 and User 2.
3. User 1 receives the invitation from User 2 to share video.
4. The video is shared.
5. User 1 sees message notification from User 3.
6. The chat session between User 1 and User 3 is set up. Video share and chat session are active at the same time.

55.7.10 Incoming File Transfer (when the initial condition is voice call together with video sharing): Accepted

Description
A voice call is established between two currently registered RCS users; and video sharing established between these two users. Verify if an incoming RCS file transfer will be accepted correctly without affecting the original voice call and video sharing.

Related core specifications

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS file transfer correctly without affecting the original voice call.
Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).
All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows file transfer.

Test Procedure
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
4. User 1 accepts the invitation from User 2.
5. User 3 selects User 2 from its address book and selects file transfer option.
6. User 2 accepts the invitation.

Expected behaviour
1. User 2 receives an incoming voice call.
2. The call is established between User 1 and User 2.
3. User 1 receives an invitation to share video.
4. The video is shared.
5. User 2 receives the invitation from User 3 to transfer a file.
6. User 2 begins receiving the file. Both, video share and file transfer are active at the same time.

55.7.11 Incoming File Transfer (when the initial condition is voice call together with video sharing): Accepted after hanging up Voice Call

Description
A voice call is established between two currently registered RCS users; and video sharing established between these two users. Verify if an incoming RCS file transfer will be accepted correctly after the original two RCS users hang up the call.

Related GSM core specifications

Reason for test
Verify the RCS client offers the possibility to accept an incoming RCS file transfer correctly after the original voice call hang up.

Initial configuration
RCS services have been previously configured successfully on UE1/SIM Card1 pair (User 1), UE2/SIM Card2 pair (User 2) and UE3/SIM Card3 pair (User 3).
All the UE are powered on.
All the UE/clients are registered and the registration timer is far from expiration.
User 1, User 2 and User 3 UE camp in any radio network that allows file transfer.

Test Procedure
1. User 1 initiates a voice call to User 2.
2. User 2 answers the call from User 1.
4. User 1 accepts the invitation from User 2.
5. User 3 selects User 2 from its address book and selects file transfer option.
6. User 2 ignores the invitation.
7. User 1 or User 2 hangs up the call.
8. User 2 accepts the file transfer invitation (before timer expires).

Expected behaviour
1. User 2 receives an incoming voice call.
2. The call is established between User 1 and User 2.
3. User 1 receives an invitation to share video.
4. The video is shared.
5. User 2 receives the invitation from User 3 to transfer a file.
6. Invite of the file transfer remains in background. Active call between User 1 and User 2 remains active.
7. Voice call between User 1 and User 2 is over.
8. User 2 begins receiving the file.

56 Steering of Roaming (Managed Roaming), Reject Cause #17 ‘Network Failure’

56.0 Basic description of functionality to be tested

Steering of Roaming (SoR) is a procedure used by some mobile network operators to guide a mobile device to a visited network operator of their choice while a user is roaming. In other words, steering of roaming is used by network operators to prefer one or more roaming partners over others.

When steering of roaming is used by a home network operator and a roaming mobile device is in automatic network selection mode, the preferred networks are selected by rejecting location update requests in non-preferred networks four times with MM Reject Cause #17. This triggers a new network selection in the mobile device.

If only non-preferred networks are present in a certain location or if the user has switched the mobile device into manual network selection mode, also non-preferred networks can be selected by the mobile device during the network search procedure, as an additional location update procedure (usually the 5th) in the same network may be granted.

Some network operators perform CS steering only, in which case the simultaneous packet attach is immediately accepted. Other network operators perform CS and PS steering in which the PS attach requests are also rejected. A mobile device must be able to handle both types of steering. It is therefore recommended that SoR is tested for both possibilities.

Note 1: If the attach request for the PS Domain is rejected with cause #3; #6; #8; #11; #13; #15 – the SoR mechanism does not apply.

“PS Steering” means that the UE will be rejected in CS and in the PS Domain and the Attach procedure is not accepted right away. It does not imply that UE should initiate the PLMN search based in the PS Domain registration status independent of CS Domain registration status (i.e. the UE shall not stop the PLMN search in case the PS procedure was successful while the CS procedure is still rejected).

SoR behaviour also depends on a number of SIM card fields. This is described in more detail in the different scenarios and test cases below.

For Network Mode of Operation II: When Steering of Roaming is applied, in Automatic Network Selection and the rejected network is (is not) stored on the Preferred PLMN list, after the UE has received the fourth location update reject with Reject Cause #17 'Network Failure (i.e. attempt counter >=4), it shall start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point. It shall not wait for the T3212 timer to expire. Upon rejection of ATTACH procedure with reject cause
#111 “Protocol error, unspecified”, the DUT may set the attempt counter in the PS domain being equal to maximum (>5) in case if it is compliant with Release 6 and above of 24.008.

For Network Mode of Operation I: PS auto attach shall be enabled in the device so a combined attach is performed. After the MS has received the fifth Rejection Cause #17 'Network Failure’ or #111 ‘Protocol error, unspecified’ (i.e. attempt counter >=5), it shall start a new PLMN search. The device shall not extend the PLMN selection by fallback to CS.

The new PLMN search shall happen according to the following procedure:

- The PLMN search shall be started in any case, independently from the result of the GPRS Attach / Routing Area Update procedure, independently from the Network Mode of Operation (NMO, i.e. Combined or Separate Routing Area Update) and independently of the content of the Preferred PLMN list on the SIM card.

- If other PLMNs can be found, the Terminal Device shall attempt to perform an IMSI Attach or a Location Update procedure at each of them taking into account the Attempt Counter, according to 3GPP TS 24.008 sections 4.4.4.5, 4.4.4.6 and 4.4.4.9.

- If no different PLMN apart from the rejected can be found, the terminal device shall attempt to access one of the already rejected networks once more (only one additional Location Update cycle).

  Note 2: As per requirements above, if only one PLMN is available and this PLMN was already rejected four times with Reject Cause #17 ‘Network Failure (i.e. attempt counter >=4), the terminal device shall attempt to access the already rejected network once more. Only one Location Area shall be available to be a valid test.  

  Note 3: If HPPLMN timer expires, different scenarios can occur not following the signalling flow indicated in the test descriptions.

In the test cases below, the procedure describes the case where 4 networks are available at the test location. This will of course differ from test location to test location. If the test location has for example, 6 networks available, the test procedure needs to be adjusted accordingly. For Multiple network environment tests, more networks can be used in the cycle. For Single network environment, additional networks need to be added to the FPLMN list so that only one network is available for Automatic network selection.

The minimum number of networks needed for Multiple networks environment is 3.

The minimum number of networks needed for Single network environment is 2.

There are no maximum amounts for either network environment.

### 56.1 Steering of Roaming / Rejected network not stored on Preferred PLMN list (EFPLMNwAcT)

The following items are common to all tests with regards to “Steering of Roaming / Rejected network not stored on Preferred PLMN list (EFPLMNwAcT)” and will therefore not be mentioned again in the individual test case descriptions.

**Description**

The UE shall be able to perform automatic and manual network selection when Steering of Roaming is applied and when the rejected network is not stored on Preferred PLMN list (EFPLMNwAcT) and return consistent display messages to the user.

**Related 3GPP core specifications**

TS 24.008, sub clause 4.2.1.2

**Reason for test**

To ensure that the DUT is performing a new PLMN search when Rejected network is not stored on the Preferred PLMN list, and not waiting for T3212 to expire when Steering of Roaming is applied.

**Initial configuration**

- DUT switched off, with following configuration:
• Automatic network selection mode
• GPRS Attach at power on enabled
• W-CDMA or GSM only Mode selected
• PDP context activation at Power ON is disabled.
• Backlight duration set to maximum setting (optional)

• Test to happen in live network
• Test to happen in static test location

• Networks available:
  • PLMN1: Preferred network
  • PLMN2: Non-preferred network
  • PLMN3: Non-preferred network
  • PLMN4: Non-preferred network

56.1.1 Multi Network Environment

Multiple Network Environments: This is a typical live network environment, for example, when the user switches-on his device in places such as airports, where several mobile networks are available. One or more of them are preferred and a location update is immediately successful. One or more of the networks are not preferred and location update attempts on these networks will be rejected several times as described above.

Initial configuration

• Apply Initial Configuration for “Steering of Roaming / Rejected network not stored on Preferred PLMN list” above.
• Used SIM card: Roaming SIM Card (PLMN 5, different MCC)
• Assisted Roaming deactivated on SIM Card
• SIM Card preparation (using SIM R/W Tool):
  • PLMN1 and PLMN2 on forbidden PLMN list (EFPMLMN)
  • All entries in EFPLMNwAcT are filled up with PLMNs not available at the test location.
  • EFLOC = PLMN5, LAI=1234, TMSI=12345678, Update Status= 00 (Updated)
• Managed Roaming System of PLMN5 (Roaming SIM) configured as follows:
  • PLMN1 = Preferred Network of the Managed Roaming System = PN
  • PLMN2, PLMN3, PLMN4 = Non-preferred Network of the Managed Roaming System = NPN

Scenario A: NMO II - CS Reject Scenario

Test procedure

Note: If LAU Request is Accepted during step 3 or 5, the test result is inconclusive and the test must be restarted from the beginning.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT.
3. DUT Starts LAU process on PLMN3 or PLMN4.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach Request</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>
4. DUT is PS attached to PLMN3 or PLMN4 (as appropriate).

5. DUT Starts LAU process on the other network (PLMN3 or PLMN4), not used in Step 3.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>RAU Request</td>
<td>RAU Reject cause #9</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>

6. DUT is PS attached to PLMN3 or PLMN4 (as appropriate).

7. DUT must now start new LAU process on an already rejected network (PLMN3 or PLMN4). During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 8. If it does not receive LAU Accept message, continue to step 10.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>RAU Request</td>
<td>RAU Reject cause #9 or RAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept (dependent on step above)</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>

[Accepted case]:
8. DUT is CS and PS attached to PLMN3 or PLMN4 (as appropriate).


[Rejected case]:
10. DUT is only PS attached to PLMN3 or PLMN4 (as appropriate).

Expected behaviour
2. DUT displays Limited Service information.
4. DUT has a suitable UI indication that PS services are available but not CS services.
6. DUT has a suitable UI indication that PS services are available but not CS services.

[Accepted case]:
8. DUT has a suitable UI indication that CS and PS services are both available.
9. MT call is successful.

[Rejected case]:
10. DUT has a suitable UI indication that PS services are available but not CS services.

Scenario B: NMO II - CS+PS Reject Scenario

Test procedure

Note: If the LAU Request is Accepted during step 3 or 4, the test result is inconclusive and the test must be restarted from the beginning.

1. Prepare SIM, Test Environment and DUT as initial configuration above.

2. Switch on DUT

3. DUT Starts LAU process on PLMN3 or PLMN4.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>
REQUEST | RESPONSE
--- | ---
PS Attach | Attach Reject #17 or #111
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
PS Attach | Attach Reject #17 or #111

Note 1: After the UE has received the fourth location update reject with Reject Cause #17 ‘Network Failure (i.e. attempt counter >=4)’ the DUT will start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point.

Note 2: Alternatively, the DUT may only start a new PLMN search after reaching the maximum attempt counter (=5) in the PS domain.

Both behaviours are compliant with the steering of roaming requirements.

Note 3: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.

4. DUT is not CS or PS attached to PLMN3 or PLMN4 (as appropriate)

5. DUT Starts LAU process on the other network (PLMN3 or PLMN4), not used in Step 3.

REQUEST | RESPONSE
--- | ---
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
LAU Request | LAU Reject cause #17
PS Attach | Attach Reject #17 or #111
PS Attach | Attach Reject #17 or #111

Note 1: After the UE has received the fourth location update reject with Reject Cause #17 ‘Network Failure (i.e. attempt counter >=4)’ the DUT will start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point.

Note 2: Alternatively, the DUT may only start a new PLMN search after reaching the maximum attempt counter (=5) in the PS domain.

Both behaviours are compliant with the steering of roaming requirements.

Note 3: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.

6. DUT is not CS or PS attached to PLMN3 or PLMN4 (as appropriate)

7. DUT must now start new LAU process on an already rejected network (PLMN3 or PLMN4). During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 8. If it does not receive LAU Accept message, continue to step 10.

REQUEST | RESPONSE
--- | ---
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
Note: In case the DUT selects the same network that was rejected in step 5 the UE will perform:
- either the remaining ATTACH procedures to reach maximum of 5 attempts. The sequential Attach cycle will restart after T3302 expiry which has default value of 12 min.
- or it will completely restart the PS attach procedure.
Both behaviours are compliant with the steering of roaming requirements.

[Accepted case]:
8. DUT is CS and PS attached to PLMN3 or PLMN4 (as appropriate).

[Rejected case]:
10. DUT is not CS or PS attached to PLMN3 or PLMN4.

Expected behaviour
2. DUT displays Limited Service information.
4. DUT has a suitable UI indication that neither CS nor PS services are available.
6. DUT has a suitable UI indication that neither CS nor PS services are available.

[Accepted case]:
8. DUT has a suitable UI indication that CS and PS services are both available.
9. MT call is successful.

[Rejected case]:
10. DUT has a suitable UI indication that neither CS nor PS services are available.

Scenario C: NMO I - Combined Reject Scenario
[To be defined]

56.1.2 Single Network Environment

Single Network Environment: This is a typical live network environment, for example, when the user is roaming in a rural location or deep indoors where no preferred visited networks are available. As testing is usually performed in cities where all networks of a country are available, such an environment is simulated by putting the preferred networks on the forbidden PLMN list on the SIM card. This excludes their selection during the network selection process.

Initial configuration
- Apply Initial Configuration for “Steering of Roaming / Rejected network not stored on Preferred PLMN list” above.
- Used SIM card: Roaming SIM Card (PLMN 5, different MCC)
- Assisted Roaming deactivated on SIM Card
- SIM Card preparation (using SIM R/W Tool):
  o PLMN1, PLMN2 and PLMN3 on forbidden PLMN list (EF_FPLMN).
  o All entries in EF_FPLMNwAct are filled up with PLMNs not available at the test location.
  o EF_LOCI = PLMN5, LAI=1234, TMSI=12345678, Update Status= 00 (Updated)
- Managed Roaming System of PLMN5 (Roaming SIM) configured as follows:
  o PLMN1 = Preferred Network of the Managed Roaming System = PN
  o PLMN2, PLMN3, PLMN4 = Non-preferred Network of the Managed Roaming System = NPN
Scenario A: NMO II - CS Reject Scenario

Test procedure

Note: If LAU Request is Accepted during step 3 the test result is inconclusive and the test must be restarted from the beginning.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT.
3. DUT Starts LAU process on PLMN4.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>

4. DUT is PS attached to PLMN4.

5. DUT must now start new LAU process on the already rejected network (PLMN4). During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 6. If it does not receive LAU Accept message, continue to step 8.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>RAU Request</td>
<td>RAU Reject cause #9 or RAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept (dependent on step above)</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>

[Accepted case]:

6. DUT is CS and PS attached to PLMN4.
7. Receive MT voice call.

[Rejected case]:

8. DUT is PS attached to PLMN4.

Expected behaviour

2. DUT displays Limited Service information.
4. DUT has a suitable UI indication that PS services are available but not CS services.

[Accepted case]:

6. DUT has a suitable UI indication that CS and PS services are both available.
7. MT call is successful.

[Rejected case]:

8. DUT has a suitable UI indication that PS services are available but not CS services.

Scenario B: NMO II - CS+PS Reject Scenario

Test procedure

Note: If LAU Request is Accepted during step 3 the test result is inconclusive and the test must be restarted from the beginning.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT.
3. DUT Starts LAU process on PLMN4.
<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 1: After the UE has received the fourth location update reject with Reject Cause #17 'Network Failure (i.e. attempt counter &gt;=4) the DUT will start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point.</td>
<td></td>
</tr>
<tr>
<td>Note 2: Alternatively, the DUT may only start a new PLMN search after reaching the maximum attempt counter (=5) in the PS domain. Both behaviours are compliant with the steering of roaming requirements.</td>
<td></td>
</tr>
<tr>
<td>Note 3: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.</td>
<td></td>
</tr>
<tr>
<td>4. DUT is not CS or PS attached to PLMN4.</td>
<td></td>
</tr>
<tr>
<td>5. DUT must now start new LAU process on the already rejected network (PLMN4). During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 6. If it does not receive LAU Accept message, continue to step 8.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: The DUT may perform:</td>
<td></td>
</tr>
<tr>
<td>- either the remaining ATTACH procedures to reach maximum of 5 attempts. The sequential Attach cycle will restart after T3302 expiry which has default value of 12 min.</td>
<td></td>
</tr>
<tr>
<td>- or it will completely restart the PS attach procedure. Both behaviours are compliant with the steering of roaming requirements.</td>
<td></td>
</tr>
</tbody>
</table>

[Accepted case] 6. DUT is CS and PS attached to PLMN4. 7. Receive MT voice call. [Rejected case] 8. DUT is not CS or PS attached to PLMN4. Expected behaviour 2. DUT displays Limited Service information. 4. DUT has a suitable UI indication that neither CS nor PS services are available. [Accepted case] 6. DUT has a suitable UI indication that CS and PS services are both available.
7. MT call is successful.

[Rejected case]

8. DUT has a suitable UI indication that neither CS nor PS services are available.

Scenario C: NMO I - Combined Reject Scenario

Test procedure

[To be defined]

56.1.3 Manual Network Selection

Manual Network Selection might be used when a user tries to select a non-preferred network manually because his preferred network was not chosen automatically. For testing purposes, the testing is carried out with the preferred network available, but this network is not used to test the Steering.

Initial configuration

- Apply Initial Configuration for “Steering of Roaming / Rejected network not stored on Preferred PLMN list” above.
- Used SIM card: Roaming SIM Card (PLMN 5, different MCC)
- Assisted Roaming deactivated on SIM Card
- SIM Card preparation (using SIM R/W Tool):
  - All entries in EFPLMNwAcT are filled up with PLMNs not available at the test location.
  - EF_LOC = PLMN1, LAI=1234, TMSI=12345678, Update Status= 00 (Updated)
- Managed Roaming System of PLMN5 (Roaming SIM) configured as follows:
  - PLMN1 = Preferred Network of the Managed Roaming System = PN
  - PLMN2, PLMN3, PLMN4 = Non-preferred Network of the Managed Roaming System = NPN

Scenario A: NMO II - CS Reject Scenario

Test procedure

Note: If LAU Request is Accepted during step 4 the test result is inconclusive and the test must be restarted from the beginning or the test environment needs to be checked for suitability.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT.
3. Perform network scan.
4. Manually select PLMN3. DUT Starts LAU process on PLMN3.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>

5. DUT is PS attached to PLMN3.

6. Manually select PLMN3 again. DUT Starts LAU process on PLMN3. During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 7. If it does not receive LAU Accept message, continue to step 9.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>
### REQUEST RESPONSE

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>

[Accepted case]
7. DUT is CS and PS attached to PLMN3.
8. Receive MT voice call.

[Rejected case]
9. DUT is PS attached to PLMN3.

**Expected behaviour**
2. DUT is CS and PS attached to PLMN1.
5. DUT has a suitable UI indication that PS services are available but not CS services. No attempt is made by the DUT to change to another network.

[Accepted case]
7. DUT has a suitable UI indication that CS and PS services are both available.
8. MT call is successful.

[Rejected case]
9. DUT has a suitable UI indication that PS services are available but not CS services.

**Scenario B: NMO II - CS+PS Reject Scenario**

**Test procedure**

Note: If LAU Request is Accepted during step 4 the test result is inconclusive and the test must be restarted from the beginning or the test environment needs to be checked for suitability.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT.
3. Perform network scan.
4. Manually select PLMN3. DUT Starts LAU process on PLMN3.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111</td>
</tr>
</tbody>
</table>

Note 1: The 5th Attach attempt is optional. The DUT may stop after the 4th unsuccessful LAU procedure.

Note 2: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.

5. DUT is not CS or PS attached to PLMN3.
6. Manually select PLMN3 again. DUT Starts LAU process on PLMN3. During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 7. If it does not receive LAU Accept message, continue to step 9.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>REQUEST</td>
<td>RESPONSE</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or #111 or Attach Accept</td>
</tr>
</tbody>
</table>

Note: The DUT may perform:
- either the remaining ATTACH procedures to reach maximum of 5 attempts. A new attach cycle will restart after T3302 expiry which has a default value of 12 min.
- or it will completely restart the PS attach procedure. The 5th Attach attempt is optional. The DUT may stop after the 4th unsuccessful LAU procedure.

Both behaviours are compliant with the steering of roaming requirements.

[Accepted case]:
7. DUT is CS and PS attached to PLMN3.
8. Receive MT voice call.

[Rejected case]:
9. DUT is not CS or PS attached to PLMN3.

Expected behaviour
2. DUT is CS and PS attached to PLMN1.
5. DUT has a suitable UI indication that neither CS nor PS services are available. No attempt is made by the DUT to change to another network.

[Accepted case]:
7. DUT has a suitable UI indication that CS and PS services are both available.
8. MT call is successful.

[Rejected case]:
9. DUT has a suitable UI indication that neither CS nor PS services are available.

Scenario C: NMO I - Combined Reject Scenario

Test procedure
[To be defined]

56.2 Steering of Roaming / Rejected network stored on Preferred PLMN list (EF\textsubscript{PLMNwAcT})

The following items are common to all tests with regards to “Steering of Roaming / Rejected network stored on Preferred PLMN list (EF\textsubscript{PLMNwAcT})” and will therefore not be mentioned again in the individual test case descriptions.

Description
The UE shall be able to perform automatic and manual network selection when Steering of Roaming is applied and when the rejected network is stored on Preferred PLMN list (EF\textsubscript{PLMNwAcT}) and return consistent display messages to the user.

Related 3GPP core specifications
TS 24.008, sub clause 4.2.1.2
Reason for test
To ensure that the DUT is performing a new PLMN search when Rejected network is stored on the Preferred PLMN list, and not waiting for T3212 to expire when Steering of Roaming is applied.

Initial configuration
- DUT switched off, with following configuration:
  - Automatic network selection mode
  - GPRS Attach at power on enabled
  - W-CDMA or GSM only Mode selected
  - PDP context activation at Power ON is disabled.
  - Backlight set to maximum setting (optional)
- Test to happen in live network
- Test to happen in Static test location
- Networks available:
  - PLMN1: Preferred network
  - PLMN2: Non-preferred network
  - PLMN3: Non-preferred network
  - PLMN4: Non-preferred network

56.2.1 Multi Network Environment
Multiple Network Environments: This is a typical live network environment, for example, when the user switches-on his device in places such as airports, where several mobile networks are available. One or more of them are preferred and a location update is immediately successful. One or more of the networks are not preferred and location update attempts on these networks will be rejected several times as described above.

Initial configuration
- Apply Initial Configuration for “Steering of Roaming / Rejected network stored on Preferred PLMN list” above.
- Used SIM card: Roaming SIM Card (PLMN 5, different MCC)
- Assisted Roaming deactivated on SIM Card
- SIM Card preparation (using SIM R/W Tool):
  - PLMN1 and PLMN2 on forbidden PLMN list (EF_FPLMN)
  - PLMN3 is stored at highest priority of EF_PLMNwAcT
  - Remaining entries in EF_PLMNwAcT are filled up with PLMNs not available at the test location.
  - EF_LOCI = PLMN5, LAI=1234, TMSI=12345678, Update Status= 00 (Updated)
- Managed Roaming System of PLMN5 (Roaming SIM) configured as follows:
  - PLMN1 = Preferred Network of the Managed Roaming System = PN
  - PLMN2, PLMN3, PLMN4 = Non-preferred Network of the Managed Roaming System = NPN

Scenario A: NMO II - CS Reject Scenario
Test procedure
Note: If LAU Request is Accepted during step 3 or 5, the test result is inconclusive and the test must be restarted from the beginning.

1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT,
3. DUT Starts LAU process on PLMN3

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>

4. DUT is PS attached to PLMN3.

5. DUT Starts LAU process on the other network PLMN4

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>RAU Request</td>
<td>RAU Reject cause #9</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
</tbody>
</table>

6. DUT is PS attached to PLMN4.

7. DUT must now start new LAU process on an already rejected network (PLMN3 or PLMN4). During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 8. If it does not receive LAU Accept message, continue to step 10.

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>RAU Request</td>
<td>RAU Reject cause #9 or RAU Accept</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Accept (dependent on step above)</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>

[Accepted case]:

8. DUT is CS and PS attached to PLMN3 or PLMN4 (as appropriate).


[Rejected case]:

10. DUT is PS attached to PLMN3 or PLMN4 (as appropriate).

Expected behaviour

2. DUT displays Limited Service information.

4. DUT has a suitable UI indication that PS services are available but not CS services.

6. DUT has a suitable UI indication that PS services are available but not CS services.

[Accepted case]:

8. DUT has a suitable UI indication that CS and PS services are both available.

9. MT call is successful.

[Rejected case]:

10. DUT has a suitable UI indication that PS services are available but not CS services.

Scenario B: NMO II - CS+PS Reject Scenario

Test procedure

Note: If LAU Request is Accepted during step 3 or 5, the test result is inconclusive and the test must be restarted from the beginning.
1. Prepare SIM, Test Environment and DUT as initial configuration above.
2. Switch on DUT,
3. DUT Starts LAU process on PLMN3

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
</tbody>
</table>

Note 1: After the UE has received the fourth location update reject with Reject Cause #17 'Network Failure (i.e. attempt counter >=4) the DUT will start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point.

Note 2: Alternatively, the DUT may only start a new PLMN search after reaching the maximum attempt counter (=5) in the PS domain.
Both behaviours are compliant with the steering of roaming requirements

Note 3: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.

4. DUT is not CS or PS attached to PLMN3.
5. DUT Starts LAU process on the other network PLMN4

<table>
<thead>
<tr>
<th>REQUEST</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111</td>
</tr>
</tbody>
</table>

Note 1: After the UE has received the fourth location update reject with Reject Cause #17 'Network Failure (i.e. attempt counter >=4) the DUT will start a new PLMN search according to 3GPP TS 24.008 section 4.2.1.2, last bullet point.

Note 2: Alternatively, the DUT may only start a new PLMN search after reaching the maximum attempt counter (=5) in the PS domain.
Both behaviours are compliant with the steering of roaming requirements

Note 3: In response to the first Attach Reject #111, the DUT may set the maximum attempt counter (=5) in the PS domain.

6. DUT is not CS or PS attached to PLMN4.
7. DUT must now start new LAU process on an already rejected network PLMN3 or PLMN4. During this process, the DUT can receive LAU Accept message at any point. If it does this, continue to step 8. If it does not receive LAU Accept message, continue to step 10.

<table>
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<tr>
<th>REQUEST</th>
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<tbody>
<tr>
<td>LAU Request</td>
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</tr>
<tr>
<td>PS Attach</td>
<td>Attach Reject #17 or 111 or Attach Accept</td>
</tr>
<tr>
<td>LAU Request</td>
<td>LAU Reject cause #17 or LAU Accept</td>
</tr>
</tbody>
</table>
REQUEST | RESPONSE
---|---
PS Attach | Attach Reject #17 or #111 or Attach Accept
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
LAU Request | LAU Reject cause #17 or LAU Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept
PS Attach | Attach Reject #17 or #111 or Attach Accept

Note: In case the DUT selects the same network that was rejected in step 5 the UE will perform:
- either the remaining ATTACH procedures to reach maximum of 5 attempts. The sequential Attach cycle will restart after T3302 expiry which has default value of 12 min.
- or it will completely restart the PS attach procedure.
Both behaviours are compliant with the steering of roaming requirements.

[Accepted case]:
8. DUT is CS and PS attached to PLMN3 or PLMN4 (as appropriate).

[Rejected case]:
10. DUT is not CS or PS attached to PLMN3 or PLMN4 (as appropriate).

Expected behaviour
2. DUT displays Limited Service information.
4. DUT has a suitable UI indication that neither CS nor PS services are available.
6. DUT has a suitable UI indication that neither CS nor PS services are available.

[Accepted case]:
8. DUT has a suitable UI indication that CS and PS services are both available.
9. MT call is successful.

[Rejected case]:
10. DUT has a suitable UI indication that neither CS nor PS services are available.

Scenario C: NMO I - Combined Reject Scenario
Test procedure
[To be defined]

57 (U)ICC with SIM and USIM

57.1 General (U)ICC with SIM and USIM test cases

57.1.1 PIN Handling

57.1.1.1 Change of PIN
Description
Procedure for changing PIN
Related core specifications
TS 22.030 sub clauses 6.6.2, TS 31.102, ETSI TS 102 221.
Reason for test
To ensure that PIN can be changed

Initial configuration
DUT is in idle mode, PIN is enabled
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
1. Dial the code "+04*OLD*NEW*NEW#" (where OLD is the old PIN and NEW is the new PIN) to change PIN.
2. Switch the DUT off and on and when PIN code is requested enter the new PIN code

Scenario B:
Repeat step 1 & 2 under Scenario A, but using the phone's menus to send the command.

Expected behaviour
For both scenarios:
1. Check that the new PIN is accepted by the mobile and an indication is given showing whether this procedure was successful
2. New PIN code is accepted and DUT is going to idle mode.

57.1.1.2 Change of PIN, wrong repeating of new PIN

Description
Failure of PIN change when new PIN is repeated incorrectly

Related core specifications
3GPP TS 22.030 sub clauses 6.6.2, 3GPP TS 31.102, ETSI TS 102 221.

Reason for test
To ensure that PIN change fails when the new PIN is not entered the same twice

Initial configuration
DUT is in idle mode, PIN is enabled
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
Dial the code **04*OLD*NEW1*NEW2# (where OLD is the old PIN and NEW1 and NEW2 are different from each other) to change PIN. Check that the mobile indicates that the command has failed.

Scenario B:
Repeat Scenario A, but using the phone's menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed.
57.1.1.3 Change of PIN, old PIN wrong

Description
Failure of PIN change when old PIN is entered incorrectly

Related core specifications
3GPP TS 22.030 sub clause 6.6.2

Reason for test
To ensure that PIN change fails when the old PIN is entered incorrectly

Initial configuration
DUT is in idle mode, PIN is enabled

Test procedure
Scenario A:
Dial the code **04*OLD*NEW*NEW# (where OLD is an incorrectly entered old PIN and NEW is the new PIN) to change PIN. Check that the mobile indicates that the command has failed, giving the reason.

Scenario B:
Repeat Scenario A, but using the phone’s menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed.

57.1.1.4 Change of PIN, new PIN wrong (3 digits long)

Description
Failure of PIN change when new PIN is only 3 digits long

Related core specifications
3GPP TS 22.030 sub clause 6.6.2

Reason for test
To ensure that PIN change fails when the new PIN is only 3 digits long

Initial configuration
DUT is in idle mode, PIN is enabled

Test procedure
Scenario A:
Dial the code **04*OLD*NEW*NEW# (where OLD is the old PIN and NEW is the new 3-digit PIN) to change the PIN. Check that the mobile indicates that the command has failed, giving the reason.

Scenario B:
Repeat Scenario A, but using the phone’s menu.

**Expected behaviour**
In both scenarios the mobile clearly indicates that the command has failed

### 57.1.1.5 Deactivation of PIN

**Description**
Procedure for deactivating PIN

**Related core specifications**
3GPP TS 31.102

**Reason for test**
To ensure that PIN can be deactivated

**Initial configuration**
DUT in idle mode. PIN enabled

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**
1. Deactivate PIN using the UE’s menu. Check that PIN has been deactivated.
2. Switch the DUT off and on. No request for PIN code should appear.

**Expected behaviour**
1. PIN is deactivated.
2. DUT goes straight to idle mode.

### 57.1.1.6 Change of PIN, when deactivated

**Description**
Procedure for changing PIN when deactivated

**Related core specifications**
3GPP TS 22.030 sub clause 6.6.2, 3GPP TS 31.102, ETSI TS 102 221 sub clause 14.2.3 for UICC.

**Reason for test**
To ensure that the device does not crash when the user tries to change PIN when deactivated

**Initial configuration**
DUT in idle mode. PIN deactivated

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

**Scenario A:**
Dial the code **04#**OLD**NEW**NEW# (where OLD is the old PIN and NEW is the new PIN) to change PIN.
Scenario B:
Repeat scenario A, but using the phone’s menus to send the command.

Expected behaviour
PIN can normally not be changed when deactivated. Therefore the following behaviour could occur when the test procedure is performed:
An appropriate error message indicates to the user that PIN cannot be changed when deactivated
One of the following two possible behaviours can be expected:
1. The menu for changing PIN is disabled
2. An appropriate error message indicates to the user that PIN cannot be changed while deactivated
In all cases the device does not crash and PIN is unchanged.

57.1.1.7 Activation of PIN
Description
Procedure for activating PIN
Related core specifications
3GPP TS 31.102
GSM 11.11
Reason for test
• To ensure that PIN can be activated.
• PIN can be accepted using the #-key.

Initial configuration
DUT in idle mode. PIN deactivated
Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
1. Activate PIN using the phone’s menu.
2. Check that PIN has been activated by switching the phone off and on, enter PIN followed by either “#” (if supported) or soft key.

Expected behaviour
1. PIN is activated.
2. PIN is accepted.

57.1.1.8 Change of PIN, when blocked
Description
Failure of PIN change procedure when PIN is blocked
Related core specifications
3GPP TS 22.030 sub clause 6.6.3, 3GPP TS 31.102
Reason for test
To ensure that PIN cannot be changed when PIN is blocked
Initial configuration
DUT in idle mode. PIN activated and blocked (Entering 3x wrong PIN code)
PUK code available.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
Dial the code **04*OLD*NEW*NEW# to change the PIN. Check that the mobile indicates that the command has failed, giving the reason.

Scenario B:
Repeat scenario A, but using the phone’s menu

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed, giving the reason.

57.1.1.9 Unblocking of blocked PIN

Description
Procedure for unblocking PIN

Related core specifications
3GPP TS 22.030 sub clause 6.6.3, 3GPP TS 31.102, ETSI TS 102 221

Reason for test
To ensure that PIN unblocking procedure is performed correctly.

Initial configuration
DUT in idle mode. PIN activated and blocked (Entering 3x wrong PIN code)
PUK code available.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
1. With PIN blocked, dial the code **05*PUK*NEW*NEW# (where PUK is the pin unblocking key and NEW is a new value for the PIN) to unblock the PIN and enter a new PIN.
2. Switch the DUT off and on and when PIN code is requested enter the new PIN code

Scenario B:
Repeat step 1 & 2 under Scenario A, but using the phone's menus to send the command

Expected behaviour
For both scenarios:
1. Check that the new PIN is accepted by the mobile and that it’s obvious to the user that the procedure was successful
2. New PIN code is accepted and DUT is going to idle mode.

57.1.2 PIN2 handling

57.1.2.1 Change of PIN2

Description
Procedure for changing PIN2

Related core specifications
3GPP TS 22.030 sub clauses 6.6.2, 3GPP TS 31.102, ETSI TS 102 221.

Reason for test
To ensure that PIN2 can be changed

Initial configuration
DUT is in idle mode and PIN2 enabled
PIN2 is supported by card

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure

Scenario A:
1. Dial the code **042*OLD*NEW*NEW# to change PIN2. Check that the new PIN2 is accepted by the mobile.
2. Go to a data field which is protected by PIN2 on UICC, for e.g. FDN and enter the new PIN2 code.

Scenario B:
Repeat step 1 & 2 under Scenario A, but using the phone's menus to send the command.

Expected behaviour
For both scenarios:
1. Check that the new PIN2 is accepted by the mobile and an indication is given showing whether this procedure was successful
2. New PIN2 code is accepted and access to for e.g. FDN is enabled.

57.1.2.2 Change of PIN2, wrong repeating of new PIN2

Description
Failure of PIN2 change when new PIN2 is repeated incorrectly

Related core specifications
3GPP TS 22.030 sub clauses 6.6.2, 3GPP TS 31.102, ETSI TS 102 221.

Reason for test
To ensure that PIN2 change fails when the new PIN2 is not entered the same twice

Initial configuration
DUT is in idle mode, PIN2 is enabled
PIN2 is supported by card

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure

Scenario A:
Dial the code **042*OLD*NEW1*NEW2# (where OLD is the old PIN2 and NEW1 and NEW2 are different from each other) to change PIN2.

Scenario B:
Repeat Scenario A, but using the phone’s menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed.

57.1.2.3 Change of PIN2, old PIN2 wrong

Description
Failure of PIN2 change when old PIN is entered incorrectly

Related core specifications
3GPP TS 22.030 sub clause 6.6.2

Reason for test
To ensure that PIN2 change fails when the old PIN2 is entered incorrectly

Initial configuration
DUT is in idle mode, PIN2 is enabled
PIN2 is supported by card
Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure

Scenario A:
Dial the code **042*OLD*NEW1*NEW2# (where OLD is an incorrectly entered old PIN2 and NEW is the new PIN2) to change PIN2. Check that the mobile indicates that the command has failed, giving the reason

Scenario B:
Repeat Scenario A, but using the phone’s menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed

57.1.2.4 Change of PIN2, new PIN2 wrong (3 digits long)

Description
Failure of PIN2 change when new PIN2 is only 3 digits long

Related core specifications
3GPP TS 22.030 sub clause 6.6.2
Reason for test
To ensure that PIN2 change fails when the new PIN2 is only 3 digits long

Initial configuration
DUT is in idle mode, PIN2 is enabled
PIN2 is supported by card
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
Dial the code **042*OLD*NEW*NEW# (where OLD is the old PIN2 and NEW is the new 3-digit PIN2) to change the PIN. Check that the mobile indicates that the command has failed, giving the reason.

Scenario B:
Repeat Scenario A, but using the phone's menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed

57.1.2.5 Change of PIN2, when blocked

Description
Failure of PIN2 change procedure when PIN2 is blocked

Related core specifications
3GPP TS 22.030 sub clause 6.6.3, 3GPP TS 31.102

Reason for test
To ensure that PIN2 cannot be changed when PIN2 is blocked

Initial configuration
DUT in idle mode. PIN2 activated and blocked (entering 3x wrong PIN2 code).
PIN2 is supported by card
PUK2 code available
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Scenario A:
Dial the code **042*OLD*NEW*NEW# to change the PIN2. Check that the mobile indicates that the command has failed, giving the reason.

Scenario B:
Repeat Scenario A, but using the phone's menu.

Expected behaviour
In both scenarios the mobile clearly indicates that the command has failed, giving the reason.
57.1.2.6 Unblocking of blocked PIN2

Description
Procedure for unblocking PIN2

Related core specifications
3GPP TS 22.030 sub clause 6.6.3, 3GPP TS 31.102, ETSI TS 102 221

Reason for test
To ensure that PIN2 unblocking procedure is performed correctly.

Initial configuration
DUT in idle mode. PIN2 activated and blocked (Entering 3x wrong PIN2 code)
PIN2 is supported by card
PUK2 code available

Where possible, use as many of the following types:

• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Scenario A:
1. With PIN2 blocked, dial the code **052*PUK*NEW*NEW# (where PUK2 is the pin unblocking key and NEW is a new value for the PIN2) to unblock the PIN2 and enter a new PIN2.
2. Go to a data field which is protected by PIN2 on UICC, for e.g. FDN and enter the new PIN2 code.

Scenario B:
Repeat step 1 & 2 under Scenario A, but using the phone's menus to send the command

Expected behaviour
For both scenarios:
1. Check that the new PIN2 is accepted by the mobile and that it's obvious to the user that the procedure was successful
2. New PIN2 code is accepted and access to for e.g. FDN is enabled.

57.1.3 Fixed Dialling Number (FDN)

57.1.3.1 Enabling, Updating and Disabling Of FDN

Description
Procedure for Enabling, Updating and Disabling Of FDN

Related core specifications
3GPP TS 22.030 sub clause 6.6.2, TS 31.102, ETSI TS 102 221
GSM 11.11 sub clause 11.5.1
GSM 02.07 sub clause B.3.2

Reason for test
To verify that editing of the FDN list is only possible under the control of PIN2 and when updated, the DUT correctly updates the EF_{FDN} data field in the USIM.
Initial configuration

DUT pre-test condition: FDN deactivated

No call barring services activated

Where supported and possible, there should be no entries stored in the ADN, SDN, BDN or LND lists.

PIN2 is supported by card

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure

1. Select FDN option, verify PIN2, store an entry in the FDN[1] field, and enable FDN. Recall and send the FDN number.
2. Attempt to establish a call to the number in added in step 1 above, but key the number directly.
3. Select FDN option, verify PIN2 and delete the entry in FDN[1].
4. Attempt to establish a call to the number formerly added in FDN[1].
5. Select FDN option, verify PIN2 and enter a different entry in FDN[1].
6. Attempt to establish a call to the number in step 1 above.
7. Using a SIM card reader, verify the contents of the EF FDN data field in the USIM.
8. Select FDN option, verify PIN2 and delete all FDN entries. Enter a name only in FDN[1] using a SIM card reader. Attempt to establish a call to any valid number other than an emergency number.
9. Select FDN option, verify PIN2 and deactivate FDN.
10. Attempt to establish a call to any valid number other than an emergency number or either of the numbers in step 1 and 5 above.

Expected behaviour

1. The DUT allows call set up.
2. The DUT allows call set up.
3. Entry is deleted.
4. The DUT does not permit the call to be made.
5. New FDN entry is accepted.
6. The DUT prevents call set up.
7. EF FDN data field should be empty.
8. The DUT prevents call set up.
9. FDN is deactivated.
10. The DUT allows call set up.

57.1.3.2 Correct Operation of FDN

Description

Procedure to check correct operation of FDN

Related core specifications

3GPP TS 22.030 sub clause 6.6.2, TS 31.102, ETSI TS 102 221
GSM 11.11 sub clause 11.5.1
GSM Association
Official Document TS.11

GSM 02.07 sub clause B.3.2

Reason for test
To verify that the numbers in the FDN list only can be used when the option is active.

Initial configuration
FDN deactivated
PIN2 is supported by card

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Establish a non-FDN call then clear it.
2. Set the following conditions and attempt to establish a call for each condition:
   a. a number is stored in the ADN list
   b. a number is stored in the last number dialled list
   c. a number is stored in the missed call list
   d. a short message is stored which contains a directory number which can be extracted from the message.
3. Select the FDN option, verify PIN2, enable FDN and enter a valid number in FDN[1], where FDN[1] is not one of the numbers used in step 1 or 2 above i.e. ADN, LND, Missed Call List and SMS number. Check that the DUT indicates that FDN is active.
4. Power DUT off then on.
5. Attempt to establish a call to the numbers used in step 1 or 2 above. Check that the DUT prevents the calls from being set up.
6. Access the FDN option, deactivate FDN and set up a call to the numbers used in step 1 or 2 above. Check that the DUT permits the calls to be set up.

Expected behaviour
Only numbers in the FDN list can be used when FDN is active.

57.1.3.3 FDN Activated - user modifications

Description
Procedure to check user modifications of FDN

Related core specifications
3GPP TS 22.030 sub clause 6.6.2, TS 31.102, ETSI TS 102 221
GSM 11.11 sub clause 11.5.1
GSM 02.07 sub clause B.3.2

Reason for test
To test that the built in flexibility of the FDN function can be exercised by the user when the FDN list is activated. This flexibility, where supported, includes use of wild characters and extensions to numbers.

Initial configuration
FDN enabled
PIN2 is supported by card

Where possible, use as many of the following types:
The following FDN entries are stored:

- **FDN[1]** 01XXXXXX2
- **FDN[2]** 01XXXXXDXXX
- **FDN[3]** 01XXXXXXXXXP0123 (pause FDN)

D - wild character  
X - any number  
P - pause function

**Test procedure**

1. Enter 01XXXXXX2, add a 2 digit extension number, attempt call set up. The DUT shall allow call set up.
2. Enter 01XXXXXX3, add a 2 digit extension number, attempt call set up, where 01XXXXXX3 <> FDN[2]. The DUT shall prevent call set up.
3. Select FDN [2], enter 5 for the wild character, attempt call set up. The DUT shall allow call set up.
4. Select FDN [3], attempt call set up. The DUT shall allow call set up.
5. Enter 01XXXXXXXXXP1234 and attempt call set up. The DUT shall prevent call set up.

**Expected behaviour**

Only numbers in the FDN list (including wildcards) can be used when FDN is active.

### 57.1.3.4 Operation of FDN with Supplementary Service

**Description**

Procedure to check operation of FDN with Supplementary Services

**Related core specifications**

- 3GPP TS 22.030 sub clause 6.6.2, TS 31.102, ETSI TS 102 221
- GSM 11.11 sub clause 11.5.1
- GSM 02.07 sub clause B.3.2

**Reason for test**

To test that, when FDN is activated, supplementary services can only be activated/deactivated when they are in the FDN list.

**Initial configuration**

- FDN activated and list empty
- All supplementary services deactivated
- PIN2 is supported by card

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Select FDN option, verify PIN2 and enter the following FDN entries:
   a. FDN [1] **21*+XX..X#  X - digits of the international number
   b. FDN [2] *#21#
   c. FDN [3] ##21#
2. Switch the Mobile off and on again (Power Cycle)
3. Select FDN[1] and attempt set up of SS. The SS shall be activated and the DUT shall indicate the activation
4. Select FDN[2] to check status of SS. The DUT shall correctly indicate the SS status
5. Set up a call to the UE. Check that the DUT does not indicate the incoming call. The call shall be established to the international number.
6. Select FDN [3].
7. Set up a call to the UE. Check that the DUT indicates the incoming call
8. Enter a SS code other than CFU and attempt to activate service. Check that the DUT does not permit the service to be activated.
9. Repeat step 7 using the DUT menu options where available.

Expected behaviour
Only SS codes in the FDN list can be used when FDN is active.

57.1.3.5 Operation of FDN with SMS-MO

Description
Procedure to check operation of FDN with SMS-MO

Related core specifications
3GPP TS 22.030 sub clause 6.6.2, TS 31.102, ETSI TS 102 221
GSM 11.11 sub clause 11.5.1
GSM 02.07 sub clause B.3.2

Reason for test
To test that, when FDN is activated, SMS-MO can only be sent when the destination number is in the FDN list.

Initial configuration
FDN activated and list empty
PIN2 is supported by card

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Select FDN option, verify PIN2 and enter the SMS-MO destination number in the FDN [1] entry:
2. Write a short message and send it to the destination number stored in FDN[1]. The SM shall be sent.
3. Write a short message and send it to a destination number not stored in FDN. The SM shall not be sent and an error message shall be displayed giving the reason.

Expected behaviour
1. -
2. The short message shall be sent successfully.
3. The short message shall not be sent. A proper message shall be displayed showing the reason.
57.1.3.6 Operation of FDN with GPRS

Description
Procedure to check operation of FDN with GPRS

Related GSM core specifications
GSM 11.11 sub clause 11.5.1
GSM 02.07 sub clause B.3.2

Reason for test
To test that, when FDN is activated, GPRS shall only be activated when the SS-code *99# is in the FDN list.

Initial configuration
FDN activated and list empty
PIN2 is supported by card

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. A PDP context shall be attempted. Activation shall be prevented and a message shall be displayed giving the reason.
2. Select FDN option, verify PIN2 and enter *99# in the FDN [1] entry.
3. A PDP context shall be successfully attempted.

Expected behaviour
1. The PDP context shall not be activated and a message shall be displayed giving the reason.
2. The PDP context shall be activated.

57.1.3.7 Operation of FDN with WAP via CSD

Description
Procedure to check operation of FDN with WAP via CSD

Related GSM core specifications
GSM 11.11 sub clause 11.5.1
GSM 02.07 sub clause B.3.2

Reason for test
To test that, when FDN is activated, WAP via CSD shall only be activated when the gateway access number is in the FDN list.

Initial configuration
FDN activated and list empty
PIN2 is supported by card

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM
**Test procedure**

1. A WAP session shall be attempted. This shall be prevented and a message shall be displayed giving the reason.
2. Select FDN option, verify PIN2 and enter the WAP gateway access number in the FDN [1] entry.
3. A WAP session shall be attempted.

**Expected behaviour**

1. The WAP session shall not be activated and a message shall be displayed giving the reason.
3. The WAP session shall be activated successfully.

### 57.1.4 Removal and replace of SIM, UICC or USIM

#### 57.1.4.1 Remove SIM, UICC or USIM during a call

**Description**

The call should be cleared in a correct manner after removal of the UICC

**Related core specifications**

3GPP TS 31.102, 3GPP TS 24.008 (sub clause 5.1.9), ETSI TS 102 221.

**Reason for test**

To ensure a DUT identifies the removal of a SIM, UICC or USIM during a call.

**Initial configuration**

DUT has an active call

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Without powering down the UE, remove the UICC.
2. Ensure that the call is cleared within 35 seconds. Check that IMSI detach is performed by monitoring the radio signals.
3. Check that no calls, SMS, or supplementary services can be operated after the call is cleared.

**Expected behaviour**

1. -
2. The call is cleared within 35 seconds. IMSI detach is performed.
3. No calls, SMS, or supplementary services, except for emergency call attempt (When allowed to initiate an EM call without SIM/UICC), can be operated after the call is cleared.

### 57.1.4.2 Remove/Replace UICC during idle mode

**Description**

The DUT should behave in a correct way after removal of the UICC

**Related core specifications**

3GPP TS 31.102, ETSI TS 102 221.
Reason for test
To ensure that when the UICC is changed while the DUT is in idle mode, the DUT recognises and uses the new SIM for subsequent calls.

Initial configuration
DUT is in idle mode

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Without powering down the mobile, remove the UICC. If necessary a charger or external power supply should be used. Check that no calls can be made except for emergency call attempts. (When allowed to initiate an EM call without SIM/UICC)

2. After replacing the UICC with another UICC an outgoing call to another mobile is performed. It is checked that the called mobile displays the Directory Number associated with the new UICC. (Where possible, this test should be carried out on a network which does not implement authentication on all calls.)

3. While in idle mode, and without powering down the mobile, remove the UICC and replace it with another UICC. Arrange for an incoming call to be made to the Directory Number of the “old” UICC.

Expected behaviour
1. No calls, SMS, or supplementary services, except for emergency call attempt (when permitted), can be made.

2. Call is established and the correct number is displayed.

3. The DUT should not respond to the call.

57.1.5 Support of SMSP (Short Message Service Parameter)

57.1.5.1 Read SMSP

Description
Procedure for testing support of Short message service parameters already stored on the ICC.

Related 3GPP/ETSI core specifications
3GPP TS 31.102, ETSI TS 102 221

Reason for test
To ensure that a DUT supports the elementary file EF_SMSP (Short message service parameters) and read them correctly.

Initial configuration
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

The ICC has to support the following elementary files:

- EF_SMSP (Short message service parameters)
If an UICC with USIM is used, the EF\textsubscript{UST} (USIM Service Table) must indicate that service n°12 (Short Message Service Parameters (SMSP)) is available. If a service is not indicated as available in the USIM, the ME shall not select this service.

One mobile subscriptions with the telephone number <MSISDN #1> is required to send and receive short messages.

Using an external card reader, EF\textsubscript{SMSP} is initialised with the following values:

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to Y</td>
<td>&lt;Alpha-Identifier&gt; Y bytes</td>
<td></td>
</tr>
<tr>
<td>Y+1</td>
<td>= 'FD' hex = 11111101 binary = “TP-Destination Address” absent.</td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>“TS-Service Centre Address” present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Protocol Identifier” absent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Data Coding Scheme” absent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Validity Period” absent</td>
<td></td>
</tr>
<tr>
<td>Y+2 to Y+13</td>
<td>&lt;MSISDN #2&gt; 12 bytes</td>
<td></td>
</tr>
<tr>
<td>Y+14 to Y+25</td>
<td>&lt;Service Centre Address&gt; = Any valid service centre address for the service provider of the smartcard.</td>
<td>12 bytes</td>
</tr>
<tr>
<td>Y+26</td>
<td>&lt;Any Protocol Identifier&gt; 1 byte</td>
<td></td>
</tr>
<tr>
<td>Y+27</td>
<td>&lt;Any Data Coding Scheme&gt; 1 byte</td>
<td></td>
</tr>
<tr>
<td>Y+28</td>
<td>&lt;Any Validity Period&gt; 1 byte</td>
<td></td>
</tr>
</tbody>
</table>

A second smartcard (ICC or UICC) is required for test preparation (Step 1).

**Test procedure**

1. The DUT is connected with a second smartcard and the DUT switched on. The Service Centre Address is changed via Menu to any non-valid value, different from <Service Centre Address>.
2. The DUT is switched off and the second smartcard is removed. The first UICC (with USIM) is connected to the DUT and the DUT switched on. The Service Centre Address stored by the DUT is checked via Menu.
3. A new mobile originated SMS is created and sent to MSISDN #1. The DUT asks for the destination MSISDN.
4. The DUT is switched off and the UICC is removed from the UE. The value of EF\textsubscript{SMSP} is checked with an external card reader.

**Expected behaviour**

1. The DUT indicates that the new Service Centre Address is saved.
2. The DUT indicates that <Service Centre Address> is the service centre address.
3. The DUT indicates that the mobile originated SMS is sent successfully. The DUT prompted to enter the MSISDN and does not present MSISDN #2 as the proposed destination. The SMS is received at MSISDN #1.
4. The values of EF\textsubscript{SMSP} is as defined during initialisation.

**57.1.5.2 Write SMSP (e.g. check correct storing of SMSP parameters)**

**Description**

Procedure for testing support of storing Short message service parameters on the ICC.

**Related 3GPP/ETSI core specifications**

3GPP TS 31.102, ETSI TS 102 221

**Reason for test**

To ensure that a DUT supports storing of SMS service parameters on the elementary file EF\textsubscript{SMSP} (Short message service parameters).
Initial configuration

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

The ICC has to support the following elementary files:

- \( \text{EF}_{\text{SMSP}} \) (Short message service parameters)

If an UICC with USIM is used, the \( \text{EF}_{\text{UST}} \) (USIM Service Table) must indicate that service n°12 (Short Message Service Parameters (SMSP)) is available. If a service is not indicated as available in the USIM, the ME shall not select this service.

One mobile subscription with the telephone number \(<\text{MSISDN #1}>\) is required to send and receive short messages.

Using an external card reader, \( \text{EF}_{\text{SMSP}} \) is initialised with the following values:

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to ( Y )</td>
<td>(&lt;\text{Alpha-Identifier}&gt;)</td>
<td>( Y ) bytes</td>
</tr>
<tr>
<td>( Y+1 )</td>
<td>= ‘FD’ hex = ‘11111101’ binary = ( \text{TP-Destination Address} ) absent. ( \text{TS-Service Centre Address} ) present ( \text{TP-Protocol Identifier} ) absent ( \text{TP-Data Coding Scheme} ) absent ( \text{TP-Validity Period} ) absent</td>
<td>1 byte</td>
</tr>
<tr>
<td>( Y+2 ) to ( Y+13 )</td>
<td>(&lt;\text{MSISDN #2}&gt;)</td>
<td>12 bytes</td>
</tr>
<tr>
<td>( Y+14 ) to ( Y+25 )</td>
<td>(&lt;\text{Wrong Service Centre Address}&gt;) = any non-valid service centre address for the service provider of the UICC.</td>
<td>12 bytes</td>
</tr>
<tr>
<td>( Y+26 )</td>
<td>(&lt;\text{Any Protocol Identifier}&gt;)</td>
<td>1 byte</td>
</tr>
<tr>
<td>( Y+27 )</td>
<td>(&lt;\text{Any Data Coding Scheme}&gt;)</td>
<td>1 byte</td>
</tr>
<tr>
<td>( Y+28 )</td>
<td>(&lt;\text{Any Validity Period}&gt;)</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

\(<\text{Service Centre Address}>\) is a valid service centre address for the service provider of the ICC.

Test procedure

1) The ICC is connected to the DUT and the DUT switched on. Via Menu the service centre address is changed to \(<\text{Service Centre Address}>\).

2) A new mobile originated SMS is created and sent to MSISDN #1. The DUT asks for the destination MSISDN.

3) The DUT is switched off and the ICC is removed from the UE. The value of \( \text{EF}_{\text{SMSP}} \) is checked with an external card reader.

Expected behaviour

1) The DUT indicates that the new Service Centre Address is saved.

2) The DUT indicates that the mobile originated SMS is sent successfully. The DUT prompted to enter the MSISDN and does not present MSISDN #2 as the proposed destination. The SMS is received at MSISDN #1.

3) \( \text{EF}_{\text{SMSP}} \) contains the following values:
<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to Y</td>
<td>&lt;Alpha-Identifier&gt;</td>
<td>Y bytes</td>
</tr>
<tr>
<td>Y+1</td>
<td>'FD' hex = '11111101' binary =</td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>“TP-Destination Address” absent.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TS-Service Centre Address” present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Protocol Identifier” absent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Data Coding Scheme” absent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“TP-Validity Period” absent</td>
<td></td>
</tr>
<tr>
<td>Y+2 to Y+13</td>
<td>&lt;MSISDN #2&gt;</td>
<td>12 bytes</td>
</tr>
<tr>
<td>Y+14 to Y+25</td>
<td>&lt;Service Centre Address&gt;</td>
<td>12 bytes</td>
</tr>
<tr>
<td>Y+26</td>
<td>&lt;Any Protocol Identifier&gt;</td>
<td>1 byte</td>
</tr>
<tr>
<td>Y+27</td>
<td>&lt;Any Data Coding Scheme&gt;</td>
<td>1 byte</td>
</tr>
<tr>
<td>Y+28</td>
<td>&lt;Any Validity Period&gt;</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

57.1.6 Phonebook

57.1.6.1 Reading / Writing / Deleting ADNs

Description
Procedure for reading, storing and deleting of alpha identifiers and BCD numbers on the UICC with USIM’s phone book.

Related core specifications
3GPP TS 31.102 chapter 4.4.2.3

Reason for test
To ensure that the DUT stores the following data in ADN records of the UICC with USIM’s phone book:
- Alpha identifier and BCD number in national format
- Alpha identifier and BCD number in international format
- Alpha identifier and supplementary service code (SSC) strings

Further it is tested that the DUT is able to delete ADN records.

Initial configuration
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

To perform this test case an external card reader/writer for ICCs is required. With this external card reader the following ADN record is created:

Alpha Identifier = "PleaseDeleteADN", BCD Number = <any telephone number>

If the ICC’s ADN records are not filled with dummy data all, except for 2 ADN records, on the USIM shall be filled with alpha identifier and BCD numbers using the external card reader.

The ICC is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

Test procedure
Note: if the terminal doesn’t allow to edit, add, delete or dial the contacts directly on/from the SIM card, when required copy first the contact from the SIM card to the DUT phonebook, dial the numbers from the DUT phonebook, edit the contact in the DUT phonebook, copy the contact to the SIM card (in case of "delete", it may be needed to copy the complete DUT phonebook to the SIM card).
1. Delete the phone book entry with the alpha identifier “PleaseDeleteADN” from the ICC.
2. Add a new phone book entry with the alpha identifier “National Number” and an existing telephone number in national format to the ICC.
3. Add a new phone book entry with the alpha identifier “International No” and an existing telephone number in international format to the ICC.
4. Add a new phone book entry with the alpha identifier “SSC Code” and an existing supplementary service code (e.g. "+61<any international number>+<timer>#”) to the ICC.
5. Switch the Mobile off and on again (Power Cycle)
6. Select the phone book entry “National Number”. Check that the number can be correctly dialled.
7. Select the phone book entry “International No”. Check that the number can be correctly dialled.
8. Select the phone book entry “SSC Code”. Check that the supplementary service is correctly performed.
9. Switch the device off and check with the external ICC reader that the ICC’s phone book contains
   - An ADN with the alpha identifier “National Number” and the correct telephone number in national format
   - An ADN with the alpha identifier “International No” and the correct telephone number in international format
   - An ADN with the alpha identifier “SSC Code” and the correct supplementary service string
   - Does not contain the phone book entry with the alpha identifier “PleaseDeleteADN”

Expected behaviour
1. The DUT indicates that the phone book entry with the alpha identifier “PleaseDeleteADN” is deleted from the ICC.
2. The DUT indicates that the phone book entry with the alpha identifier “National Number” is added to the ICC.
3. The DUT indicates that the phone book entry with the alpha identifier “International No” is added to the ICC.
4. The DUT indicates that the phone book entry with the alpha identifier “SSC Code” is added to the ICC.
5. -
6. The phone book entry “National Number” could be selected and correctly dialled.
7. The phone book entry “International No” could be selected and correctly dialled.
8. The phone book entry “SSC Code” could be selected and the supplementary service could be correctly performed.
9. The external ICC reader indicates that the ICC’s phone book contains
   - An ADN with the alpha identifier “National Number” and the correct phone number in national format
   - An ADN with the alpha identifier “International No” and the correct phone number in international format
   - An ADN with the alpha identifier “SSC Code” and the correct supplementary service string
   - Does not contain the phone book entry with the alpha identifier “PleaseDeleteADN”

57.1.6.2 MSISDN saved on SIM, UICC and USIM

Description
Procedure for testing support of MSISDN entries.
**Related 3GPP core specifications**
3GPP TS 31.102

**Reason for test**
To ensure that a DUT supports the elementary file EF\textsubscript{MSISDN} (MSISDN).

**Initial configuration**
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Card supports the following elementary file:
- EF\textsubscript{MSISDN} (MSISDN)

Service #21 shall be activated in the USIM.

To perform this test case an external card reader/writer for USIMs is required. With this external card reader the following records are stored in the USIM:

- **EF\textsubscript{MSISDN} (Record #1)**

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>4669727374204E756D626572FF \ldots FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>07</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>91</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>942143658709FFFFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

- **EF\textsubscript{MSISDN} (Record #2)**

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>5365636F6E64204E756D626572FF \ldots FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>08</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>81</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>103254769810F2FFFFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

- **EF\textsubscript{MSISDN} (Record #3)**

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>5468697264204E6FFF \ldots FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>08</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>91</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>44214365870921FFFFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

The USIM is placed in the device.

**Test procedure**
1) The DUT is switched on and the menu function is selected where the UE’s own numbers can be displayed.
2) The entry “First Number” is selected and changed to:
3) The USIM is removed from the DUT and checked in an external card reader:

**Expected behaviour**

1) The DUT presents a list of possible numbers and present the alpha identifiers for at least the following entries in MSISDN.

<table>
<thead>
<tr>
<th>Alpha Identifier</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changed Entry</td>
<td>+12345678901234</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alpha Identifier</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Number</td>
<td>+491234567890</td>
</tr>
<tr>
<td>Second Number</td>
<td>0123456789012</td>
</tr>
<tr>
<td>Third No</td>
<td>+44123456789012</td>
</tr>
</tbody>
</table>

2) The DUT accepts the changes.

3) The entries of **EF\_MSISDN** shall be

- **EF\_MSISDN (Record #1)**

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>4368616E67655420456E747279FF ... FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>08</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>91</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>21436587092143FFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

### 57.1.6.3 Storage of directory number and name

**Description**

Procedure for storage of directory number and name

**Related GSM core specifications**

GSM 11.11, sub clause 11.5.1

**Reason for test**

To ensure that a directory number can be properly stored and retrieved

**Initial configuration**

DUT in idle mode.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Store a directory number and name on the SIM phone book.
2. Dial the stored number.
3. Store a second number under the same name.
4. Dial the second stored number.

**Expected behaviour**

1. Number is stored.
2. Number is dialled.
3. Number is stored.
4. Number is dialled.

57.1.6.4 Storage of international number (‘+’)

Description
Procedure for storage of international directory number and name

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that an international directory number can be properly stored and retrieved

Initial configuration
DUT in idle mode.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Store a directory number in International format and name on the SIM phone book.
2. Dial the stored number.

Expected behaviour
1. Number is stored.
2. Number is dialled.

57.1.6.5 Storage of SSC string (including international number: **21*+49DN#)

Description
Procedure for storage of SSC string

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that an SSC string containing an international number can be properly stored and retrieved.

Initial configuration
DUT in idle mode.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Store a SSC string including an International number on the SIM phone book. For example: Name: SSC; Number: **21*+49DN#
2. Power off DUT.
3. Power on DUT.
4. View phonebook contact.
5. Dial the SSC string from phonebook.

**Expected behaviour**
1. SSC string is stored.
2. DUT is powered off completely.
3. DUT is powered on.
4. SSC string is correctly displayed, containing International prefix.
5. SSC string is dialled.

### 57.1.6.6 Change directory number and name

**Description**
Procedure to change directory number and name

**Related GSM core specifications**
GSM 11.11, sub clause 11.5.1

**Reason for test**
To ensure that a directory number (ADN) can be changed

**Initial configuration**
DUT in idle mode
SIM phone book contains at least one entry
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**
1. Edit the stored phonebook contact name and number.
2. Power off DUT.
3. Power on DUT.
4. View phonebook contact.
5. Dial the contact.

**Expected behaviour**
1. Number and name can be edited successfully.
2. DUT is powered off completely.
3. DUT is powered on.
4. Name and number displayed are the edited ones.
5. Contact is dialled.

### 57.1.6.7 Storage of directory number and name; when SIM phone book full

**Description**
Procedure for storage of international directory number and name when SIM phone book is full
Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
1. To ensure interoperability with SIMs containing 250 ADNs.
2. To ensure that a failure indication is given when attempting to store a new directory number in a full SIM phone book

Initial configuration
DUT in idle mode.
SIM phone book full

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Attempt to edit the stored phonebook contact name and number.

Expected behaviour
DUT responds that the attempt has failed due to the phonebook being full.

57.1.6.8 Delete directory number and name

Description
Procedure to delete directory number and name

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that a directory number and name can be deleted from the SIM phone book

Initial configuration
DUT in idle mode. SIM phone book contains at least one entry

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Delete a directory number and name from the SIM phone book. Check that the number can no longer be displayed and dialled from the phone book.

Expected behaviour
The mobile deletes the name and number from the SIM phone book, and can no longer be displayed and no longer exists in the phone book.

57.1.6.9 Storage of directory number longer than 20 digits

Description
Procedure for storage of a directory numbers, SSC strings and USSD strings longer than 20 digits
Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that a directory number longer than 20 digits can be correctly stored in the SIM phone book

Initial configuration
DUT in idle mode. The SIM supports Extension fields.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Store a directory number of 40 digits (incl. separator) on the SIM phone book. The directory number shall contain a telephone number followed by a separator and DTMF numbers. Check that the number can be correctly recalled, dialled and the DTMF tones are sent after the CONNECT.
2. Store a SSC string with more than 20 digits containing a telephone number in international format, e.g. "**21*11*+49160xxxxxxxx#. Check that the SSC is recalled correctly.
3. Store a USSD string with more than 20 digits. Check that the USSD string is recalled correctly and send the string.

Expected behaviour
1. The mobile stores the number, dials the stored number correctly and sends the DTMF tones after CONNECT.
2. The mobile stores and recalls the SSC string correctly.
3. The mobile stores the USSD string correctly in the SIM. The string is recalled and sent correctly.

57.1.6.10 Extension 1 chaining (storage of > 42 digits)

Description
Procedure for storage of a directory number longer than 60 digits

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that a directory number longer than 42 digits can be correctly stored in the SIM phone book

Initial configuration
DUT in idle mode.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Store a directory number of more than 42 digits on the SIM phone book. The directory number shall contain a telephone number followed by a separator and DTMF numbers. Check that the number can be correctly recalled, dialled and the DTMF tones are sent after the CONNECT.
Expected behaviour
The mobile stores the number, dials the stored number correctly and sends the DTMF tones after CONNECT.

57.1.6.11 Display message if all Extension fields are full

Description
Procedure to indicate failure of storage of a directory number if all extension fields are used.

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that a failure indication is given when attempting to store a number longer than 20 digits when the EXT1 is full

Initial configuration
DUT in idle mode
All extension fields full in the SIM phone book
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Attempt to store a directory number of more than 20 digits on the SIM phone book. Check that the mobile indicates that the command has failed.

Expected behaviour
The mobile indicates that the command has failed.

57.1.6.12 Delete directory number more than 20 digits long

Description
Procedure to delete directory number more than 20 digits long

Related GSM core specifications
GSM 11.11, sub clause 11.5.1

Reason for test
To ensure that a directory number longer than 20 digits can be deleted

Initial configuration
DUT in idle mode. At least one directory number longer than 20 digits is stored in the SIM phone book
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Delete a directory number of more than 20 digits from the SIM phone book. Check that the number can no longer be dialled from the phone book. Check with a SIM card reader that all relevant extension records are released, i.e. no vector is pointing to this particular Extension Record.
Expected behaviour
The mobile deletes the name and number from the SIM phone book, and can no longer dial the stored number from the phone book.

57.1.7 Storage of Data

57.1.7.1 Storage of Data - General
Description
Ensure that USIM data is stored correctly following a Location Updating Accept

Related core specifications
3GPP TS 31.102 sub clause 4.2.1.7, ETSI TS 102 221.
GSM 11.11, GSM 04.08

Reason for test
To ensure that the MCC, MNC, and LAC are correctly stored on the UICC with USIM and SIM following Location Updating Accept

Initial configuration
DUT in idle mode
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Move to a new location area
2. Power off the DUT and remove the SIM
3. Check the data fields contain the correct information.

Expected behaviour
1. Check that a location update is successfully completed.
2. DUT is powered off completely and SIM is successfully removed.
3. The following fields are updated:
   - The LAI field of EF_LOCI shall contain the correct MCC, MNC and LAC.
   - The TMSI field of EF_LOCI shall contain the updated TMSI.
   - The Location Update status of EF_LOCI shall indicate "updated".
   - The Ciphering key Kc field of EF_KC shall contain the newly calculated value of Kc
   - The Ciphering key sequence number n field of EF_KC shall contain a valid ciphering key sequence number.

57.1.7.2 MCC, MNC deleted from forbidden PLMN list
Description
Ensure that the MCC and MNC are removed from the forbidden PLMN list during roaming if a successful Location Update is completed using that network

Related core specifications
3GPP TS 31.102 sub clause 4.2.16, 3GPP TS 24.008, ETSI TS 102 221.
GSM 11.11, GSM 04.08
Reason for test
To ensure that the MCC and MNC are removed from the forbidden PLMN list if a successful Location Update is completed using that network

Initial configuration
A subscription shall be used with an MCC different from the available PLMNs.
DUT switched off.
All available PLMNs are listed in the forbidden PLMN list on the USIM
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Power on the DUT.
2. Wait for DUT to successfully select the network and display full service.
3. Power off the DUT.
4. Check the data fields contain the correct information.

Expected behaviour
1. DUT is powering on.
2. DUT displays full service.
3. DUT is powered off completely.
4. Check MCC and MNC of the selected PLMN shall not be included within EF_{FPLMN}.

57.1.7.3 Storage of USIM Data after LUP reject, IMSI unknown in HLR

Description
Ensure that USIM data is stored correctly following a Location Updating Reject, with the failure given as "IMSI unknown in HLR"

Related core specifications
3GPP TS 31.102, 3GPP TS 24.008, ETSI TS 102 221
GSM 04.08, GSM 11.11

Reason for test
To ensure that, when the location updating process fails, with the failure given as "IMSI unknown in HLR" (reject cause #2), the location information is stored correctly

Initial configuration
DUT is switched off. UICC/USIM or SIM contains an invalid IMSI
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Power on DUT.
2. Wait for DUT to attempt to camp to network.
3. Power off the DUT and remove the SIM
4. Check the data fields contain the correct information.

**Expected behaviour**

1. DUT is powering on.
2. DUT fails to camp to network.
3. DUT is powered off completely.
4. The following fields are correct:
   - The LAI field of EFLOCI shall be cleared.
   - The TMSI field of EFLOCI shall be cleared.
   - The Location Update status of EFLOCI shall indicate "Location Area not allowed".
   - The Ciphering key Kc field of EFKC shall be cleared
   - The Ciphering key sequence number n field of EFKC shall be cleared

**57.1.7.4 Storage of USIM Data after LUP reject, Authentication error**

**Description**
Ensure that SIM data is stored correctly following a Location Updating Reject, with the failure given as "Illegal UE"

**Related core specifications**
3GPP TS 31.102, 3GPP TS 24.008, ETSI TS 102 221
GSM 04.08, GSM 11.11

**Reason for test**
To ensure that, when the location updating process fails, with the failure given as "illegal UE" (reject cause #3), the location information is stored correctly

**Initial configuration**
DUT is switched off. UICC/USIM or SIM contains an invalid ciphering key
Where possible, use as many of the following types:
   - A SIM (ICC)
   - A UICC with SIM only
   - A UICC with SIM and USIM

**Test procedure**
1. Power on DUT.
2. Wait for DUT to attempt to camp to network.
3. Power off the DUT and remove the SIM
4. Check the data fields contain the correct information.

**Expected behaviour**
1. DUT is powering on.
2. DUT fails to camp to network.
3. DUT is powered off completely.
4. The following fields are correct:
   - The LAI field of EFLOCI shall be cleared.
   - The TMSI field of EFLOCI shall be cleared.
   - The Location Update status of EFLOCI shall indicate "Location Area not allowed".
• The Ciphering key $K_c$ field of $EF_{KC}$ shall be cleared
• The Ciphering key sequence number $n$ field of $EF_{KC}$ shall be cleared

57.1.7.5 Storage of USIM Data after LUP reject, PLMN not allowed

Description
Ensure that SIM data is stored correctly following a Location Updating Reject, with the failure given as "PLMN not allowed"

Related core specifications
3GPP TS 31.102, 3GPP TS 24.008, ETSI TS 102 221
GSM 04.08, GSM 11.11

Reason for test
To ensure that, when the location updating process fails, with the failure given as "PLMN not allowed" (reject cause #11), the location information is stored correctly

Initial configuration
DUT is switched off. DUT is located in an area where the only available networks will all respond with "PLMN not allowed". On the USIM or SIM, all four fields of $EF_{PLMN}$ are filled with valid data (but not indicating any currently available PLMN).

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
1. Power on DUT.
2. Wait for DUT to attempt to camp to network.
3. Power off the DUT and remove the SIM
4. Check the data fields contain the correct information.

Expected behaviour
1. DUT is powering on.
2. DUT fails to camp to network.
3. DUT is powered off completely.
4. The following fields are correct:
   • The LAI field of $EF_{LOCI}$ shall be cleared.
   • The TMSI field of $EF_{LOCI}$ shall be cleared.
   • The Location Update status of $EF_{LOCI}$ shall indicate "Location Area not allowed".
   • The Ciphering key $K_c$ field of $EF_{KC}$ shall be cleared
   • The Ciphering key sequence number $n$ field of $EF_{KC}$ shall be cleared

57.1.7.6 Storage of USIM Data after LUP reject, LA not allowed

Description
Ensure that SIM data is stored correctly following a Location Updating Reject, with the failure given as "Location Area not allowed"

Related core specifications
3GPP TS 31.102, 3GPP TS 24.008, ETSI TS 102 221
Reason for test
To ensure that, when the location updating process fails, with the failure given as "Location Area not allowed" (reject cause #12), the location information is stored correctly.

Initial configuration
DUT is switched off. DUT is located in an area where the only allowed network will respond with "Location Area not allowed".

Where possible, use as many of the following types:
  • A SIM (ICC)
  • A UICC with SIM only
  • A UICC with SIM and USIM

Test procedure
1. Power on DUT.
2. Wait for DUT to attempt to camp to network.
3. Power off the DUT and remove the SIM.
4. Check the data fields contain the correct information.

Expected behaviour
1. DUT is powering on.
2. DUT fails to camp to network.
3. DUT is powered off completely.
4. The following fields are correct:
   • The LAI field of EFLOCI shall be cleared.
   • The TMSI field of EFLOCI shall be cleared.
   • The Location Update status of EFLOCI shall indicate "Location Area not allowed".
   • The Ciphering key Kc field of EFKC shall be cleared
   • The Ciphering key sequence number n field of EFKC shall be cleared

57.1.7.7 Storage in forbidden PLMN list without loss of information in list

Description
Ensure that USIM data is stored correctly following a Location Updating Reject, with the failure given as "PLMN not allowed".

Related core specifications
3GPP TS 31.102, 3GPP TS 24.008, ETSI TS 102 221
GSM 04.08, GSM 11.11

Reason for test
To ensure that, when the location updating process fails, with the failure given as "PLMN not allowed" that the location information is stored correctly.

Initial configuration
DUT is switched off. DUT is located in an area where the only available networks will all respond with "PLMN not allowed". The PLMN 3 field of EF_FPLMN is filled with valid data (but not indicating any currently available PLMN), the remaining three fields are blank.

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
1. Power on DUT.
2. Wait for DUT to attempt to camp to network.
3. Power off the DUT and remove the SIM
4. Check the data fields contain the correct information.

Expected behaviour
1. DUT is powering on.
2. DUT fails to camp to network.
3. DUT is powered off completely.
4. The following fields are correct:
   • The LAI field of EFLOCI shall be cleared.
   • The TMSI field of EFLOCI shall be cleared.
   • The Location Update status of EFLOCI shall indicate "Location Area not allowed".
   • The Ciphering key Kc field of EFKC shall be cleared
   • The Ciphering key sequence number n field of EFKC shall be cleared
   • The MCC and MNC of the network shall be stored in one of the blank fields of EFFPLMN. The original valid data shall still be present.

57.1.8 SIM Application Toolkit

In this section, it may be possible to combine several tests into one procedure, in that for instance proactive SIM commands may be triggered by SIM events. The precise range and order of tests to be carried out will depend on the features supported by the MS, and on the applications available in the SIM.

The detailed expected behaviour in each test depends on the exact features implemented in the SIM toolkit application. Therefore in most cases the detailed behaviour is specific in terms of what the SIM application is designed to do.

A lot of the problems with SIM Application Toolkit occur on multiple events and/or commands. Therefore SIM Toolkit Applications provided on the SIM card of the operators shall be used for field tests additionally to the tests outlined below.

57.1.8.1 Terminal Profile Download

Description
Ensure that the TERMINAL PROFILE command is correctly provided by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the TERMINAL PROFILE command is correctly provided by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the TERMINAL PROFILE command.

Where possible, use as many of the following types:
Test procedure
Arrange to receive the DUT Terminal Profile. When the Terminal Profile is received, check that the
SIM application is triggered.

Expected behaviour
The SIM application triggered by the Terminal Profile is started and the handset information is
provided.

57.1.8.2  Proactive SIM Commands

57.1.8.2.1  DISPLAY TEXT

Description
Ensure that the DISPLAY TEXT command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the DISPLAY TEXT command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the DISPLAY TEXT command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrange for an event to occur which will cause the SIM to send a normal priority DISPLAY TEXT
command with 1 character in unpacked format during a short delay.

Arrange for an event to occur which will cause the SIM to send a high priority DISPLAY TEXT
command with 240 characters in packet format waiting for user confirmation.

Arrange for an event to occur which will cause the SIM to send a high priority DISPLAY TEXT
command with 120 characters in UCS2 format during a short delay.

Expected behaviour
The correct text shall be displayed on the DUT display.

57.1.8.2.2  GET INKEY

Description
Ensure that the GET INKEY command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the GET INKEY command is correctly processed by the MS.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the GET INKEY command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrangement for an event to occur which will cause the SIM to send a GET INKEY command for retrieving 1 character (only digits are allowed) in unpacked format with screen echo.

Arrangement for an event to occur which will cause the SIM to send a GET INKEY command for retrieving a character in packet format without screen echo.

Arrangement for an event to occur which will cause the SIM to send a GET INKEY command for retrieving an UCS2 character with screen echo.

Arrangement for an event to occur which will cause the SIM to send a GET INKEY command for retrieving binary option ('yes/no' mode).

Expected behaviour
The DUT shall prompt the user for entry of a single character. The correct action shall be taken according to the application when the user enters a character.

57.1.8.2.3 GET INPUT

Description
Ensure that the GET INPUT command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the GET INPUT command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the GET INPUT command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a GET INPUT command for retrieving 8 characters (only digits) in unpacked format with screen echo.

2. Arrange for an event to occur which will cause the SIM to send a GET INPUT command for retrieving 128 characters in packet format without echo providing a default text.

3. Arrange for an event to occur which will cause the SIM to send a GET INPUT command for retrieving 127 characters in packet format without echo providing a default text.

4. Arrange for an event to occur which will cause the SIM to send a GET INPUT command for retrieving 80 UCS2 characters with echo.

Expected behaviour
The DUT shall prompt the user for entry of a string. The correct action shall be taken according to the application when the user enters a string.
57.1.8.2.4  PLAY TONE

Description
Ensure that the PLAY TONE command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the PLAY TONE command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the PLAY TONE command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a PLAY TONE command, 'general beep' sound type with null alpha text.
2. Arrange for an event to occur which will cause the SIM to send a PLAY TONE command, 'general beep' sound type with an alpha text.

Expected behaviour
1. The DUT shall play the corresponding tone.
2. The DUT shall play the corresponding tone and the correct text shall be displayed on the DUT display.

57.1.8.2.5  SET-UP MENU

Description
Ensure that the SET-UP MENU command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the SET-UP MENU command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SET-UP MENU command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur (user menu selection) which will cause the SIM to send a SET-UP MENU command.
2. Arrange for an event to occur (incoming data-download short message) which will cause the SIM to send a SET-UP MENU command.
Expected behaviour
The DUT shall show the appropriate menus within its menu structure. The appropriate SIM application toolkit actions shall be triggered when those menus are selected.

57.1.8.2.6 SELECT ITEM
Description
Ensure that the SELECT ITEM command is correctly processed by the MS.
Related GSM core specifications
GSM 11.14
Reason for test
To ensure that the SELECT ITEM command is correctly processed by the MS.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SELECT ITEM command.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to (user menu selection) occur which will cause the SIM to send a SELECT ITEM command.
2. Arrange for an event to occur (incoming data-download short message) which will cause the SIM to send a SELECT ITEM command.

Expected behaviour
The DUT shall prompt the user to select between a number of options presented. The appropriate action shall be carried out by the SIM application when an action is selected by the user.

57.1.8.2.7 SEND SHORT MESSAGE
Description
Ensure that the SEND SHORT MESSAGE command is correctly processed by the MS.
Related GSM core specifications
GSM 11.14
Reason for test
To ensure that the SEND SHORT MESSAGE command is correctly processed by the MS.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SEND SHORT MESSAGE command.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (0 characters, packed format) command with a null alpha identifier.
2. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (1 character, unpacked format, default alphabet) command with a null alpha identifier.

3. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (127 characters, packed format, default alphabet) command with a null alpha identifier.

4. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (128 characters, packed format, default alphabet) command with a non-null alpha identifier.

5. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (160 characters, packed format, default alphabet) command with a non-null alpha identifier.

6. Arrange for an event to occur which will cause the SIM to send a SEND SHORT MESSAGE (70 characters, packed format, UCS2 alphabet) command with a non-null alpha identifier.

**Expected behaviour**

1. The DUT shall send a short message with contents and destination as specified by the SIM application without providing any notification to the user.

2. The DUT shall send a short message with contents and destination as specified by the SIM application without providing any notification to the user.

3. The DUT shall send a short message with contents and destination as specified by the SIM application without providing any notification to the user.

4. The DUT shall send a short message with contents and destination as specified by the SIM application and provide a notification to the user.

5. The DUT shall send a short message with contents and destination as specified by the SIM application and provide a notification to the user.

6. The DUT shall send a short message with contents and destination as specified by the SIM application and provide a notification to the user.

**57.1.8.2.8  SEND SS**

**Description**

Ensure that the SEND SS command is correctly processed by the MS.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that the SEND SS command is correctly processed by the MS.

**Initial configuration**

DUT in idle mode. SIM inserted with an application that makes use of the SEND SS command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Arrange for an event to occur which will cause the SIM to send a SEND SS command with a null alpha identifier.

2. Arrange for an event to occur which will cause the SIM to send a SEND SS command with a non-null alpha identifier.

**Expected behaviour**

1. The DUT shall send an SS request with contents as specified by the SIM application without providing any notification to the user that the SS request is being sent.
2. The DUT shall send an SS request with contents as specified by the SIM application and provide a notification to the user.

In both cases, the SS request string shall not be recorded as the last number dialled.

57.1.8.2.9 SEND USSD

Description
Ensure that the SEND USSD command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the SEND USSD command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SEND USSD command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a SEND USSD command (7 bits format) with a null alpha identifier.
2. Arrange for an event to occur which will cause the SIM to send a SEND USSD command, (8 bits format), with a non-null alpha identifier.

Expected behaviour
1. The DUT shall send a USSD request with contents as specified by the SIM application without providing any notification to the user that the USSD request is being sent.
2. The DUT shall send a USSD request with contents as specified by the SIM application and provide a notification to the user.

In both cases, if the network feature invoked by means of the USSD request requires a dialogue between the network and the user which involves the MMI of the ME, then check that this dialogue occurs.

57.1.8.2.10 SET UP CALL

Description
Ensure that a SET UP CALL command of type "set up call, but only if not currently busy on another call" is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that a SET UP CALL command of type "set up call, but only if not currently busy on another call" is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SET UP CALL command.

Where possible, use as many of the following types:

- A SIM (ICC)
Test procedure
1. Arrange for an event to occur which will cause the SIM to send a SET UP CALL command of type "set up call, but only if not currently busy on another call".
2. Set up a manual call, and then arrange for an event to occur which will cause the SIM to send a SET UP CALL command of type "set up call, but only if not currently busy on another call".
3. Set up a manual call, and then arrange for an event to occur which will cause the SIM to send a SET UP CALL command of type "set up call, but only if not currently busy on another call, with redial".
4. Set up a manual call, and then arrange for an event to occur which will cause the SIM to send a SET UP CALL command of type "set up call, putting all other calls (if any) on hold"
5. Set up a manual call, and then arrange for an event to occur which will cause the SIM to send a SET UP CALL command of type "set up call, disconnecting all other calls (if any)"

Expected behaviour
1. The call shall be set up to the number defined by the application, and notification provided to the user.
2. The call shall not be set up, and notification of the failure shall be provided to the user.
3. The call shall not be set up until the user has cleared the first call. After that the call shall be set up to the number defined by the application, and notification provided to the user.
4. The manual call shall be placed on hold, and then the call shall be set up to the number defined by the application, and notification provided to the user.
5. The manual call shall be cleared, and then the call shall be set up to the number defined by the application, and notification provided to the user.

In each case, the number called shall not be stored as the last number dialled.

57.1.8.2.11 SET UP IDLE MODE TEXT

Description
Ensure that the SET UP IDLE MODE TEXT command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the SET UP IDLE MODE TEXT command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the SET UP IDLE MODE TEXT command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrange for an event to occur which will cause the SIM to send a SET UP IDLE MODE TEXT command.
Expected behaviour
When the DUT next displays the normal stand-by display screen, the text shall instead be that contained in the SET UP IDLE MODE TEXT command.

57.1.8.2.12 RUN AT COMMAND

Description
Ensure that the RUN AT COMMAND command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the RUN AT COMMAND command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the RUN AT COMMAND command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur (user menu selection) which will cause the SIM to send a RUN AT COMMAND command using a data previously entered by the user.
2. Arrange for an event to occur (incoming data download short message) which will cause the SIM to send a RUN AT COMMAND command using the short message data received.

Expected behaviour
The DUT shall perform the actions required by the RUN AT COMMAND command as if it had been issued by a terminal attached to the MS.

57.1.8.2.13 SEND DTMF COMMAND

Description
Ensure that the SEND DTMF COMMAND command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the SEND DTMF COMMAND command is correctly processed by the MS.

Initial configuration
MS in the active state of a voice call. SIM inserted with an application that makes use of the SEND DTMF COMMAND command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrange for an event to occur which will cause the SIM to send a SEND DTMF COMMAND command.
Expected behaviour
The DUT shall send the DTMF tones required by the SEND DTMF COMMAND command.

57.1.8.2.14 LANGUAGE NOTIFICATION

Description
Ensure that the LANGUAGE NOTIFICATION command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the LANGUAGE NOTIFICATION command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the LANGUAGE NOTIFICATION command.

Test procedure
Arrange for an event to occur which will cause the SIM to send a LANGUAGE NOTIFICATION command.

Expected behaviour
The DUT shall display text in the language specified by the LANGUAGE NOTIFICATION command.

57.1.8.2.15 LAUNCH BROWSER

Description
Ensure that the LAUNCH BROWSER command is correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the LAUNCH BROWSER command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the LAUNCH BROWSER command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a LAUNCH BROWSER command using a default URL.
2. Arrange for an event to occur (user menu selection) which will cause the SIM to send a LAUNCH BROWSER command using an URL entered previously by the user.
3. Arrange for an event to occur (incoming data download short message) which will cause the SIM to send a LAUNCH BROWSER command using the short message data received.

Expected behaviour
The DUT shall launch the browser and display the content of the specified URL.
57.1.8.2.16 OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA, SEND DATA

Description
Ensure that the OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA and SEND DATA commands are correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA and SEND DATA commands are correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA and SEND DATA command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrange for an event to occur which will cause the SIM to send an OPEN CHANNEL command (on demand CSD connection with a buffer-size of 140 bytes) and then use the RECEIVE DATA and/or SEND DATA commands to exchange data with a server in the network, and finally to use the CLOSE CHANNEL.

Arrange for an event to occur which will cause the SIM to send an OPEN CHANNEL command (immediate GPRS connection with a buffer-size of 3000 bytes) and then use the RECEIVE DATA and/or SEND DATA commands to exchange data with a server in the network, and finally to use the CLOSE CHANNEL.

Expected behaviour
The DUT shall either set up a circuit switched data connection or a GPRS connection, depending on the parameters of the OPEN CHANNEL command, and shall exchange the data with the network, and then clear the connection.

57.1.8.2.17 PROVIDE LOCAL INFORMATION

Description
Ensure that current local information requested by the SIM are correctly processed by the MS.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that PROVIDE LOCAL INFORMATION command is correctly processed by the MS.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the PROVIDE LOCAL INFORMATION command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM
Test procedure

1. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (Location information) command.

2. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (IMEI) command.

3. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (Network Measurement Results and the BCCH channel list) command.

4. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (current date, time and time zone) command.

5. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (current ME language setting) command.

6. Arrange for an event to occur which will cause the SIM to send an PROVIDE LOCAL INFORMATION (Timing Advance) command.

Expected behaviour

The DUT shall pass to the SIM the data demanded by the PROVIDE LOCAL INFORMATION command.

57.1.8.2.18 POLL INTERVAL/POLLING OFF

Description

Ensure that polling requested by the SIM are correctly processed by the MS.

Related GSM core specifications

GSM 11.14

Reason for test

To ensure that POLL INTERVAL/POLLING OFF commands are correctly processed by the MS.

Initial configuration

DUT in idle mode. SIM inserted with an application that makes use of POLL INTERVAL/POLLING OFF commands.

Test procedure

1. Arrange for an event to occur which will cause the SIM to send an POLL INTERVAL command of 30 seconds.

2. Arrange for an event to occur which will cause the SIM to send an POLLING OFF command.

Expected behaviour

The DUT shall send a STATUS command when period of time defined has expired.

57.1.8.2.19 REFRESH

Description

Ensure that refresh requested by the SIM are correctly processed by the MS.

Related GSM core specifications

GSM 11.14

Reason for test

To ensure that REFRESH command is correctly processed by the MS.

Initial configuration

DUT in idle mode. SIM inserted with an application that makes use of REFRESH command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Initialization) command.
2. Arrange for an event to occur which will cause the SIM to send a REFRESH (File Change Notification) command.
3. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Initialization and File Change Notification) command.
4. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Initialization and Full File Change Notification) command.
5. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Reset) command.
6. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Initialization and File Change Notification within IMSI file) command.
7. Arrange for an event to occur which will cause the SIM to send a REFRESH (SIM Initialization and Full File Change Notification within IMSI file) command.

**Expected behaviour**

The DUT shall refresh its memory regarding files notified.

### 57.1.8.2.20 MORE TIME

**Description**

Ensure that extra-time requested by the SIM is correctly processed by the MS.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that MORE TIME command are correctly processed by the MS.

**Initial configuration**

DUT in idle mode. SIM inserted with an application that makes use of MORE TIME command.

**Test procedure**

Arrange for an event to occur which will cause the SIM to send a MORE TIME command.

**Expected behaviour**

The DUT shall accept correctly the extra-time requested by the SIM.

### 57.1.8.2.21 TIMER MANAGEMENT

**Description**

Ensure that the TIMER MANAGEMENT requested by the SIM is correctly processed by the MS.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that the timers requested by the SIM are correctly processed by the MS.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of TIMER MANAGEMENT command.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange for an event to occur which will cause the SIM to send several TIMER MANAGEMENT commands requesting up to 8 different timers, each one with a different timer value.
2. Arrange for an event to occur which will cause the SIM to send a TIMER MANAGEMENT command requesting the current timer value of the different timers defined previously in the MS.

Expected behaviour
1. The DUT shall implement correctly different timers requested.
2. The DUT shall provide to the SIM the current value of each timer requested.

57.1.8.3 SIM Events

57.1.8.3.1 MT call event

Description
Ensure that the MT call event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the MT call event is sent to the SIM.

Initial configuration
DUT in idle Mode. SIM inserted with an application that makes use of the MT call event.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Arrange to receive an incoming call.

Expected behaviour
The SIM application triggered by the MT call event is started.

57.1.8.3.2 Call connected event

Description
Ensure that the Call connected event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Call connected event is sent to the SIM.
Initial configuration
DUT in idle Mode. SIM inserted with an application that makes use of the Call connected event.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange to receive an incoming call. When the call is answered, check that the SIM application is triggered.
2. Make an outgoing call. When the call is answered, check that the SIM application is triggered.

Expected behaviour
In each case, the SIM application triggered by the Call connected event is started when the call is connected

57.1.8.3.3 Call disconnected event

Description
Ensure that the Call disconnected event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Call disconnected event is sent to the SIM.

Initial configuration
DUT in idle Mode. SIM inserted with an application that makes use of the Call disconnected event.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
1. Arrange to receive an incoming call. Answer the call and then clear the call. When the call is cleared, check that the SIM application is triggered.
2. Make an outgoing call. Answer the call and then clear the call. When the call is cleared, check that the SIM application is triggered.

Expected behaviour
In each case, the SIM application triggered by the Call disconnected event is started when the call is cleared.

57.1.8.3.4 Location status event

Description
Ensure that the Location status event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Location status event is sent to the SIM.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the Location status event.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Move into a new location area, and check that the SIM application is triggered.

Expected behaviour
The SIM application triggered by the Location status event is started when a new location area is entered.

57.1.8.3.5 User activity event

Description
Ensure that the User activity event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the User activity event is sent to the SIM.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the User activity event.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Perform some action which will trigger the user activity event, such as accessing a menu, and check that the SIM application is triggered.

Expected behaviour
The SIM application triggered by the User activity event is started when the user activity is performed.

57.1.8.3.6 Idle screen available event

Description
Ensure that the Idle screen available event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Idle screen available event is sent to the SIM.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the Idle screen available event.

Where possible, use as many of the following types:

- A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Perform any action (for instance making and then clearing a call, and then wait until the normal stand-by display is showing, and check that the SIM application is triggered

Expected behaviour
The SIM application triggered by the Idle screen available event is started when the normal stand-by display is shown.

57.1.8.3.7 Card reader status event

Description
Ensure that the Card reader status event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Card reader status event is sent to the SIM.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the Card reader status event.

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Perform an action such as attaching or detaching an external card reader, or inserting or removing an auxiliary smart card, which will trigger the Card reader status.

Expected behaviour
The SIM application triggered by the Card reader status event is started when started when the action is performed.

57.1.8.3.8 Language selection event

Description
Ensure that the Language selection event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Language selection event is sent to the SIM.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the Language selection event.

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM
Test procedure
By means of MMI commands, change the currently used language on the MS.

Expected behaviour
The SIM application triggered by the Language selection event is started when the currently used language is changed.

57.1.8.3.9 Browser Termination event

Description
Ensure that the Browser Termination event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Browser Termination event is sent to the SIM.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of the Browser Termination event.

Test procedure
Start a WAP session, then terminate the browser.

Expected behaviour
The SIM application triggered by the Browser Termination event is started when the browser is terminated.

57.1.8.3.10 Data available event

Description
Ensure that the Data available event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Data available event is sent to the SIM.

Initial configuration
SIM inserted with an application that makes use of the Data available event. DUT with a transparent channel open between the SIM and a server in the network

Test procedure
Arrange for data to be sent from the server to the MS.

Expected behaviour
The SIM application triggered by the Data available event is started when data is received.

57.1.8.3.11 Channel status event

Description
Ensure that the Channel status event is sent to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the Channel status event is sent to the SIM
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Initial configuration**

SIM inserted with an application that makes use of the Channel status event. DUT with a transparent channel open between the SIM and a server in the network.

**Test procedure**

Arrange for data to be sent from the server to the MS, then arrange for the data to stop, while the channel remains open.

**Expected behaviour**

The SIM application triggered by the Channel status event is started when data there is no more data to be processed.

### 57.1.8.4 Call Control by SIM

#### 57.1.8.4.1 MO Calls

**Description**

Ensure that the DUT passes details of MO calls to the SIM before making calls.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that the DUT passes details of MO calls to the SIM before making calls.

**Initial configuration**

DUT in idle mode. SIM inserted with an application that makes use of Call Control.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

Make an outgoing call. Check that whatever action is supposed to be taken by the SIM application actually occurs.

**Expected behaviour**

The DUT shall perform the call setup as modified by the SIM application.

#### 57.1.8.4.2 Supplementary Services

**Description**

Ensure that the DUT passes details of SS requests to the SIM before making calls.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that the DUT passes details of SS requests to the SIM before making calls.
Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of Call Control.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Make an SS request. Check that whatever action is supposed to be taken by the SIM application actually occurs

Expected behaviour
The DUT shall send the SS request as modified by the SIM application.

57.1.8.4.3 USSD

Description
Ensure that the DUT passes details of USSD strings to the SIM before making calls.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the DUT passes details of USSD strings to the SIM before making calls.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of Call Control.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Send a USSD string. Check that whatever action is supposed to be taken by the SIM application actually occurs

Expected behaviour
The DUT shall send the USSD string as modified by the SIM application.

57.1.8.4.4 Interaction with FDN

Description
Ensure correct interaction with FDN

Related GSM core specifications
GSM 11.14

Reason for test
To ensure correct interaction with FDN.

Initial configuration
DUT in idle mode. FDN active. SIM inserted with an application that makes use of Call Control, and modifies the outgoing number to one prohibited by FDN.
Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Make an outgoing call. Check that whatever action is supposed to be taken by the SIM application actually occurs.

Expected behaviour
The DUT shall make the outgoing call to the number as modified by the SIM application.

57.1.8.5 MO Short Message Control by SIM

Description
Ensure that the DUT passes details of MO Short Messages to the SIM before sending them.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the DUT passes details of MO Short Messages to the SIM before sending them.

Initial configuration
DUT in idle mode. FDN active. SIM inserted with an application that makes use of MO Short Message control.

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Send an MO SM. Check that whatever action is supposed to be taken by the SIM application actually occurs

Expected behaviour
The DUT shall send the MO SM as modified by the SIM application.

57.1.8.6 SMS Data Download

Description
Ensure that the DUT delivers data download short messages to the SIM.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the DUT passes data download SM to the SIM correctly.

Initial configuration
1. DUT in idle mode. SIM inserted with an application that makes use of Data Download SM.
2. DUT in idle mode. SIM inserted with an application that makes use of Data Download SM and replies ‘SIM Busy’ (SW=‘93 00’).
3. DUT in idle mode. SIM inserted with an application that makes use of Data Download SM, supports proof of receipt capability and replies ‘RP-ACK’.
4. DUT in idle mode. SIM inserted with an application that makes use of Data Download SM, supports proof of receipt capability and replies ‘RP-NACK’.

5. DUT in idle mode. SIM inserted with an application that makes use of Data Download SM and replies network error (SW=‘6F XX’)

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

1. Send a MT DataDownload SM.
2. Send a MT DataDownload SM.
3. Send a MT DataDownload SM with SMS-SUBMIT mode proof of receipt functionality.
4. Send a MT DataDownload SM with SMS-DELIVER-REPORT mode proof of receipt functionality.
5. Send a MT DataDownload SM.

**Expected behaviour**

1. The DUT shall provide the SM to the SIM transparently for the user.
2. The DUT shall provide the SM to the SIM transparently for the user and the DUT shall manage SIM response accordingly.
3. The DUT shall provide the SM to the SIM transparently for the user. Then the DUT shall send back SIM response to the network accordingly.
4. The DUT shall provide the SM to the SIM transparently for the user. Then the DUT shall send back SIM response to the network accordingly.
5. The DUT shall provide the SM to the SIM transparently for the user. Then the DUT shall send back SIM response to the network accordingly.

### 57.1.8.7 CB Data Download

**Description**

Ensure that the DUT delivers data download CB message to the SIM.

**Related GSM core specifications**

GSM 11.14

**Reason for test**

To ensure that the DUT passes data download CB message to the SIM correctly.

**Initial configuration**

DUT in idle mode. SIM inserted with an application that makes use of Data Download CB.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

Send a CB Data Download message.

**Expected behaviour**

The DUT shall provide the CB message to the SIM transparently for the user.
57.1.8.8 Timer Expiration

Description
Ensure that when a timer previously started by a Timer Management proactive command expires, the DUT shall pass the identifier of the timer that has expired and its value.

Related GSM core specifications
GSM 11.14

Reason for test
To ensure that the DUT passes the identifier of the timer has expired and its value.

Initial configuration
DUT in idle mode. SIM inserted with an application that makes use of Timer Expiration and Timer Management.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Insert a SIM with an application that establish a timer in the MS.

Expected behaviour
The DUT shall inform about TIMER EXPIRATION to the SIM application.

57.1.8.9 SAT Interworking with GSM

57.1.8.9.1 Access SAT menu after user's subscription rejection

Description
Ensure that the DUT can access SAT menu although SIM's subscription has been rejected by the network (for example if there is no roaming agreements).

Related GSM core specifications
None

Reason for test
To ensure that the DUT correctly accesses the SAT menu after SIM's subscription has been rejected by the network.

Initial configuration
MS within a SIM's subscription no valid. The SIM shall include an application with a no network related SAT command.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Access the SAT menu and trigger application.

Expected behaviour
The DUT executes the proactive command.
57.1.8.9.2 Access SAT menu during a call

Description
Ensure that the DUT can access SAT menu while engaged in a call.

Related GSM core specifications
None

Reason for test
To ensure that the DUT correctly accesses the SAT menu while the subscriber is engaged in a call.

Initial configuration
MS is in connected mode.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Access the SAT menu and send a request to the SAT menu.

Expected behaviour
The DUT receives the SM of replay from the network.

57.1.8.9.3 Receive calls while using SAT menu

Description
Ensure that the DUT can receive calls while engaged in the SAT menu.

Related GSM core specifications
None

Reason for test
To ensure that the DUT correctly receives calls while the subscriber is in the SAT menu.

Initial configuration
Having accessed the SAT menu the DUT remains engaged in it.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Make a voice call to the MS, which is engaged in the SAT menu.

Expected behaviour
The DUT receives the call and the conversation begins.

57.1.8.9.4 Receive a second call while the DUT is engaged in a first voice call and in SAT menu

Description
To ensure that the DUT supports the possibility to establish a second incoming call also when it is already engaged in a first call and in the SAT menu (Call Waiting is activated)
Related GSM core specifications
None

Reason for test
To ensure that the DUT establishes the second call without closing the first call and/or the SAT application.

Initial configuration
The DUT under test (MS #1) accesses the SAT menu and establishes a first incoming call with DUT #2.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
MS #1 receives a second incoming call from DUT #3 and signals the reception of it (Call Waiting is activated).

Expected behaviour
The DUT under test (MS #1) puts the first call on hold, activates the second call and remains still engaged in the SAT menu.

57.1.8.9.5 Closing the call from subscriber while using SAT menu

Description
To ensure that when the DUT is engaged both in a call and in the SAT menu, the DUT shall not close the SAT application if the subscriber closes the call.

Test procedure
Close the call from DUT under test (MS #1).

Expected behaviour
The DUT under test remains still engaged in the SAT menu.

57.1.8.9.6 Closing the call from the other connected part while using SAT menu

Description
To ensure that when the DUT is engaged both in a call and in the SAT menu, the DUT shall not close the SAT application when the other connected part closes the call.
Related GSM core specifications
None

Reason for test
To ensure that the DUT closes only the voice call without closing the SAT menu.

Initial configuration
The DUT under test (MS #1) accesses the SAT menu and receives a call from another DUT (MS#2). Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Close the call from MS#2.

Expected behaviour
The DUT under test closes the voice call and remains still engaged in the SAT menu.

57.1.8.9.7 Receive short messages while using SAT menu

Description
Ensure that the DUT can receive short messages while engaged in the SAT menu.

Related GSM core specifications
None

Reason for test
To ensure that the DUT correctly receives SM-s while the subscriber is in the SAT menu.

Initial configuration
Having sent a request to the SAT menu the DUT remains engaged in it. Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Send a request to SAT menu and receive a short message from another DUT at the same time.

Expected behaviour
The DUT shall receive the short message correctly.

57.1.8.9.8 Receive short messages while typing text in an input dialog screen
(Get Input proactive command)

Description
Ensure that the reception of a short message, while typing text in an input dialog screen (get input), doesn’t cause the loss of the text already entered.

Related GSM core specifications
None
Reason for test
To ensure that the reception of a SM doesn't cause the DUT to close the SAT application or to lose the entered text.

Initial configuration
Start a request from the local SAT application and enter the text in the input dialog screen (get input). Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
The DUT shall receive the short message.

Expected behaviour
The DUT shall not close the SAT menu and shall continue showing the text entered.

57.1.8.9.9 Receive WAP Push while using SAT menu

Description
Ensure that the DUT can receive WAP Push while engaged in the SAT menu.

Related GSM core specifications
None

Reason for test
To ensure that the DUT correctly receives WAP Push while the subscriber is in the SAT menu.

Initial configuration
MS accesses the SAT menu and remains engaged in it. Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Receive a WAP Push message.

Expected behaviour
MS shall receive the WAP Push correctly.

57.1.8.9.10 Receive WAP Push while typing text in an input dialog screen (Get Input proactive command)

Description
To ensure that the reception of a WAP Push, while typing text in an input dialog screen (get input), doesn't cause the loss of the text already entered.

Related GSM core specifications
None

Reason for test
To ensure that the reception of a WAP Push doesn't cause the DUT to close the SAT application and/or lose the already entered text.
Initial configuration
Start a request from the local SAT application and enter text in an input dialog screen.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Receive a WAP Push message.

Expected behaviour
MS shall not close the SAT menu and shall continue showing the text.

57.1.8.9.11 WAP session after sending a request from the SAT menu

Description
Ensure that the DUT receives correctly the SM from the remote content server during WAP session.

Related GSM core specifications
None

Reason for test
To ensure that the DUT starts a WAP session just after sending a request from the SAT application, and the SM from the remote server can be correctly received.

Initial configuration
Having sent the request from SAT menu the DUT is in WAP session.
Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Send a request using SAT menu and start a WAP session.

Expected behaviour
The “new message received” notice shall be displayed on the screen and the sound of the new received SMS shall be heard.

57.1.8.9.12 Notification display for filling area menus

Description
Ensure that there is a notification for filling area related menus while sending requests to the local SAT application.

Related GSM core specifications
None

Reason for test
To ensure that the filling related menus work properly in the SAT Menu.

Initial configuration
MS starts a request from the local SAT application (e.g. the lottery interrogate service)
Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Send a request from the local SAT application (you should enter the digits on your ticket in this field))

Expected behaviour
After entering missing digits in this field, there should appear a notification on the screen, such as “at least x digits should be entered”.

57.1.8.9.13 Predictive Text Input to type text in an input dialog screen (Get Input proactive command)

Description
Ensure that the DUT supports the Predictive Text Input to type text in an input dialog screen (get input)

Related GSM core specifications
None

Reason for test
To ensure that the user can use the Predictive Text Input to type text in an input dialog screen.

Initial configuration
MS starts a request from the local SAT application (e.g. the lottery interrogate service)

Where possible, use as many of the following types:
• A SIM (ICC)
• A UICC with SIM only
• A UICC with SIM and USIM

Test procedure
Type text in the get input.

Expected behaviour
The DUT shall support the possibility to activate/deactivate the Predictive Text Input.

57.1.8.9.14 Use of special characters to type text in an input dialog screen (Get Input proactive command)

Description
Ensure that the DUT supports special characters (e.g. @, commas, case sensitive etc.) while typing text in an input dialog screen (get input)

Related GSM core specifications
None

Reason for test
To ensure that the user can insert special characters when inserting a text input in an input dialog screen.

Initial configuration
MS starts a request from the local SAT application (e.g. the lottery interrogate service)

Where possible, use as many of the following types:
• A SIM (ICC)
Test procedure
Fill in the input dialog screen.

Expected behaviour
The DUT shall support the possibility to insert special characters.

57.1.8.9.15 Receiving a SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu) while handset application is running

Description
To ensure that the DUT displays the incoming message (SMS with envelope command ‘display text / get input / menu selection / setup menu’) even if a handset application (for example a game) is using screen resources.

Related GSM core specifications
None

Reason for test
To ensure that the DUT receives/displays the incoming message (SMS with envelope command) even if a handset application is running.

Initial configuration
Sends a SAT request to the network and execute an application before the reception of the SMS of replay from the network (SMS with envelope command).

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Maintain handset application running.

Expected behaviour
When the DUT receives the answer form the network (SMS with envelope command) the DUT displays the text related to the SMS with envelope command.

57.1.8.9.16 Interaction between SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu) and incoming call

Description
Ensure that if the MS, which shows on the display the message related to received SMS with envelope command (display text / get input / menu selection / setup menu), receives an incoming call it continues showing the message on the display even if the call is accepted.

Related GSM core specifications
None

Reason for test
Ensure that if the DUT receives an incoming call while displaying the message related to the content of the received SMS (with envelope command ‘display text / get input / menu selection / setup menu’),
it continues showing the message on the display even if the call is accepted, so that the user can complete the transaction.

**Initial configuration**

In idle mode the DUT displays the text related to the received SMS with envelope command.

**Test procedure**

Receive an incoming call and accept the call

**Expected behaviour**

The DUT shall continue showing the message so that the user can interact furthermore with the application.

### 57.1.8.9.17 Interaction between SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu) and WAP Push

**Description**

Ensure that if the DUT receives a WAP Push while displaying the text related to received SMS with envelope command ‘display text / get input / menu selection / setup menu’, it is possible to postpone the access to the WAP page and the DUT continues showing the message on the display.

**Related GSM core specifications**

None

**Reason for test**

To ensure that if the MS, which shows on the display the message related to received SMS with envelope command ‘display text / get input / menu selection / setup menu’, receives a WAP Push it continues showing the message on the display (it must be possible to postpone the access to URL in WAP Push) so that the user can complete the SAT transaction.

**Initial configuration**

In idle mode the DUT displays the text related to the SMS with envelope command received.

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

**Test procedure**

Receive a WAP Push and postpone the access to the WAP service

**Expected behaviour**

The DUT shall continue showing the text so that the user can interact furthermore with the application.

### 57.1.8.9.18 Interaction between SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu) and SMS

**Description**

To ensure that if the DUT receives an SMS while displaying the text related to the received SMS with envelope command (display text / get input / menu selection), it continues showing the message on the display.

**Related GSM core specifications**

None
Reason for test
Ensure that if the DUT receives an SMS (from another MS) while displaying the text related to a
received SMS with envelope command ‘display text / get input / menu selection / setup menu’, it
continues showing the text on the display so that the user can complete the SAT transaction.

Initial configuration
In idle mode the DUT displays the message related to the received SMS with envelope command.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
MS receives an SMS from another MS

Expected behaviour
The DUT shall continue showing the message so that the user can complete the SAT transaction.

57.1.8.9.19 Opening/closing the DUT flip: interaction with SM Mobile
Terminated with envelope command (display text / get input / menu selection / setup menu)

Description
To ensure that if the subscriber opens/close the flip while the DUT is displaying the text related to the
received SMS with envelope command (display text / get input / menu selection / setup menu), the
DUT continues showing the message on the display

Related GSM core specifications
None

Reason for test
To ensure that the text displayed doesn’t go lost when the flip is close/opened, so that the subscriber
can complete the transaction.

Initial configuration
In idle mode the DUT displays the message related to the received SMS with envelope command.
Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Close/open the flip of the DUT (if present)

Expected behaviour
After the opening of the flip the DUT shall continue showing the message so that the subscriber can
complete the SAT transaction.
57.1.8.9.20 Accepting an incoming call between the SAT request and the reception of SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu)

Description
To ensure that the DUT displays the incoming message (SMS with envelope command ‘display text / get input / menu selection / setup menu’ even if between the request and the answer from the network, a MT call incomes (the subscriber accepts the call)

Related GSM core specifications
None

Reason for test
To ensure that the DUT receives/displays the incoming message (SMS command ‘display text / get input / menu selection / setup menu’) even if between the access and the answer from the server, a MT call incomes (the user accepts the call)

Initial configuration
MS sends SAT request to the network and receive an incoming call before the reception of the SMS of replay from the network.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Accept the call.

Expected behaviour
When the DUT receives the answer form the network (SMS with envelope command) the DUT displays the text related to the SMS.

57.1.8.9.21 Rejecting an incoming call between the SAT request and the reception of a SM Mobile Terminated with envelope command (display text / get input / menu selection / setup menu)

Description
To ensure that the DUT displays the incoming message (SMS with envelope command ‘display text / get input / menu selection / setup menu’) even if between the request and the answer from the network, a MT call incomes (the subscriber rejects the call)

Related GSM core specifications
None

Reason for test
To ensure that the DUT receives/displays the incoming message (SMS command ‘display text / get input / menu selection / setup menu’) even if between the access and the answer from the server, a MT call incomes (the user rejects the call)

Initial configuration
MS sends a SAT request to the network and receive an incoming call before the reception of the SMS of replay from the network.

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Reject the call.

Expected behaviour
When the DUT receives the answer from the network (SMS with envelope command) the DUT displays the text related to the SMS.

57.1.8.9.22 Reception of an SMS Terminated from another DUT between the SAT request and the reception of the SMS of replay from the network (SM Mobile Terminated with envelope command display text / get input / menu selection)

Description
To ensure that the DUT displays the incoming message (SMS with envelope command ‘display text / get input / menu selection / setup menu’) even if between the request and the answer from the network, a SM Mobile Terminated from another DUT is received.

Related GSM core specifications
None

Reason for test
To ensure that the DUT receives/displays the incoming message (SMS with envelope command) even if between the access and the answer from the server, a SM Mobile Terminated is received.

Initial configuration
Sends a SAT request to the network and receive a SM Mobile Terminated from another DUT before the reception of the SMS of replay from the network (SMS with envelope command).

Where possible, use as many of the following types:
- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Read the SM Mobile Terminated received from another MS.

Expected behaviour
When the DUT receives the answer from the network (SMS with envelope command) the DUT displays the text related to the SMS with envelope command.

57.1.8.9.23 Receiving a WAP Push between the SAT request and the reception of the SM Mobile Terminated with envelope / setup menu (display text / get input / menu selection)

Description
To ensure that the DUT displays the incoming message (SMS with envelope command ‘display text / get input / menu selection / setup menu’) even if between the request and the answer from the network, a WAP Push is received.

Related GSM core specifications
None

Reason for test
To ensure that the DUT receives/displays the incoming message (SMS command with envelope command) even if between the access and the answer from the network a WAP Push is received.
Initial configuration
Sends a SAT request to the network and receive a WAP Push before the reception of the SMS of replay from the network (SMS with envelope command).

Where possible, use as many of the following types:

- A SIM (ICC)
- A UICC with SIM only
- A UICC with SIM and USIM

Test procedure
Accept the WAP Push.

Expected behaviour
When the DUT receives the answer form the network (SMS with envelope command) the DUT displays the text related to the SMS with envelope command.

57.2 (U)ICC with SIM specific test cases

57.2.1 Mobile support of GPRS unaware SIM cards and GPRS aware SIM cards with GPRS Elementary Files

Description
Procedure to check the correct storage of EF_loCiGPRS and EF_kcGPRS

Related GSM core specifications
GSM 11.11 v 8.3.0 sub clause 10.3.7, 10.3.32 and 10.3.33 (ETSI TS 100977)
GSM 03.60 sub clause 13.4

Reason for test
To test the storage procedure with a SIM that is a:
- GPRS aware SIM; indicated by EF_SST service number 38 (activated and allocated) and has EF_loCiGPRS and EF_kcGPRS allocated in the SIM.
- GPRS not aware SIM; indicated by EF_SST service number 38 with value not allocated and not activated.

If the SIM is GPRS-aware, the P-TMSI, P-TMSI Signature value, Routing Area Information, Routing area update status, KcGPRS, and CKSN_GPRS stored in the SIM shall be used when accessing the GPRS services.

And
If the SIM is not GPRS-aware, then the P-TMSI, P-TMSI Signature, Routing Area Information, Routing area update status, KcGPRS, and CKSN_GPRS stored in the SIM shall be used if and only if the IMSI stored in the SIM is identical to the IMSI image maintained in the ME. If the IMSI stored in the SIM is different from the IMSI image in the ME, then the IMSI image in the ME shall not be used, and the DUT shall identify itself with the IMSI stored in the SIM when performing a GPRS attach. IMSI, P-TMSI, P-TMSI Signature, Routing Area, Kc, and CKSN may be stored in the ME after the GPRS attach has been successfully performed.

Initial configuration
1. MS with GPRS aware SIM with the EF_loCiGPRS and EF_kcGPRS cleared and switched off.
2. MS with a GPRS not aware SIM switched off.
3. 2G only.
Test procedure

1.  
   A. Switch the DUT on.  
   B. Attempt a PDP context.  
   C. Switch the DUT off.  
   D. Using a SIM card reader, verify the contents of the EF_{locGPRS} and EF_{kcGPRS} data field in the SIM.

2.  
   A. Switch the DUT on.  
   B. Attempt a PDP context  
   C. Switch the DUT off.

Expected behaviour

1. With a GPRS aware SIM the content of EF_{locGPRS} and EF_{kcGPRS} shall have been updated.  
1. and 2. The PDP context shall be successfully attempted in all cases.

57.2.2 Language Preference (LP)

Description
Procedure to check the correct support of EF_{LP}

Related GSM core specifications
GSM 11.11 v 8.* sub clause 10.1.2, 10.3.1, 11.2.1 (ETSI TS 100977)

Reason for test
To test that the DUT supports during switch on the activation of the first language which is supported in the DUT presented by EF_{LP} or EF_{ELP} (if available).

Initial configuration
The SIM has to support the following elementary files:
- EF_{LP} (Language preference)
The SIM may support the following elementary file:
- EF_{ELP} (Extended Language preference)
The SIM is connected to the DUT and the device is switched on. The languages supported shall be noted. The Menu language shall be set to “Automatic” (if available).
The SIM shall be removed from the device. With an external card reader EF_{LP} shall be modified:
- EF_{LP} (1) = <Any Not supported language>
- EF_{LP} (2) = <Any supported language which is not the official language used in the country of the SIM's Mobile Country Code (MCC), e.g. do not use German for MCC=262>
- EF_{LP} (3) = <Any supported language>
- EF_{LP} (4) = <Any supported language>
If EF_{ELP} is available all records of this file shall be deleted using an external card reader:
- EF_{ELP} (*) = 0xFFFF
The PIN shall be activated in the SIM.

Test procedure
The SIM is placed in the device and this DUT is switched on.
57.2.3 E-UTRA terminals with UICC with SIM

Description
Verify DUT correct behaviour in case of 2G SIM (or UICC with SIM application only)

Related core specifications
TS 36.304 sub clause 4.1
TS 33.401 sub clause 6.1.1

Reason for test
To ensure that device will not attempt to camp on E-UTRA in case if only 2G SIM (or a SIM application only on a UICC) is available.

Initial configuration
DUT is powered off
2G SIM card is available (or UICC with SIM Application only).

Test procedure
Power on the UE.

Expected behaviour
Upon detection of invalid USIM, DUT shall disable all its EUTRAN capabilities until switched off and shall not attempt ATTACH procedure.

57.3 USIM specific test cases

57.3.1 Authentication / Ciphering

Description
A mobile originated speech call with ciphering and authentication is performed.

Related core specifications
3GPP TS 31.102, 3GPP TS 33.102, 3GPP TS 24.008, 3GPP TS25.331, ETSI TS 102 221

Reason for test
To ensure that a DUT performs authentication and ciphering successfully when a CS service is activated.

Initial configuration
To perform this test case the DUT has to support a trace mode to log the layer 3 signalling.
The DUT is switched on in UTRAN environment with sufficient FDD coverage, so no cell reselection to GSM is performed.

Test procedure
1) The DUT is switched on and the PIN entered on request.
2) A mobile originated speech call to any destination is established. The call is accepted by the called party. Then it is checked that the speech is of acceptable quality. The call is released afterwards.

Expected behaviour
1) The DUT may prompt for the PIN and accept when the correct PIN entered. The DUT displays service in the network.
2) The signalling is checked in the log file. The UMTS authentication challenge is performed successfully:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Authentication Request (Ciphering key sequence number, RAND, AUTN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Authentication Response (RES)</td>
<td></td>
</tr>
</tbody>
</table>

Ciphering is activated:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Security Mode Command (Ciphering Algorithm=UEA1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security Mode Complete</td>
<td></td>
</tr>
</tbody>
</table>

The speech quality was of acceptable quality.

57.3.2 Preferred Languages (PL)

Description

Procedure to check the correct support of EF\textsubscript{PL}

Related core specifications

TS 31.102, ETSI TS 102 221.

Reason for test

To ensure that a DUT reads and interprets EF\textsubscript{PL} before the PIN is entered.

Initial configuration

The UICC has to support the following elementary files:

- EF\textsubscript{PL} (Preferred Languages)

The UICC is connected to the device. The device is switched on. The languages supported shall be noted. The Menu language shall be set to “Automatic” (if available).

The UICC shall be removed from the device. With an external card reader EF\textsubscript{PL} (if available EF\textsubscript{LI}) shall be modified:

- EF\textsubscript{PL} (1) = <Any Not supported language>
- EF\textsubscript{PL} (2) = <Any supported language which is not the official language used in the country of the SIM’s Mobile Country Code (MCC), e.g. do not use German for MCC=262>
- EF\textsubscript{PL} (3) = <Any supported language>
- EF\textsubscript{PL} (4) = <Any supported language>

The PIN shall be activated in the UICC.

Test procedure

The UICC is placed in the device. The device is switched on.

Expected behaviour

The device prompts for entering the PIN in the language as defined in EF\textsubscript{PL} (2) during configuration.

57.3.3 Phonebook tests

NOTE: The UICC with USIM should be fully featured and a number of phonebook entries on UICC with USIM should already exist, even if the DUT does not support a subset of those features. UICCs with USIM from various operators/suppliers should be tested.
57.3.3.1 Support of Grouping Information

Description

Procedure for testing support of Grouping Information in $E_{GAS}$.

Related 3GPP core specifications

3GPP TS 31.102

Reason for test

To ensure that

Initial configuration

The UICC with USIM has to support the following elementary files:

- $E_{ADN}$ (Abbreviated dialling numbers)
- $E_{GRP}$ (Grouping file)
- $E_{GAS}$ (Grouping information Alpha String)
- $E_{PBR}$ (Phone Book Reference file)

To perform this test case an external card reader/writer for UICCs with USIM is required. With this external card reader the following ADN records are created:

- Alpha Identifier = “Group1TelephoneN”, BCD Number = <first telephone number>
- Alpha Identifier = “Group2TelephoneN”, BCD Number = <second telephone number>

At least one ADN record shall be empty.

With the external card reader the following $E_{GAS}$ records are created:

- $E_{GAS}$ (1) = "Group No 1"
- $E_{GAS}$ (2) = "Group No 2"

With the external card reader the following $E_{GRP}$ records are set:

- $E_{GRP}$ (<Record No of ADN “Group1TelephoneN”>) = 1
- $E_{GRP}$ (<Record No of ADN “Group2TelephoneN”>) = 2

The UICC (with USIM) is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

Test procedure

1. Select the phone book entry “Group1TelephoneN”. Check to which group this ADN belongs.
2. Select the phone book entry “Group2TelephoneN”. Check to which group this ADN belongs.
3. Add a new phone book entry with the alpha identifier “AssignToGroup2” with any telephone number. Assign this ADN to group “Group No 2”
4. Select the phone book entry “Belonging2Group2” and assign this ADN to group “Group No 1”
5. Select the phone book entry “Belonging2Group1” and de-assign the group for this ADN. Afterwards leave the phonebook, select the phone book entry “Group1TelephoneN” and Check to which group this ADN belongs.
6. Remove the UICC from the device and place it into another device supporting grouping information.
7. Select the phone book entry “Group1TelephoneN”. Check to which group this ADN belongs.
8. Select the phone book entry “Group2TelephoneN”. Check to which group this ADN belongs.
9. Select the phone book entry “AssignToGroup2”. Check to which group this ADN belongs.
Expected behaviour
1. The DUT shall indicate that ADN “Group1TelephoneN” belongs to group “Group No 1”.
2. The DUT shall indicate that ADN “Group2TelephoneN” belongs to group “Group No 2”.
3. The new ADN “AssignToGroup2” can be assigned to group “Group No 2”.
4. The ADN “Group2 TelephoneN” can be assigned to group “Group No 1”.
5. After de-assigning the group for “Group1TelephoneN” this ADN shall no longer belong to a group.
6. -
7. The DUT shall indicate that ADN “Group1TelephoneN” does not belong to any group.
8. The DUT shall indicate that ADN “Group2TelephoneN” belongs to group “Group No 1”.
9. The DUT shall indicate that ADN “AssignToGroup2” belongs to group “Group No 2”.

57.3.3.2 Support of EMAIL

Description
Procedure for testing support of eMail addresses in EF_{eMail}.

Related 3GPP core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports the elementary file EF_{eMail} (eMail) in the UICC with USIM.

Initial configuration
The UICC with USIM has to support the following elementary files:

- EF_{ADN} (Abbreviated dialling numbers)
- EF_{IAP} (Index Administration Phone book)
- EF_{eMail} (E-mail address)
- EF_{PBR} (Phone Book Reference file)

To perform this test case an external card reader/writer for UICCs with USIM is required. With this external card reader the following ADN records are created:

- Alpha Identifier = “eMail1TelephoneN”, BCD Number = <any telephone number>
- Alpha Identifier = “eMail2TelephoneN”, BCD Number = <any telephone number>

At least one ADN record shall be empty.

With the external card reader the following EF_{eMail} records are defined:

- EF_{eMail} (1) = <any valid eMail address>
- EF_{eMail} (2) = <any valid eMail address different from EF_{eMail} (1)>

With the external card reader the EF_{IAP} record is defined:

- EF_{IAP} (<Record No of ADN “eMail1TelephoneN”>) = <X bytes, see table>
The UICC (with USIM) is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

**Test procedure**

**Note:** If the terminal doesn’t allow to edit, add, delete or send e-mail from the contacts directly on/from the SIM card, when required copy first the contact from the SIM card to the DUT phonebook, send e-mail from the DUT phonebook, edit the contact in the DUT phonebook, copy the contact to the SIM card (in case of "delete", it may be needed to copy the complete DUT phonebook to the SIM card).

1. Select the phone book entry “eMail1TelephoneN”. Check the eMail address associated to this ADN.
2. Create a new eMail and send it to the eMail address associated to the ADN “eMail1TelephoneN”. Check that the eMail is received.
3. Change the eMail address associated to the ADN entry “eMail1TelephoneN”
4. Select the phone book entry “eMail2TelephoneN” and delete the eMail associated to this ADN.
5. Add a new phone book entry with the alpha identifier “New-eMail2” with any telephone number. Add a new eMail address to this ADN.
6. Leave the phone book. Select the phone book entry “New-eMail2”. Check the eMail address associated to this ADN.
7. Create a new eMail and send it to the eMail address associated to the ADN “New-eMail2”. Check that the eMail is received.
8. Remove the UICC from the device and place it into another device supporting EF\textsubscript{eMail}.
9. Select the phone book entry “eMail1TelephoneN”. Check the changed eMail address associated to this ADN.
10. Select the phone book entry “eMail2TelephoneN ”. Check that no eMail address is associated to this ADN.
11. Select the phone book entry “New-eMail2”. Check the eMail address associated to this ADN.

### Table 1: EF\textsubscript{IAP}

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If first object indicated after Tag 'A9' in EF\textsubscript{FPR} is 'CA' (eMail) THEN 1 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
<tr>
<td>2</td>
<td>If second object indicated after Tag 'A9' EF\textsubscript{FPR} is first 'CA' (eMail) reference THEN 1 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>X</td>
<td>If the X\textsuperscript{th} object indicated after Tag 'A9' in EF\textsubscript{FPR} is first 'CA' (eMail) reference THEN 1 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

### Table 2: EF\textsubscript{IAP} (<Record No of ADN "eMail2TelephoneN">) = <X bytes, see table>

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If first object indicated after Tag 'A9' in EF\textsubscript{FPR} is 'CA' (eMail) THEN 2 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
<tr>
<td>2</td>
<td>If second object indicated after Tag 'A9' EF\textsubscript{FPR} is first 'CA' (eMail) reference THEN 2 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>X</td>
<td>If the X\textsuperscript{th} object indicated after Tag 'A9' in EF\textsubscript{FPR} is first 'CA' (eMail) reference THEN 2 ELSE 'FF'</td>
<td>1 byte</td>
</tr>
</tbody>
</table>
**Expected behaviour**

1. The eMail address is as defined with external card reader.
2. The eMail is received by the correct eMail address.
3. The eMail address associated to the ADN entry "eMail1TelephoneN" can be changed.
4. The eMail address associated to the "eMail2TelephoneN" can be deleted.
5. An eMail address can be associated to the new ADN "New-eMail2".
6. The eMail address associated to ADN "New-eMail2" is as defined.
7. The eMail is received by the correct eMail address.
8. -
9. The eMail address associated to the ADN entry "eMail1TelephoneN" is as modified in step 3).
10. No eMail address is associated to ADN "eMail2TelephoneN".
11. The eMail address associated to the ADN entry "New-eMail2 is as defined.

### 57.3.3.3 Support of ANR (Additional Number)

**Description**

Procedure for testing support of eMail addresses in EF\textsubscript{ANR}.

**Related core specifications**

3GPP TS 31.102

**Reason for test**

To ensure that a DUT supports the elementary file EF\textsubscript{ANR} (Additional Number) in the UICC with USIM.

**Initial configuration**

The UICC with USIM has to support the following elementary files:

- EF\textsubscript{ADN} (Abbreviated dialling numbers)
- EF\textsubscript{IAP} (Index Administration Phone book)
- EF\textsubscript{ANR} (Additional Number)
- EF\textsubscript{PBR} (Phone Book Reference file)

To perform this test case an external card reader/writer for UICC with USIM is required. With this external card reader the following ADN records are created:

- Alpha Identifier = "ANR1TelephoneNum", BCD Number = < any telephone number different from #1 - #2>
- Alpha Identifier = "ANR2TelephoneNum", BCD Number = <any telephone number different from #1 - #2>

At least one ADN record shall be empty.

With the external card reader the following EF\textsubscript{ANR} records are defined:

- EF\textsubscript{ANR} (1) = <telephone number #1>
- EF\textsubscript{ANR} (2) = <any telephone number different from #1 - #2>

With the external card reader the EF\textsubscript{IAP} record is defined:

- EF\textsubscript{IAP} (<Record No of ADN "ANR1TelephoneNum") = <X bytes, see table>
Two telephones with the telephone number <telephone number #1> and <telephone number #2> are required to receive calls.

The UICC (with USIM) is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

**Test procedure**

Note: If the terminal doesn’t allow to edit, add, delete or dial the contacts directly on/from the SIM card, when required copy first the contact from the SIM card to the DUT phonebook, dial the numbers from the DUT phonebook, edit the contact in the DUT phonebook, copy the contact to the SIM card (in case of "delete", it may be needed to copy the complete DUT phonebook to the SIM card).

1. Select the phone book entry "ANRTelephoneNum". Check the additional number associated to this ADN.

2. Perform a MOC to the Additional Number associated with phone book entry "ANR1TelephoneNum" (<telephone number #1>). Check that the call can be performed and release it afterwards.

3. Change the additional number associated to the ADN entry "ANR1TelephoneNum"

4. Select the phone book entry “ANR2TelephoneNum” and delete the additional number associated to this ADN.

5. Add a new phone book entry with the alpha identifier “New-ANR2” with any telephone number different from telephone number #1 - #3. Add <telephone number #2> as a new additional number to this ADN.

6. Leave the phone book. Select the phone book entry “New-ANR2”. Check the additional number associated to this ADN.

7. Perform a MOC to the additional number associated to the ADN “New-ANR2” (telephone number #2). Check that the call can be performed and release it afterwards.

8. Remove the UICC from the device and place it into another device supporting EFANR.
9. Select the phone book entry “ANR1TelephoneNum”. Check the changed additional number associated to this ADN.

10. Select the phone book entry “ANR2TelephoneNum”. Check that no additional number is associated to this ADN.

11. Select the phone book entry “New-ANR2”. Check the additional number associated to this ADN is correct.

**Expected behaviour**

1. The additional number is as defined with external card reader.
2. The MOC could be performed to the correct destination.
3. The additional number associated to the ADN entry “ANR1TelephoneNum” can be changed.
4. The additional number associated to the “ANR2TelephoneNum” can be deleted.
5. An additional number can be associated to the new ADN “New-ANR2”.
6. The additional number associated to ADN “New-ANR2” is as defined.
7. The MOC could be performed to the correct destination.
8. -
9. The additional number associated to the ADN entry “ANR1TelephoneNum” is as modified in step 3).
10. No additional number is associated to ADN “ANR2TelephoneNum”.
11. The additional number associated to the ADN entry “New-ANR2” is as defined.

### 57.3.3.4 Support of Hidden Phonebook entries

**Description**

Procedure for testing support of hidden phonebook entries.

**Related core specifications**

3GPP TS 31.102

**Reason for test**

To ensure that a DUT supports the hidden information stored in elementary file EF_PBC (Phone Book Control) in the UICC with USIM.

**Initial configuration**

Two UICCs with USIM are required for this test. Both UICCs have to support the following elementary files:

- EF_ADN (Abbreviated dialling numbers)
- EF_PBR (Phone Book Reference file)
- EF_Hiddenkey (Hiddenkey)

To perform this test case an external card reader/writer for USIMs is required. With this external card reader the following ADN records are created in USIM #1:

- Alpha Identifier = “ADN1hidden”, BCD Number = <any existing telephone number>
- Alpha Identifier = “ADN2hidden”, BCD Number = <any telephone number>

At least one ADN record shall be empty.

With the external card reader reset the Hiddenkey in EF_Hiddenkey to “1234”.

With the external card reader the EF_PBC record is defined in USIM #1:

- EF_IAP (<Record No of ADN “ADN1hidden”>) = <X bytes, see table>
<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unchanged!</td>
<td>1 byte</td>
</tr>
<tr>
<td>2</td>
<td>'01' if only one USIM application is on the UICC.</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

- **EF_{IAP} (<Record No of ADN “ADN2hidden”>) = <X bytes, see table>**

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unchanged</td>
<td>1 byte</td>
</tr>
<tr>
<td>2</td>
<td>'01' if only one USIM application is on the UICC.</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

With the external card reader reset the Hiddenkey in EF_{Hiddenkey} to “FF…FF”.

Place USIM #2 in the device and switched this DUT on either in GSM or UTRAN environment with sufficient coverage.

Activate display of hidden phonebook entries. Switch the DUT off.

The USIM #1 is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

**Test procedure**

1. Search for the phone book entry “ADN1hidden” and “ADN2hidden”. Check that both ADNs are not displayed.

2. Activate display of hidden phonebook entries. Enter the Hiddenkey “1234” on request.

3. Select the phone book entry “ADN1hidden” and perform a MOC to this telephone number.

4. Select the phone book entry “ADN2hidden” and deactivate hiding of this ADN. Enter the Hiddenkey “1234” on request.

5. Add a new phone book entry with the alpha identifier “NewHiddenEntry” with any telephone number. Activate hiding of this ADN. Enter the Hiddenkey “1234” on request.

6. Change the hidden key to “7777”. Enter the old hidden key “1234” and the new key. Repeat entering the new hidden key on request.

7. Deactivate display of hidden phonebook entries. Enter the old Hiddenkey “1234” when requested to enter the Hiddenkey.

8. Enter the Hiddenkey “7777” on request.

9. Search for the phone book entry “ADN1hidden”, “ADN2hidden” and “NewHiddenEntry”. Check that only “ADN2hidden” can be displayed.

10. When Hiddenkey reset to “FF..FF” insert a new ADNhidden.

**Expected behaviour**

1. Neither phone book entry “ADN1hidden” nor “ADN2hidden” can be displayed.

2. The DUT prompts for the Hiddenkey while activating display of hidden phonebook entries.

3. A MOC can be performed to the telephone number stored in phone book entry “ADN1hidden”.

4. The DUT prompts for the Hiddenkey during deactivation of hiding this ADN.

5. The DUT prompts for the Hiddenkey during activation of hiding this ADN.

6. The DUT prompts for the old Hiddenkey and twice for the new Hiddenkey.

7. The DUT prompts for the Hiddenkey during deactivation of hiding of ADNs. The DUT shall reject the entered Hiddenkey and prompt to enter a new one.

8. The DUT shall accept the new Hiddenkey.

9. “ADN2hidden” can be displayed. “ADN1hidden” and “NewHiddenEntry” are hidden and cannot be displayed.
10. DUT checks that Hiddenkey is null and request the user to introduce a new Hiddenkey. Once this is defined entered, the new ADNhidden can be stored.

57.3.3.5 Support of SNE (Second Name)

Description
Procedure for testing support of second name entry addresses in $E_{FSNE}$.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports the elementary file $E_{FSNE}$ (Second Name) in the UICC with USIM.

Initial configuration
The UICC with USIM has to support the following elementary files:

- $E_{ADN}$ (Abbreviated dialling numbers)
- $E_{IAP}$ (Index Administration Phone book)
- $E_{SNE}$ (Second Name Entry): The amount of second name entries may be less than or equal to the amount of records in $E_{ADN}$. Each record contains a second name entry

Test procedure
1. The DUT is switched on
2. Insert a new entry on the phonebook
   
<table>
<thead>
<tr>
<th>Alpha Identifier</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXXXXXXX</td>
<td>+34123456789</td>
</tr>
</tbody>
</table>

3. The ME shall ask for a second name entry
   
<table>
<thead>
<tr>
<th>Alpha Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>YYYYYY</td>
</tr>
</tbody>
</table>

4. The USIM is removed from the DUT and checked in an external card reader:

   Expected behaviour
   1. The new entry was added in to the ADN
      
      | Record Number | Alpha Identifier | Number       |
      |---------------|------------------|-------------|
      | XXXXXXXX      |                 | +34123456789|

   2. The second name entry was added in to the SNE file
      
      | Alpha Identifier | Short file identifier | ADN file Record Identifier |
      |------------------|------------------------|-----------------------------|
      | YYYYYY           | 01                     | 10                          |

   3. Check that ADN file Record Identifier coincide with Record Number in ADN file
   4. The card is inserted in to the ME again
   5. Look for the ADN “XXXXXXXX“
   6. The DUT must display “XXXXXXXX, YYYYYY and +34123456789“ values
57.3.4 Support of Call Information (ICI, OCI)

Description
Procedure for testing support Incoming and Outgoing Call Information fields on the USIM

Related core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports the elementary file $\text{EF}_{\text{ICI}}$ (Incoming Call Information) and $\text{EF}_{\text{OCI}}$ (Outgoing Call Information).

Initial configuration
The USIM has to support the following elementary files:

- $\text{EF}_{\text{ADN}}$ (Abbreviated dialling numbers)
- $\text{EF}_{\text{ICI}}$ (Incoming Call Information)
- $\text{EF}_{\text{OCI}}$ (Outgoing Call Information)

Service #8 and #9 have to be activated in $\text{EF}_{\text{UST}}$ (USIM Service Table).

CLIP has to be subscribed for the USIM used for this test.

Three different telephone subscriptions with the telephone number $<\text{MSISDN } #1>$, $<\text{MSISDN } #2>$ and $<\text{MSISDN } #3>$ are required to send and receive calls. CLIR shall not be active for these phones, i.e. the MSISDN is included in the SETUP.

With an external card reader or a different phone the following ADN records are created:

- Alpha Identifier = "Telephone2", BCD Number = $<\text{MSISDN } #2>$ in international format
- Alpha Identifier = "Telephone3", BCD Number = $<\text{MSISDN } #3>$ in national format

It must be ensured that $<\text{MSISDN } #1>$ is not stored in any ADN record neither in national nor international format.

The USIM is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

Note: The term "Incoming Call Information list", "Outgoing Call Information list" and "Missed Call Information list" may be implemented as separate lists or as one common list where the user is informed about the status of each call, i.e. Incoming, Outgoing or Missed

Test procedure
1. The Incoming and Outgoing Call Information list shall be deleted.
2. A mobile terminated call is performed from $<\text{MSISDN } #1>$. The call is accepted and released afterwards. Then the Incoming Call Information list is checked for the available numbers.
3. A mobile terminated call is performed from $<\text{MSISDN } #2>$. The call is accepted and released afterwards. Then the Incoming Call Information list is checked for the available numbers.
4. A mobile terminated call is performed from $<\text{MSISDN } #3>$. The call is accepted and released afterwards. Then the Incoming Call Information list is checked for the available numbers.
5. A mobile terminated call is performed from $<\text{MSISDN } #1>$. The call is not accepted on the DUT and released on the originated side. Then the Incoming Call Information list is checked for the available numbers.
6. A mobile terminated call is performed from $<\text{MSISDN } #2>$. The call is not accepted on the DUT and released on the originated side. Then the Incoming Call Information list is checked for the available numbers.
7. A mobile terminated call is performed from $<\text{MSISDN } #3>$. The call is not accepted on the DUT and released on the originated side. Then the Incoming Call Information list is checked for the available numbers.
8. A mobile originated call is performed to <MSISDN #1>. The call is accepted and released afterwards. Then the Outgoing Call Information list is checked for the available numbers.

9. A mobile originated call is performed to <MSISDN #2> in national format (The phone book is not used). The call is accepted and released afterwards. Then the Outgoing Call Information list is checked for the available numbers.

10. A mobile originated call is performed to <MSISDN #3> in international format (The phone book is not used). The call is accepted and released afterwards. Then the Outgoing Call Information list is checked for the available numbers.

11. The USIM is removed from the DUT and put in another DUT supporting EFICI and EFOCI. The Incoming, Outgoing and Missed Call Information list is checked for available numbers.

Expected behaviour

1. The Incoming and Outgoing Call Information list shall be deleted successfully.

2. The Incoming Call Information list shall include <MSISDN #1> and correct date and time when the call was received. Additionally the call duration may be displayed.

3. The Incoming Call Information list shall include <MSISDN #1> and “Telephone2” and correct date and time when the calls were received. For “Telephone2” the MSISDN may be displayed additionally to the ADN Alpha identifier. Additionally the call duration may be displayed for each entry.

4. The Incoming Call Information list shall include <MSISDN #1>, “Telephone2” and “Telephone3” and correct date and time when the calls were received. For “Telephone2” and “Telephone3” the MSISDN may be displayed additionally to the ADN Alpha identifier. Additionally the call duration may be displayed for each entry.

5. The DUT indicates that a call was missed. The Missed Call Information list shall include <MSISDN #1> and correct date and time when the call was missed.

6. The DUT indicates that a call was missed. The Missed Call Information list shall include <MSISDN #1> and “Telephone2” and correct date and time when the calls were missed. For “Telephone2” the MSISDN may be displayed additionally to the ADN Alpha identifier.

7. The DUT indicates that a call was missed. The Missed Call Information list shall include <MSISDN #1>, “Telephone2” and “Telephone3” and correct date and time when the calls were missed. For “Telephone2” and “Telephone3” the MSISDN may be displayed additionally to the ADN Alpha identifier.

8. The Outgoing Call Information list shall include <MSISDN #1> and correct date and time when the call was performed. Additionally the call duration may be displayed.

9. The Outgoing Call Information list shall include <MSISDN #1> and “Telephone2” and correct date and time when the calls were performed. For “Telephone2” the MSISDN may be displayed additionally to the ADN Alpha identifier. Additionally the call duration may be displayed for each entry.

10. The Outgoing Call Information list shall include <MSISDN #1>, “Telephone1” and “Telephone2” and correct date and time when the calls were performed. For “Telephone1” and “Telephone2” the MSISDN may be displayed additionally to the ADN Alpha identifier. Additionally the call duration may be displayed for each entry.

11. The Incoming, Outgoing and Missed Call Information list shall contain each <MSISDN #1>, <MSISDN #2> and <MSISDN #3>. For each entry the correct date and time when the calls were received, performed or missed shall be displayed. Additionally the call duration may be displayed for each entry in the Incoming and Outgoing Call Information list. “Telephone1” and “Telephone2” may be displayed instead of its MSISDNs.

57.3.5 Support of Timers (ICT, OCT)

Description

Procedure for testing support Incoming and Outgoing Call Timer fields on the USIM
Related core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports the elementary file $E_{ICT}$ (Incoming Call Timer) and $E_{OCT}$ (Outgoing Call Timer).

Initial configuration
The USIM has to support the following elementary files:

- $E_{ADN}$ (Abbreviated dialling numbers)
- $E_{ICT}$ (Incoming Call Timer)
- $E_{OCT}$ (Outgoing Call Timer)

Service #8 and #9 have to be activated in $E_{UST}$ (USIM Service Table).

One telephone subscriptions with the telephone number $<\text{MSISDN #1}>$ is required to send and receive calls.

With an external card reader

- $E_{ICT}$ is initialised with values $<\text{initial ICT value}>$
- $E_{OCT}$ is initialised with values $<\text{initial OCT value}>$

$<\text{initial ICT value}>$ and $<\text{initial OCT value}>$ shall be different. Depending on the administration of the USIM the PIN2 code may be needed.

A watch is needed to measure the time for incoming and outgoing calls.

Test procedure
1. The menu function is selected where the incoming call timers can be displayed.
2. The menu function is selected where the outgoing call timers can be displayed.
3. An outgoing call is performed to $<\text{MSISDN #1}>$. The call is performed for a while and then released. The time between hook off and hook on is measured and noted.
4. The menu function is selected where the incoming call timers can be displayed.
5. An incoming call is performed from $<\text{MSISDN #1}>$. The call is performed for a while and then released. The time between hook off and hook on is measured and noted.
6. The menu function is selected where the outgoing call timers can be displayed.
7. The USIM is removed from the DUT and the values for $E_{ICT}$ and $E_{OCT}$ are checked with an external card reader.
8. The USIM is placed back to the UE. The menu function for resetting the incoming call timer and outgoing call timer is selected and incoming and outgoing call timer is reset. Depending on the administration of the USIM the PIN2 code may be needed. When prompted for PIN2 the PIN2 code is entered.
9. An outgoing call is performed to $<\text{MSISDN #1}>$. The call is performed for a while and then released. The time between hook off and hook on is measured and noted.
10. The menu function is selected where the incoming call timers can be displayed.
11. An incoming call is performed from $<\text{MSISDN #1}>$. The call is performed for a while and then released. The time between hook off and hook on is measured and noted.
12. The menu function is selected where the outgoing call timers can be displayed.

Expected behaviour
1. The DUT displays $<\text{initial ICT value}>$ as accumulated incoming call timer values. The value shall be presented in days, hours, minutes and seconds.
2. The DUT displays <initial OCT value> accumulated outgoing call timer values. The value shall be presented in days, hours, minutes and seconds.

3. After release of the call the DUT displays the correct duration of the outgoing call.

4. The DUT displays <<initial ICT value>+duration of incoming call> as accumulated incoming call timer values. The value shall be presented in days, hours, minutes and seconds.

5. After release of the call the DUT displays the correct duration of the incoming call.

6. The DUT displays <<initial OCT value>+duration of outgoing call> accumulated outgoing call timer values. The value shall be presented in days, hours, minutes and seconds.

7. The DUT displays <<initial OCT value>+duration of outgoing call> accumulated outgoing call timer values. The value shall be presented in days, hours, minutes and seconds.

8. The DUT displays <<initial ICT value>+duration of incoming call> as accumulated incoming call timer values. The value shall be presented in days, hours, minutes and seconds.

9. After release of the call the DUT displays the correct duration of the outgoing call.

10. The DUT displays <duration of incoming call> as accumulated incoming call timer values. The value shall be presented in days, hours, minutes and seconds.

11. After release of the call the DUT displays the correct duration of the incoming call.

12. The DUT displays <duration of outgoing call> accumulated outgoing call timer values. The value shall be presented in days, hours, minutes and seconds.

57.3.6 Display of Service Provider Name (SPN)

Description
Procedure for correct display of Service Provider Name stored on the USIM

Related core specifications
3GPP TS 31.102

Reason for test
To ensure that the DUT correctly displays the Service Provider Name stored in the elementary file EFSPN (Service Provider Name).

Initial configuration
The USIM has to support the following elementary files:

- EFSPN (Service Provider Name)

One telephone subscription with the telephone number <MSISDN #1> is required to send and receive calls.

For these tests USIMs with the following different EFSPN values are needed:

- a) Byte #1=0, Bytes #2-16= <Service Provider Name> coded as 7 bit coded value, unused bytes shall be set to 'FF'.
- b) Byte #1=1, Bytes #2-16= <Service Provider Name> coded as 7 bit coded value, unused bytes shall be set to 'FF'.
- c) Byte #1=0, Bytes #2-15= <Service Provider Name> (Length = 8 characters) coded as UCS2 coded value. Unused byte 16 shall be coded as 'FF'.
- d) Byte #1=1, Bytes #2-16= <Service Provider Name> (Length = 8 characters) coded as UCS2 coded value. Unused byte 16 shall be coded as 'FF'.

Test procedure
With every USIM No a) - d) the following test procedures are performed.
1. The USIM is connected with the ME. The DUT is switched on.

2. A mobile originated call to <MSISDN #1> is performed. The call is accepted by <MSISDN #1> and released afterwards.

3. A mobile terminated call from <MSISDN #1> is performed. The call is accepted by the DUT and released afterwards.

**Expected behaviour**

1. The DUT performs a location update and displays service. Depending on the USIM used the following is presented on the display:
   a. The DUT displays <Service Provider Name> correctly. Additionally the DUT may display the name of the registered PLMN.
   b. The DUT displays both <Service Provider Name> and the name of the registered PLMN correctly
   c. The DUT displays the UCS2 coded <Service Provider Name> correctly. Additionally the DUT may display the name of the registered PLMN.
   d. The DUT displays both <Service Provider Name> (UCS2 coded) and the name of the registered PLMN correctly

2. After release of the call the DUT shall display the service provider name as listed in step 1.

3. After release of the call the DUT shall display the service provider name as listed in step 1.

### 57.3.7 APN Control List (ACL)

**Description**

Procedure for testing support of APN Control List on the USIM

**Related core specifications**

3GPP TS 31.102

**Reason for test**

To ensure that a DUT supports the elementary file EFACL (APN Control List) correctly.

**Initial configuration**

The USIM has to support the following elementary files:

- **EFACL** (APN Control List)
- **EFEST** (Enabled Services Table)

Service #3 has to be activated in EFEST (Enabled Services Table).

With an external card reader

- **EFACL** is initialised with the following APNs (Access Point Names):
  - 1**th** APN: <Any non-existing APN>
  - 2**nd** APN: <Any valid WAP APN>

The DUT WAP configuration is set up to use <Any valid WAP APN> as WAP APN.

**Test procedure**

1. The DUT is switched on and a WAP connection is setup.

2. The Menu function for editing the APN Control List is selected. The APN <Any valid WAP APN> is deleted. PIN2 is entered when prompted by the UE.

3. It is tried to set up a WAP connection.

4. The USIM is removed from the DUT and the entry of EFACL is checked with an external card reader.
Expected behaviour
1. The WAP connection could be set up successfully.
2. The DUT prompts for PIN2 and the APN <Any valid WAP APN> could be deleted.
3. The DUT does not set up a WAP connection but displays that this is not possible due to an APN restriction.
4. EF_{ACL} contains the APN <Any non-existing APN> stored during initialisation as the only APN.

57.3.8 MMS provisioning

57.3.8.1 MMS notification usage

Description
Procedure for testing support of MMS notification storage.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure
- A DUT reads and interprets MMS notification storages on the USIM.
- The DUT updates EF_{MMSN} and EXT8 in the USIM.

Initial configuration
The USIM has to support the following elementary files:
- EF_{MMSN} (Abbreviated dialling numbers)
- EF_{EXT8} (Incoming Call Timer)

Service #52 and #53 have to be activated in EF_{UST} (USIM Service Table).

Test procedure
The DUT receives an MMS notification from the network.

Expected behaviour
The handset stores the received notification on the MMSN file. If the number of bytes exceeded the limit of the file register, the handset store the extra bytes on the EXT8 file existing on the card.

57.3.8.2 MMS Issuer Connectivity Parameters usage

Description
Procedure to check if the MMS User Agent uses the MMS related information stored in the USIM. Some of these information, in fact, are pre-set by the issuer of the USIM with the first supported set being the default.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure that the MMS User Agent uses the MMS connectivity parameter stored on the USIM to connect to the network for MMS purposes.

To ensure that the Terminal's MMS User Agent uses the first stored set of supported parameters in EF_{MMSICP} as default.

To ensure that the Terminal's MMS User Agent uses the MMS user preference information stored on the USIM for user assistance in preparation of terminal-originated MMS
Initial configuration
The USIM has to support the EF_MMSICP and the terminal's MMS User Agent shall use the MMS connectivity parameters stored first in the supported parameter sets of EF_MMSICP as default parameters.

Test Procedure
Generate an MM using the MMS User Agent on the Terminal with the default MMS connectivity settings provided by the card issuer and the MMS user preference information stored in the card and send it.

Expected behaviour
The Terminal shall have read the set of supported MMS connectivity parameters stored first in EF_MMSICP, sent the MM using the MMS connectivity parameters stored first in the supported parameter sets in EF_MMSICP and sent the MM using the MMS user preference information stored in EF_MMSUP.

57.3.8.3 MMS User Preferences usage
Description
Procedure to check if the MMS User Agent uses the MMS related information stored in the USIM. In particular, the MMS connectivity parameters determined by the user, with the first supported set being the default, shall be used.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure the Terminal's MMS User Agent uses the MMS connectivity parameter stored on the USIM to connect to the network for MMS purposes.

To ensure that when using the MMS User Connectivity Parameters the Terminal's MMS User Agent uses the set of supported parameters in EF_MMSUCP with the highest priority (as defined by its position in EF_MMSUCP).

To ensure that the Terminal's MMS User Agent uses the MMS user preference information stored on the USIM for user assistance in preparation of terminal-originated MMS.

Initial configuration
The USIM has to support the EF_MMSUCP and the terminal's MMS User Agent shall use the MMS User Connectivity Parameters with the highest priority as defined by its position in this file, unless otherwise specified by the user.

Test Procedure
Generate an MM using the MMS User Agent on the Terminal with the default MMS User Connectivity Parameters and the MMS user preference information stored in the card and send it.

Expected behaviour
The Terminal shall have read the first supported set of MMS connectivity parameters stored in EF_MMSUCP, sent the MM using the MMS User Connectivity Parameter set with the highest priority (as defined by its position in EF_MMSUCP) and sent the MM using the MMS user preference information stored in EF_MMSUCP.

57.3.8.4 Priority order of MMS Issuer User Connectivity Parameters over the MMS User Connectivity Parameters
Description
Procedure to check if the MMS User Agent uses the MMS related information stored in the USIM

Related core specifications
3GPP TS 31.102
Reason for test
To ensure the Terminal's MMS User Agent uses the MMS connectivity parameter stored on the USIM to connect to the network for MMS purposes.
To ensure that a MMS Issuer Connectivity Parameter set with lower priority (as defined by its position in EF_{MMSICP}) takes precedence over a MMS User Connectivity Parameter set with a higher priority.

Initial configuration
The USIM has to support the EF_{MMSICP}; MMS connectivity parameters are pre-set by the issuer of the USIM with the first set being the default. Such default pre-set MMS connectivity parameter set shall be selected unless otherwise specified by the user.

Test Procedure
Generate an MM using the MMS User Agent on the Terminal with the default MMS User Connectivity Parameters and the MMS user preference information stored in the card and send it.

Expected behaviour
The Terminal shall have sent the MM using the first supported MMS connectivity parameter set which is stored in EF_{MMSICP}.

57.3.9 Support of Mailbox Dialling Numbers and Mailbox Identifier

Description
Procedure for testing support of MBDN and MBI file.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure a DUT manages mailbox dialling numbers and indicators on the USIM.

Initial configuration
The USIM has to support the following elementary files:

- EF_{MBDN} (Mailbox Dialling Numbers) with 4 registers
- EF_{EXT6} (Extension 6)
- EF_{MIB} (Mailbox Identifier) with 4 registers

Service #47 has to be activated in USIM.

Test procedure
Call to MBDN mailbox numbers.

Expected behaviour
DUT shows MBDN numbers to the user.
Call to mailbox numbers selected are done.

57.3.10 Support of Message Waiting Indicator Status

Description
Procedure for testing support of MWIS file.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure a DUT manages message waiting indicator status on the USIM.
Initial configuration
The USIM has to support $E_{MWIS}$ file.
Service #48 has to be activated in USIM.

Test procedure
Different messages indicators are sent to the UE.

Expected behaviour
DUT updates the right values on the USIM card file and the information is displayed to the user.

57.3.11 Support of Call Forwarding Indication Status

Description
Procedure for testing support of CFIS file.

Related core specifications
3GPP TS 31.102

Reason for test
To ensure a DUT manages properly call forwarding status on the USIM.

Initial configuration
The USIM has to support $E_{CFIS}$ and $E_{EXT7}$ files.

Test procedure
Request several call forwarding from the MS.

Expected behaviour
DUT executes the call forwarding, updates properly the files and displays the corresponding indication status.

57.3.12 UICC Logical Channels Management

Description
UICC is a multi-application platform. This means that if several applications are installed on board, they can be executed in parallel using different channels.

Related core specifications
ETSI TS 102 221, 3GPP TS 31.101

Reason for test
To ensure that several applications installed in UICC can be executed simultaneously through different channels.

Initial configuration
Case 1:
- Several applications (such as USIM, ISIM and WIM) that can be executed simultaneously are installed in a UICC.
- WIM and ISIM are executed in a channel different from zero (for example channel 1 and channel 2). USIM is executed in channel 0, as defined by the standard.

Case 2:
- The UICC includes 3 applications that are accessible by 3 MIDlets installed on the handset using JSR177 (SATSA-APDU) API.
- Each MIDlet will connect via a different channel to one of the cardlets (by the channel 1, 2 and 3).
Test procedure
Execute the applications or MIDlets installed in the UICC and maintain all of them running at the same
time.

Expected behaviour
The applications are executed and the device manages the corresponding channels in the right way
(card applications maintain independent status).

57.3.13 Security Mode (Integrity and Ciphering)

57.3.13.1 End of Cipher and Integrity Key Lifetime
Description
A mobile is forced to perform authentication with the network due to expiration of CK and IK.

Related 3GPP/ETSI core specifications
3GPP TS 31.102, 3GPP TS 33.102, 3GPP TS25.301

Reason for test
To ensure that a DUT performs authentication when the content of CK and IK are set as invalid
(content of EFSTART_HFN equal to the content of EFTHRESHOLD).

Initial configuration
The value of Hyperframe number for both CS and PS RRC Connections has to be set near enough to
the relevant THRESHOLD value, so that at the release of the RRC connection itself the value of the
Hyperframe number will be greater than or equal to THRESHOLD. This value will depend on the
network settings.

The communication between the handset and the UICC has to be traced with an APDU monitor.

To perform this test case the DUT has to support a trace mode to log the layer 3 signalling.

Test procedure for CS
1. The DUT is switched on and the PIN is entered on request.
2. A mobile originated speech call to any destination is established. The call is accepted by the
called party. The call is released afterwards: the RRC connection is then released as well.
3. A mobile terminated speech call is established. The call is accepted by the called party. The call
is released afterwards: the RRC connection is then released as well.

Expected behaviour
The signalling is checked in the log file. The UMTS authentication challenge is performed successfully:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Authentication Request (Ciphering key sequence number, RAND, AUTN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Authentication Response(RES)</td>
<td></td>
</tr>
</tbody>
</table>

Ciphering is activated:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Security Mode Command(Ciphering Algorithm=UEA1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security Mode Complete</td>
<td></td>
</tr>
</tbody>
</table>

There should be just one Authentication Request even if there were a MOC or MT call one after
another.

Test procedure for PS
1. The DUT is switched on and the PIN is entered on request.
2. A mobile originated data connection is established. The PDP context is released afterwards: the RRC connection is then released as well.

**Expected behaviour**

The signalling is checked in the log file. The UMTS authentication challenge is performed successfully:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Authentication Request (Ciphering key sequence number, RAND, AUTN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Authentication Response(RES)</td>
<td></td>
</tr>
</tbody>
</table>

Ciphering is activated:

<table>
<thead>
<tr>
<th>Direction DUT - NW</th>
<th>Message</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Security Mode Command(Ciphering Algorithm=UEA1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security Mode Complete</td>
<td></td>
</tr>
</tbody>
</table>

### 57.3.14 USIM Interoperability

#### 57.3.14.1 Memory Full Conditions (Phone Book)

**Description**

Procedure to check phone stability and support of phone book when the phone book on the smartcard is full.

**Related 3GPP core specifications**

3GPP TS 31.102 chapter 4.4.2.3

**Reason for test**

To ensure that the DUT supports all ADN records of the USIM’s phone book while all ADN records are full.

**Initial configuration**

The USIM has to support the following elementary files:
- EF<sub>ADN</sub> (Abbreviated dialling numbers)
- EF<sub>GRP</sub> (Grouping file)
- EF<sub>GAS</sub> (Grouping information Alpha String)
- EF<sub>PBR</sub> (Phone Book Reference file)

To perform this test case the USIM shall contain 250 ADN records. An external card reader/writer for USIMs is required.

A one telephone subscription with the telephone number <MSISDN> is required to send and receive calls.

With the external card reader all ADN record shall be written with the following content:

<table>
<thead>
<tr>
<th>ADN No</th>
<th>Alpha Identifier</th>
<th>BCD Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alpha1</td>
<td>01234567891</td>
</tr>
<tr>
<td>2</td>
<td>Alpha2</td>
<td>01234567892</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;ADN No&gt;</td>
<td>Alpha&lt;ADN No&gt;</td>
<td>0123456789&lt;ADN No&gt;</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>248</td>
<td>Alpha248</td>
<td>0123456789248</td>
</tr>
<tr>
<td>249</td>
<td>NotInLastGroup</td>
<td>0123456789249</td>
</tr>
<tr>
<td>250</td>
<td>PleaseDialThisNo</td>
<td>&lt;MSISDN&gt;</td>
</tr>
</tbody>
</table>
Check the number of EF\textsubscript{GAS} records (<EF-GAS-Rec>). With the external card reader the following
EF\textsubscript{GAS} records are created:

<table>
<thead>
<tr>
<th>GAS Record</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group No 1</td>
</tr>
<tr>
<td>2</td>
<td>Group No 2</td>
</tr>
<tr>
<td>...</td>
<td>Group No &lt;GAS No&gt;</td>
</tr>
<tr>
<td>&lt;GAS-Rec&gt;</td>
<td>Last Group</td>
</tr>
</tbody>
</table>

With the external card reader the following EF\textsubscript{GRP} records are set:

<table>
<thead>
<tr>
<th>GRP Record</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;GAS-Rec&gt;</td>
</tr>
<tr>
<td>2</td>
<td>&lt;GAS-Rec&gt;</td>
</tr>
<tr>
<td>...</td>
<td>&lt;GAS-Rec&gt;</td>
</tr>
<tr>
<td>248</td>
<td>&lt;GAS-Rec&gt;</td>
</tr>
<tr>
<td>249</td>
<td>1</td>
</tr>
<tr>
<td>250</td>
<td>&lt;GAS-Rec&gt;</td>
</tr>
</tbody>
</table>

Check the number of EF\textsubscript{eMail} records (<eMail-Rec>). With the external card reader the following
EF\textsubscript{eMail} records are defined:

<table>
<thead>
<tr>
<th>eMail Record</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><a href="mailto:Dummy1@address.org">Dummy1@address.org</a></td>
</tr>
<tr>
<td>2</td>
<td><a href="mailto:Dummy2@address.org">Dummy2@address.org</a></td>
</tr>
<tr>
<td>...</td>
<td>Dummy&lt;GAS No&gt;@address.org</td>
</tr>
<tr>
<td>&lt;eMail-Rec&gt;</td>
<td>Dummy&lt;EF-GAS-Rec - 1&gt;@address.org</td>
</tr>
<tr>
<td>&lt;eMail-Rec&gt;</td>
<td>&lt;any valid eMail address&gt;</td>
</tr>
</tbody>
</table>

With the external card reader the EF\textsubscript{IAP} record is defined:

- For all records $Y=[1 \ldots (250-<eMail-Rec>), EF\textsubscript{IAP} (Y) = FF \ldots FF$
  (The first 250-<eMail-Rec> ADNs are not assigned to an eMail address.)
- For all records $Y= [251-<eMail-Rec> \ldots <eMail-Rec>-1], EF\textsubscript{IAP} (Y) = <X \text{ bytes, see table}>
  (ADN # 251-<eMail-Rec> to 249 are assigned to the first (<eMail-Rec>-1) eMail records)
The USIM is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

**Test procedure**

1. Check for all the following procedures that the device is stable and no reset is performed.
2. Select the phone book entry “PleaseDialThisNo” and perform a call to this destination.
3. If available select the menu function which filters for individual groups. Use this function and filter for group “Last Group”.
4. Search for the phone book entry “NotInLastGroup”.
5. Select the phone book entry “PleaseDialThisNo” and perform a call to this destination.
6. Create a new eMail and send it to the eMail address associated to the ADN “PleaseDialThisNo”. Check that the eMail is received.

**Expected behaviour**

1. The device is stable and no reset is performed.
2. The phone book entry could be selected correctly. A mobile originated call could be established to the number <MSISDN>.
3. If the filter function is available the group “Last Group” could be filtered.
4. The phone book entry “NotInLastGroup” could not be found in the filtered “Last Group” entries.
5. The phone book entry could be selected correctly. A mobile originated call could be established to the number <MSISDN>.
6. The eMail is received.

- EF_MSISDN (Record #2) and EF_MSISDN (Record #3) shall be unchanged.
57.3.14.2 SDN saved on USIM

Description
Procedure for testing support of SDN entries.

Related 3GPP core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports the elementary file EF_{SDN} (SDN) in the USIM.

Initial configuration
The USIM have to support the following elementary file:

- EF_{SDN} (SDN)

Service #4 shall be activated in the USIM.

To perform this test case an external card reader/writer for USIMs is required. With this external card reader the following records are stored in the USIM:

- EF_{SDN} (Record #1)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>466972374204E756D626572FF ... FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>07</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>91</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>942143658709FFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

- EF_{SDN} (Record #2)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>5365636F6E64204E756D626572FF ... FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>08</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>81</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>103254769810F2FFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

- EF_{SDN} (Record #3)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>Value</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – X</td>
<td>5468697264204E6FFF ... FF</td>
<td>X bytes</td>
</tr>
<tr>
<td>X+1</td>
<td>08</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+2</td>
<td>91</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+3 to X+12</td>
<td>44214365870921FFFFFF</td>
<td>10 bytes</td>
</tr>
<tr>
<td>X+13</td>
<td>FF</td>
<td>1 byte</td>
</tr>
<tr>
<td>X+14</td>
<td>FF</td>
<td>1 byte</td>
</tr>
</tbody>
</table>

The USIM is placed in the device.

Test procedure
1. The DUT is switched on and the menu function is selected where the UE's service numbers can be displayed.
2. The entry “First Number” is selected and changed to:

<table>
<thead>
<tr>
<th>Alpha Identifier</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changed Entry</td>
<td>+12345678901234</td>
</tr>
</tbody>
</table>
3. The USIM is removed from the DUT and checked in an external card reader:

**Expected behaviour**

1. The DUT presents a list of possible numbers and present the alpha identifiers for at least the following entries in SDN.

<table>
<thead>
<tr>
<th>Alpha Identifier</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Number</td>
<td>+491234567890</td>
</tr>
<tr>
<td>Second Number</td>
<td>0123456789012</td>
</tr>
<tr>
<td>Third No</td>
<td>+44123456789012</td>
</tr>
</tbody>
</table>

2. The DUT accepts the changes.

3. The entries of EF\textsubscript{SDN} shall be

   - EF\textsubscript{SDN} (Record #1)
     
     | Bytes | Value                          | Length |
     |-------|--------------------------------|--------|
     | 1 – X | 4368616E67655420456E747279FF ... FF | X bytes |
     | X+1   | 08                             | 1 byte |
     | X+2   | 91                             | 1 byte |
     | X+3 to X+12 | 21436587092143FFFFFF          | 10 bytes |
     | X+13  | FF                             | 1 byte |
     | X+14  | FF                             | 1 byte |

   - EF\textsubscript{SDN} (Record #2) and EF\textsubscript{SDN} (Record #3) shall be unchanged.

### 57.3.14.3 3G terminals with UICC with 2 or more USIM inside

**Description**

Procedure for testing support of more than one USIM inside a UICC.

**Related 3GPP/ETSI core specifications**

ETSI TS 102 221, 3GPP TS 31.101, TS 31.102, TS 131.110

**Reason for test**

To ensure that the DUT can manage (selection, initialization, termination, reset) an specific application among several existing in the UICC.

**Initial configuration**

The UICC has to include in the EF\textsubscript{DIR} file at least 3 different USIM applications named USIM1, USIM2 and USIM3.

**Test procedure**

1. The DUT explores the UICC and shows all USIM labels available for user selection.
2. User selects USIM2 for activation.
3. User selects USIM3 for activation.

**Expected behaviour**

1. The handset shows applications recognized inside EF\textsubscript{DIR} to the user.
2. After user selection, the USIM2 is initialised and ready for network access.
3. After USIM3 selection, USIM2 is terminated and USIM3 is established as the application for network accessing the 3G network.
57.3.14.4 3G terminals with UICC within 2 or more network access applications (SIM/USIM/R-UIM/ISIM)

Description
Procedure for assuring that UICC with several network access applications (some of them not related to GSM or UMTS) works properly on 3G devices.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that a DUT works properly with UICC including several applications inside.

Initial configuration
UICC with several network access applications inside (for example SIM/USIM,RUIM/ISIM).

Test procedure
1. Insert UICC in the device.
2. Access to USIM phonebook, select one entry and make a phone call and send a SMS with it.
3. Receive a call and a SMS.

Expected behaviour
1. The DUT uses the USIM for accessing 3G network.
2. The call is done and message is sent.
3. The call and SMS is received.

57.3.14.5 Support of more than one phonebook

Description
Procedure for testing support of multiple phonebook.

Related 3GPP core specifications
3GPP TS 31.102

Reason for test
To ensure that a DUT supports multiple phonebook in the UICC with USIM.

Initial configuration
The UICC may contain application specific phonebooks. When both phonebook types co-exist, they are independent and no data is shared. In this case, it shall be possible for the user to select which phonebook the user would like to access.

The USIM has to support the following elementary files:
- EFADN (Abbreviated dialling numbers) 5F3A; 5F3B; 5F3C.
- EFPBR (Phone Book Reference file)

To perform this test case the USIM shall contain 3 ADN records in each phonebook. An external card reader/writer for USIMs is required.

One telephone subscription with the telephone number <MSISDN> is required to send and receive calls.

With the external card reader all ADN record shall be written with the following content:
The USIM is placed in the device and this DUT is switched on either in GSM or UTRAN environment with sufficient coverage.

**Test procedure**
1. Check for all the following procedures that the device is stable and no reset is performed.
2. Select the phone book number 1
3. Find and select entry "PleaseDialThisNo" and perform a call to this destination.
4. Select the phone book number 2
5. Find and select entry "PleaseDialThisNo" and perform a call to this destination.
6. Select the phone book number 3
7. Find and select entry "PleaseDialThisNo" and perform a call to this destination.

**Expected behaviour**
1. The device is stable and no reset is performed.
2. The different phonebooks could be found and selected correctly.
3. The phone book entry could be selected correctly. A mobile originated call could be established to the number <MSISDN>.

**57.3.15 USIM Application Toolkit (USAT)**

**57.3.15.1 General USAT Function**

**NOTE:** Each operator’s specific application shall be run

**Description**
Procedure for testing all USAT Applications on the USIM.

**Related 3GPP core specifications**
3GPP TS 31.111

**Reason for test**
To ensure that a DUT supports USIM Application Toolkit.

**Initial configuration**
A selection of USIMs with different USAT Applications from all major smartcard vendors is required for this test. Documentation on the functionality of the USAT Application and presentation on the UE’s display is required by the Service Provider of the USIM.

**Test procedure**
1. Select the USAT menu
2. Perform each USAT application presented in the USAT menu
Expected behaviour
1. The USAT main menu is presented as documented by the service provider.
2. The USAT applications are performed as documented by the service provider.

57.3.15.2 PLAY TONE
Description
Ensure that the PLAY TONE command is correctly processed by the MS.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that the PLAY TONE command is correctly processed by the MS.

Initial configuration
DUT in idle mode. USIM inserted with an application that makes use of the PLAY TONE command.

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a PLAY TONE command, ‘short message’ sound type with null alpha text.
2. Arrange for an event to occur which will cause the USIM to send a PLAY TONE command, ‘short message’ sound type with an alpha text.

Expected behaviour
1. The DUT shall play the corresponding tone.
2. The DUT shall play the corresponding tone and the correct text shall be displayed on the DUT display.

57.3.15.3 REFRESH
Description
Ensure that refresh requested by the USIM is correctly processed by the MS.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that REFRESH command is correctly processed by the MS.

Initial configuration
DUT in idle mode. USIM inserted with an application that makes use of REFRESH command:
- USIM application reset
- 3G session reset

Test procedure
1. Arrange for an event to occur which will cause the SIM to send a REFRESH (USIM application reset) command.
2. Arrange for an event to occur which will cause the SIM to send a REFRESH (3G session reset) command.

Expected behaviour
The DUT shall refresh its memory regarding procedure notified.
57.3.15.4 PROVIDE LOCAL INFORMATION

Description
Ensure that current local information requested by the USIM is correctly processed by the MS.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that PROVIDE LOCAL INFORMATION command is correctly processed by the MS.

Initial configuration
DUT in idle mode. USIM inserted with an application that makes use of PROVIDE LOCAL INFORMATION (Current Access Technology) command.

Test procedure
Arrange for an event to occur which will cause the USIM to send an PROVIDE LOCAL INFORMATION (Current Access Technology) command.

Expected behaviour
The DUT shall pass to the USIM the data demanded by the PROVIDE LOCAL INFORMATION command.

57.3.15.5 SIM Events

57.3.15.5.1 Access Technology Change Event

Description
Ensure that the Access Status Technology Change event is sent to the USIM.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that the Access Technology Change Event is sent to the USIM.

Initial configuration
DUT in idle mode. USIM inserted with an application that makes use of the Access Technology Change event.

Test procedure
1. Force the handset to change the technology (from 2G to 3G) of the serving network, and check that the USIM application is triggered.
2. Force the handset to change the technology (from 3G to 2G) of the serving network, and check that the USIM application is triggered.

Expected behaviour
The USIM application triggered by the Access Technology Change event is started when a new technology is accessed.

57.3.15.5.2 Local Connection Event

Description
Ensure that the Local Connection event is sent to the USIM.

Related 3GPP core specifications
3GPP TS 31.111
Reason for test
To ensure that the Local Connection Event is sent to the USIM.

Initial configuration
USIM inserted with an application that makes use of the Local Connection event. DUT with a transparent local link channel open between the USIM and another device (i.e. PC).

Test procedure
Start the USAT application that makes usage of a local connection.

Expected behaviour
The USIM application triggered by the Local Connection event is started when connection is established.

57.3.15.6 Bearer Independent Protocol

Note: In order to perform these tests, the terminal device needs to support letter class ‘e’.

57.3.15.6.1 Default Network Bearer

Description
USAT applications will exchange data using default network bearer if requested to the handset.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that exchange of data is possible through default network bearer.

Initial configuration
USIM inserted with an application that uses default network bearer. Connection between USIM and another device shall be established.

Test procedure
Start the USAT application that uses default network bearer.

Expected behaviour
The USAT application shall be able to exchange data over the default network bearer.

57.3.15.6.2 Local Link Bearer

Description
USAT applications will be able to exchange data through local link bearer if letter class ‘f’ is implemented in the terminal device.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that exchange of data is possible through local link bearer.

Initial configuration
USIM inserted with an application that makes usage of the Local Link Bearer (e.g. Bluetooth). Connection between USIM and another device (e.g. PC) shall be established.

Test procedure
Start the USAT application that uses a Local Link Bearer.

Expected behaviour
The USAT application shall be able to exchange data over the Local Link Bearer.
57.3.15.6.3 Service Search

Description
The UICC needs to detect if services are available before establish a local data connection if letter class ‘f’ is implemented in the terminal device.

Related 3GPP/ETSI core specifications
3GPP TS 31.111

Reason for test
To ensure that the UICC is able to search for service in the environment terminal.

Initial configuration
USIM inserted with an application that uses any bearer available (e.g. Bluetooth). Connection between USIM and another device (e.g. PC) shall be established. A service shall be available in the other device.

Test procedure
Start the USAT application that asks for search a service. The ME searches for the service.

Expected behaviour
The USAT application shall be informed that the service is available.

57.3.15.6.4 Get Service Information

Description
Ensure that the UICC is able to retrieve all needed information regarding a service that is already detected as available in the environment terminal if letter class ‘f’ is implemented in the terminal device.

Related 3GPP core specifications
3GPP TS 31.111

Reason for test
To ensure that the UICC retrieves all relevant information regarding a service available in the environment terminal.

Initial configuration
USIM inserted with an application that uses a local bearer available (e.g. Bluetooth connection). Connection with the other device (e.g. PC) shall be established. A service shall be available in the other device.

Test procedure
USAT application shall display a message (through a display text command), specifying that the service was detected. Upon validation of the user, USAT application shall send the command (Get Service Information) and retrieve all the information.

Expected behaviour
The USAT application shall be able to display the service information retrieved and connect to the service after.

57.3.15.6.5 Declare Service

Description
UICC will be able to declare a service to the terminal in order to prepare a local data connection if letter class ‘f’ is implemented in the terminal device.

Related 3GPP core specifications
3GPP TS 31.111
Reason for test
To ensure that UICC is able to declare a service.

Initial configuration
USIM inserted with an application that uses bearer available (e.g. Bluetooth).

Test procedure
USAT Application shall declare a service at start-up.

Expected behaviour
The service shall be visible on the terminal.

57.3.15.7 Multimedia Content Management

57.3.15.8 USSD Data Download

Description
Some services that requires SIM card resources can uses USSD data as a low cost bearer for Network-USIM communication. In some cases this communication needs to be transparent for the user (for example in case of SIM application data management).

Related 3GPP/ETSI core specifications
3GPP TS 31.111

Reason for test
To ensure that handset is able to receive an USSD Data Download (USSD_DD) command from the network and deliver it transparently to the USIM.

Initial configuration
- UICC within an application on board that allows USSD DD management (app1).
- USSD server or simulator for delivering USSD_DD messages.

Test procedure
From an USSD server, send an USSD Data Download command to the terminal including some data for the app1 installed in the UICC (data is formatted according to 23.048 specifications).

Case 1: Deliver a STK command. A “DisplayText” command with this text: “APP STK launched after USSD_DD”

Case 2: Deliver a file management command. An “Update File” command of the ADN (register 1). (Name: “Updated USSD”, Phone number: “123”).

Case 3: Deliver data to an application. A text sent to the app1: “Text for USSD_DD testing”

Case 4: Deliver an application management command. A command for blocking app1.

    Note: Before repeat all test cases, the app1 needs to be unblocked (it can be done using a card reader, OTA SMS or another USSD_DD).

Expected behaviour
The terminal receives the USSD_DD command and delivers it to the USIM.

Case 1: After processing the command, the device shall display on the screen the text “APP STK launched after USSD_DD”.

Case 2: The ADN is updated with the name and phone number that were sent via USSD_DD. When accessing to the phone book, a new entry appears.

Case 3: The text “Text for USSD_DD testing” is delivered to the app1 installed in the USIM and this app1 generates the STK command that presents the text on the screen,

Case 4: The command is delivered to the UICC and the app1 blocked.
57.3.16 ISIM Application

Description
Procedure for testing support of ISIM application (service provisioning and network authentication) for IMS accessing.

Related 3GPP/ETSI core specifications
TS 31.103

Reason for test
To ensure that the DUT uses ISIM application for IMS accessing.

Initial configuration
The UICC with ISIM has to support the following elementary files:
- EFKeys (Ciphering and Integrity Keys for IMS)
- EFIMPI (IMS private user identity)
- EFDOMAIN (Home Network Domain Name)
- EFIMPU (IMS public user identity)
- EFAD (Administrative Data)

Test procedure
1. The user runs an IMS application from the device.
2. The user closes active IMS application.
3. The handset initialises the ISIM application for accessing IMS network and services.
4. The handset reads the ISIM files.
5. The handset executes the authentication procedure and updates the file EFKeys.
6. After finishing IMS service, the handset terminates the ISIM session and closes the ISIM application.

57.3.17 Client Provisioning (CP)

57.3.17.1 SIM based CP

Description
Procedure for testing support of CP capabilities on SIM.

Related 3GPP/ETSI core specifications
OMA CP 1.1-Smart Card Provisioning

Reason for test
To ensure that the DUT retrieves services provisioning parameters from the SIM card and uses them properly.

Initial configuration
SIM1 inserted with EFConfig1 configured for services access.
SIM2 inserted with EFConfig2 configured for services access.
SIM3 inserted with EFBootstrap configured for services access.

Test procedure
1. Insert the SIM and check through DUT menus the provisioning parameters.
2. Access different services configured.
3. Check if is possible modify the values on the card according to the access conditions of each file.

**Expected behaviour**
1. DUT shows properly the values stored on the SIM files.
2. DUT uses properly the values retrieved from the SIM.
3. Bootstrap cannot be modified by the user.
4. Config1 can be updated by the user if PIN code is typed.
5. Config2 can be modified by the user.

### 57.3.17.2 UICC based CP

**Description**
Procedure for testing support of CP capabilities on UICC.

**Related 3GPP/ETSI core specifications**
OMA CP 1.1-Smart Card Provisioning

**Reason for test**
To ensure that the DUT retrieves provisioning parameters from the UICC application and uses them properly.

**Initial configuration**
UICC inserted with CP files (EF\textsubscript{Config1}, EF\textsubscript{Config2} and EF\textsubscript{Bootstrap}) configured for services access.

**Test procedure**
1. Insert the UICC and check through DUT menus the services provisioning parameters.
2. Access different services configured.
3. Check if is possible modify the values on the card according to the access conditions of each file.

**Expected behaviour**
1. DUT shows properly the values stored on the UICC files.
2. DUT uses properly the values retrieved from the UICC.
3. Bootstrap cannot be modified by the user.
4. Config1 can be updated by the user if PIN code is typed.
5. Config2 can be modified by the user.

### 57.3.18 Bluetooth SIM Access Profile (SAP)

**Description**
Procedure for testing support of Bluetooth SIM Access Profile (SAP): a SIM Access Client accesses a UICC on the handset through a SIM Access Server.

**Related 3GPP/ETSI/Bluetooth core specifications**
ETSI SCP TS 102 221
SIM Access Profile - Interoperability Specification

**Reason for test**
To check that a SIM Access Client is able to communicate with a UICC in the DUT when the latter hosts a SIM Access Server.

**Initial configuration**
A UICC is inserted into the DUT and is powered on.
The peripheral hosting the SIM Access Client initiates the Bluetooth connection to the DUT hosting the SIM Access Server and performs bonding. The security mode is set to 2. The link between Client and Server is encrypted using Bluetooth baseband encryption.

Test procedure
1. SIM Access Client and Server execute a SAP Connect procedure. The SAP messages to be exchanged are as follow:
   a. CONNECT_REQ
   b. CONNECT_RESP (ConnectionStatus = OK, Server can fulfil requirements)
   c. STATUS_IND (StatusChange = Card_reset)
   d. TRANSFER_ATR_REQ
   e. TRANSFER_ATR_RESP
2. The SIM Access Client and Server perform the SAP "Transfer APDU" procedure as follows:
   f. TRANSFER_APDU_REQ (CommandAPDU7816 = Select MF)
   g. TRANSFER_APDU_RESP (ResultCode = OK, request processed correctly; ResponseAPDU = R-APDU coded in accordance to ETSI SCP TS 102 221)

Expected behaviour
The SIM Access Client retrieves the Get Response data following the Select MF performed on the UICC hosted in the UE.

57.3.19 EAP-AKA

Description
EAP is an authentication framework, which supports multiple authentication methods. It was designed for use in network access authentication, where IP layer connectivity may not be available. EAP is used to select a specific authentication mechanism, typically after the access point requests more information in order to determine the specific authentication method to be used. EAP-AKA is the mechanism for 3G authentication and session key distribution. It allows the end-user to access to the Internet with its 3G equipment (Terminal and UICC). The EAP-AKA supplicant, which is providing to the access point the credential information for authentication for the access point is composed of 2 parts, distributed in the UICC and the Terminal. The interface between the UICC and the Terminal is described in ETSI TS 102 310. This test will insure that the operation of authentication handled by the UICC and Terminal is successfully implemented.

Related 3GPP/ETSI core specifications
ETSI TS 102 310

Reason for test
To insure that the supplicant (authentication client) in the UICC-Terminal is able to authenticate with the Radius (authentication server), through an Access Point compliant with WLAN 802.1x (authenticator).

Initial configuration

Test procedure
The Terminal detects the access point and the procedure for the authentication is proceeded, until the terminal gets the rights to access the network.

Expected behaviour
The Terminal is allowed to access the network.
Annex E: Detailed Test Procedures for Additional Terminal Performance Aspects

This Annex contains the detailed procedures that are recommended to be used for Additional Terminal Performance Aspects.

Note: For a Dual RAT Terminal Device, all RAT independent Test Scenarios shall be executed at an UMTS network, and a subset of Test Scenarios shall be executed in a 2G/2.5G network as a regression.

60 Operation in areas of poor signal

Description
Check operation of MS in areas of poor signal strength and quality

Related GSM core specifications
None.

Reason for test
To ensure that the MS continues to operate in areas of low signal strength and/or poor signal quality, and that the performance of the integral antenna is adequate.

Initial configuration
MS

Test procedure
The MS shall be taken into areas of poor signal, and a series of checks made for the following

1. Failed call attempts
2. Dropped voice calls
3. Intelligibility of speech
4. Dropped data calls
5. Data rates for data calls

Where possible, the co-operation of the operator should be obtained in order to determine suitable areas of low signal strength. Predefined drive-round routes may already be available for the purpose.

It is advisable to carry out tests both with a new MS and an MS already in use that is known to have good performance in this respect. This will make it possible to compare the results and estimate the relative performance of the new MS in adverse radio conditions.

Expected behaviour
Operation is adequate in areas of poor signal quality.

61 Speech quality

Note: In the context of the tests of this section, “Acceptable quality” is a subjective term, and will vary according to the codec used and the call conditions (e.g. background noise such as driving in a car or a busy office, and radio conditions). It should include the fact that no speech dropouts are occurring, that RF bursting is not disturbing the speech path, that comfort noise is being correctly produced on the DL path during downlink DTX and Random Frequency Hopping. All tests should be performed when maximum MS output power is used.
61.1 Full Rate

61.1.1 FR Speech quality handset operation

61.1.1.1 FR Downlink handset speech quality

Description
Speech from the distant party shall be of acceptable quality in a variety of acoustic conditions.

Related GSM core specifications
TS 43.050, TS 46.010

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on a full-rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions
   1. Without background noise at distant end
   2. With some background noise at distant end
   3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality, that the distant party cannot hear any significant echo, and that comfort noise is present during periods of silence.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.1.1.2 FR Uplink handset speech quality

Description
Speech from the mobile shall be of acceptable quality.

Related GSM core specifications
TS 43.050, TS 46.010

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on a full-rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions
   1. Without background noise at the mobile
   2. With some background noise at the mobile
   3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.1.2 FR Speech quality handsfree operation

Note: These tests are applicable if the mobile is supplied with a handsfree kit. It does not apply to handsfree kits supplied separately or by third parties.

61.1.2.1 FR Downlink handsfree speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.010

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on a full-rate call in an area of good coverage to a distant party

Test procedure
Carry out checks of downlink speech quality under the following conditions:
1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality. Check that the distant party cannot hear any significant echo.

Check that comfort noise is present during periods of silence.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.1.2.2 FR Uplink handsfree speech quality

Description
Speech from the mobile shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.010

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on a full-rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions:
1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.2 Half Rate

61.2.1 HR Speech quality handset operation

61.2.1.1 HR Downlink handset speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.020

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on a half-rate call in an area of good coverage to a distant party

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality. Check that the distant party cannot hear any significant echo.

Check that comfort noise is present during periods of silence.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.2.1.2 HR Uplink handset speech quality

Description
Speech from the mobile shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.020

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on a half-rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.2.2 HR Speech quality handsfree operation

Note: These tests are applicable if the mobile is supplied with a handsfree kit. It does not apply to handsfree kits supplied separately or by third parties

61.2.2.1 HR Downlink handsfree speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.020

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on a half-rate call in an area of good coverage to a distant party

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality. Check that the distant party cannot hear any significant echo.

Check that comfort noise is present during periods of silence.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.2.2.2 HR Uplink handsfree speech quality

Description
Speech from the mobile shall be of acceptable quality.

Related GSM core specifications
TS 43.050, TS 46.020

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on a half-rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.3  Enhanced Full Rate

61.3.1  EFR Speech quality handset operation

61.3.1.1  EFR Downlink handset speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on an enhanced full rate call in an area of good coverage to a distant party

Test procedure
Carry out checks of downlink speech quality under the following conditions

1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality, Check that the distant party cannot hear any significant echo.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.3.1.2  EFR Uplink handset speech quality without background noise

Description
Speech from the mobile shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on an enhanced full rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions

1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.3.2 EFR Speech quality handsfree operation

Note: These tests are applicable if the mobile is supplied with a handsfree kit. It does not apply to handsfree kits supplied separately or by third parties.

61.3.2.1 EFR Downlink handsfree speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on an enhanced full rate call in an area of good coverage to a distant party

Test procedure
Carry out checks of downlink speech quality under the following conditions

1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality, Check that the distant party cannot hear any significant echo.

Check that comfort noise is present during periods of silence.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.3.2.2 EFR Uplink handsfree speech quality

Description
Speech from the mobile shall be of acceptable quality.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS using handsfree kit on an enhanced full rate call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions

1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.4 Adaptive Multi Rate

61.4.1 AMR Speech quality handset operation

61.4.1.1 AMR Downlink handset speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on an AMR call in an area of good coverage to a distant party speaking without background noise

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end

In each case, check that the speech is of acceptable quality, Check that the distant party cannot hear any significant echo.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.4.1.2 AMR Uplink handset speech quality without background noise

Description
Speech from the mobile shall be of acceptable quality.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS

Initial configuration
MS on an AMR call in an area of good coverage

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile

In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.4.2 AMR Speech quality handsfree operation

Note: These tests are applicable if the mobile is supplied with a handsfree kit. It does not apply to handsfree kits supplied separately or by third parties.

61.4.2.1 AMR Downlink handsfree speech quality

Description
Speech from the distant party shall be of acceptable quality when there is no background noise.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS.

Initial configuration
MS using handsfree kit on an AMR call in an area of good coverage to a distant party speaking without background noise.

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at distant end
2. With some background noise at distant end
3. With loud background noise at distant end
In each case, check that the speech is of acceptable quality, AMR Uplink handsfree speech quality.

Expected behaviour
The speech is of acceptable quality, the distant party cannot hear any significant echo, and comfort noise is present during periods of silence.

61.4.2.1 AMR Uplink handsfree speech quality

Description
Speech from the mobile shall be of acceptable quality.

Related GSM core specifications
TS 43.050, TS 46.060

Reason for test
If speech is not of acceptable quality, then the customer is unable to make effective use of the MS.

Initial configuration
MS using handsfree kit on an AMR call in an area of good coverage without background noise.

Test procedure
Carry out checks of downlink speech quality under the following conditions
1. Without background noise at the mobile
2. With some background noise at the mobile
3. With loud background noise at the mobile
In each case, check that the speech heard by the distant party is of acceptable quality.

Expected behaviour
The speech heard by the distant party is of acceptable quality.
61.5 **Microphone mute**

61.5.1 **Microphone mute**

**Description**
The microphone mute facility shall work effectively

**Related GSM core specifications**
None.

**Reason for test**
To ensure that, when the microphone mute is activated, that the distant party cannot hear any sounds from the mobile user

**Initial configuration**
MS on an active voice call

**Test procedure**
With an active call, perform the command to mute the microphone. Check that the display indicates the microphone is muted and that the distant party can no longer hear anything.

Clear the call and make another call. Check that the microphone is no longer muted.

**Expected behaviour**
The display indicates the microphone is muted and the distant party can no longer hear anything. The microphone is no longer muted when another call is made.

62 **General performance monitoring**

62.1 **Call setup performance**

**NOTE:** It is advisable to carry out tests both with the new MS and an MS already in use that is known to have good performance in this respect. This will make it possible to compare the results and estimate the relative performance of the new MS.

**Description**
Check the reliability of the MS in setting up calls

**Related GSM core specifications**
None.

**Reason for test**
To ensure that the MS minimises the number of failed call setups

**Initial configuration**
N/A

**Test procedure**
Note should be made of the cause codes and messages of any failed calls caused by the network or the MS.

62.2 **Mobile lockup count**

**Description**
Check the reliability of the MS in general operation

**Related GSM core specifications**
None.
Reason for test
To ensure that the MS minimises the number of lockups

Initial configuration
N/A

Test procedure
Throughout the test, note shall be taken of any occasion where the MS locks up, requiring any kind of reset to restart operation. The information gathered shall include

1. The date and time of the event
2. The procedure being undertaken at the time
3. Any relevant information concerning the current network and MS configuration

The cause of all such lockups shall be investigated as far as possible. A limit shall be defined for the number of such failures.
Annex F: Detailed Test Procedures for Services based on non-3GPP Radio Access Technologies

This Annex contains the detailed procedures that are recommended to be used for tests of services based on non-3GPP Radio Access Technologies.

80 Digital Video Broadcasting for Handheld Terminals (DVB-H)

80.1 DVB-H Out of Coverage

Description
Verify that the DVB-H out-of-coverage algorithm is functioning correctly.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV services whilst mobile the DVB-H function within a terminal must recover from losing and then recovering DVB-H signal.

Initial Configuration
The UE shall be in good DVB-H and cellular (2G or 3G) network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to either a 2G or 3G network.

Test Procedure
Move the UE into an area of patchy DVB-H coverage such that DVB-H coverage is lost and then recovered.

Cellular coverage shall remain good throughout the test, such that cellular coverage is not lost.

Repeat the test 5 times.

Expected Behaviour
Ensure that the out-of-coverage algorithm (i.e. triggers, timers, frequency of scans etc.) behave as per the UE vendors specification.

Verify that the UE’s DVB-H functionality successfully recovers from being out-of-service when the UE returns into the DVB-H coverage area.

80.2 DVB-H Handover

80.2.1 Single Frequency Network Handover

Description
To verify that the UE correctly supports handover within DVB-H cells organized in Single Frequency Network (SFN).

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television
Reason for Test
To ensure user satisfaction for TV services while mobile the DVB-H function within a terminal must support seamless handover between SFN DVB-H cells.

Initial Configuration
Perform this test within a single frequency DVB-H network coverage area.

The UE shall be in good DVB-H and cellular (2G or 3G) network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to either a 2G or 3G network.

Test Procedure
Move the UE back and forth between two DVB-H transmitters organized in SFN.

Repeat the test 5 times.

Expected Behaviour
Verify that there is continuous audio/video service when moving between the two DVB-H transmitters.

80.2.2 Multi-Frequency Network Handover
Description
To verify that the UE correctly supports handover within DVB-H cells organized in Multi Frequency Network (MFN).

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV services while mobile the DVB-H function within a terminal must support seamless handover between MFN DVB-H cells.

Initial Configuration
Perform this test within a multi-frequency DVB-H network coverage area. (Cell1 operating on Frequency1 and Cell2 operating on Frequency2)

Ensure that both frequencies transmit the same TV channels

The UE shall be in good DVB-H and cellular (2G or 3G) network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to either a 2G or 3G network.

Test Procedure
Move the UE back and forth between Cell1 and Cell2 to stimulate inter-frequency DVB-H handovers.

Repeat the test 5 times.

Expected Behaviour
Verify that the UE performs seamless handover when handing over between Cell1 and Cell2 and vice versa.

Verify that there is continuous audio/video service when handing over from Cell1 to Cell2 and vice versa.

If the UE supports smart frequency scanning, and if appropriate test tools available to the tester, verify using a logging tool that the UE prioritises frequency scans on Cell1’s neighbouring cells over other cells when it is receiving DVB-H service from Cell1. Likewise, verify using a logging tool that the UE
prioritises frequency scans on Cell2’s neighbouring cells over other cells when it is receiving DVB-H service from Cell2.

Note: This smart way to perform a frequency-scan is described in ETSI but it is not mandatory. This requirement has been created to verify this function should it be implemented by the terminal vendor).

80.3 DVB-H Channel Switching

Description
To verify the time needed to switch between DVB-H channels.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV services the user must be able to change between TV channels quickly.

Initial Configuration
The UE shall be in good DVB-H and cellular (2G or 3G) network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to either a 2G or 3G network.

Test Procedure
Use the DVB-H application on the UE to change channels.
Using a stopwatch (or other timer) measure the time between clicking the ‘change channel’ button and the picture from the new channel appearing on the display of the UE.
Repeat the test 5 times.

Expected Behaviour
The UE shall switch from one service / channel to another one in half time slicing period. The time slice period is the period in which the bursts belonging to all services are repeated.
The time to change channel shall be as per the UE vendor’s specification.

Note: The duration of the time slice period being used to verify that this criteria is being met by the UE must be available to the tester in order to be able to perform the test.

80.4 Features Interaction with DVB-H Active

80.4.1 3G Voice Call Feature Interaction

Description
3G terminated voice call whilst DVB-H application is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the user must be able to successful receive a 3G voice call when the DVB-H application is active.
Initial Configuration
The UE shall be in good DVB-H and 3G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 3G network.

Test Procedure
Call the UE. Answer the call each time and then hang up the call from the UE.
Repeat the test 10 times.

Expected Behaviour
The interaction between the call and the DVB-H functionality shall behave as per the UE vendor’s specification.
Verify that each call can be accepted and then terminated.
Verify that the DVB-H application successfully recovers after each call.

80.4.2 3G Video Call Feature Interaction
Description
3G terminated video call whilst DVB-H application is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the user must be able to successful receive a 3G video call when the DVB-H application is active.

Initial Configuration
The UE shall be in good DVB-H and 3G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 3G network.

Test Procedure
Video call the UE. Answer the call each time and then hang up the call from the UE.
Repeat the test 10 times.

Expected Behaviour
The interaction between the video call and the DVB-H functionality shall behave as per the UE vendor’s specification.
Verify that each call can be accepted and then terminated.
Verify that the DVB-H application successfully recovers after each video call.

80.4.3 3G SMS Feature Interaction
Description
3G terminated and originated SMS whilst DVB-H application is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television
Reason for Test
To ensure user satisfaction for TV and cellular services the user must be able to successful receive and send 3G SMS when the DVB-H application is active.

Initial Configuration
The UE shall be in good DVB-H and 3G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 3G network.

Test Procedure
Send an SMS to the UE. When received on the UE, read the SMS and then delete the SMS from the UE.
Repeat the above test 5 times.
Send an SMS from the UE under test to another handset used as base receiver.
Repeat the above test 5 times.

Expected Behaviour
The interaction between the SMS and the DVB-H functionality shall behave as per the UE vendor’s specification.
Verify that each SMS is correctly received by the UE under test.
Verify that each SMS can be read and then deleted.
Verify that each SMS, sent by the UE under test, is correctly received by the UE being used as a base receiver
Verify that the DVB-H application successfully recovers after each SMS

80.4.4 3G MMS Feature Interaction

Description
3G terminated and originated MMS whilst DVB-H application is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the user must be able to successful receive and send a 3G MMS when the DVB-H application is active.

Initial Configuration
The UE shall be in good DVB-H and 3G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 3G network.

Test Procedure
Send an MMS to the UE. When received on the UE, read the MMS and then delete the MMS from the UE.
Repeat the above test 5 times.
Send an MMS from the UE under test to another handset used as base receiver.
Repeat the above test 5 times.
**Expected Behaviour**

The interaction between the MMS and the DVB-H functionality shall behave as per the UE vendor’s specification.

Verify that each MMS is correctly received by the UE under test.

Verify that each MMS can be read and then deleted.

Verify that each MMS, sent by the UE under test, is correctly received by UE being used as a the base receiver.

Verify that the DVB-H application successfully recovers after each MMS.

---

**80.4.5 2G Voice Call Feature Interaction**

**Description**

2G terminated voice call whilst DVB-H application is active.

**Related core specifications**

- ETSI TR 102377 - DVB-H Implementation Guidelines
- ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

**Reason for Test**

To ensure user satisfaction for TV and cellular services the user must be able to successful receive a 2G voice call when the DVB-H application is active.

**Initial Configuration**

The UE shall be in good DVB-H and 2G cellular network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to a 2G network.

**Test Procedure**

Call the UE. Answer the call each time and then hang up the call from the UE.

Repeat the test 10 times.

**Expected Behaviour**

The interaction between the call and the DVB-H functionality shall behave as per the UE vendor’s specification.

Verify that each call can be accepted and then terminated.

Verify that the DVB-H application successfully recovers after each call.

---

**80.4.6 2G SMS Feature Interaction**

**Description**

2G terminated and originated SMS whilst DVB-H application is active.

**Related core specifications**

- ETSI TR 102377 - DVB-H Implementation Guidelines
- ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

**Reason for Test**

To ensure user satisfaction for TV and cellular services the user must be able to successful receive and send a 2G SMS when the DVB-H application is active.

**Initial Configuration**

The UE shall be in good DVB-H and 2G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to a 2G network.

**Test Procedure**

Send an SMS to the UE. When received on the UE, read the SMS and then delete the SMS from the UE.

Repeat the above test 5 times.

Send an SMS from the UE under test to a handset used as base receiver.

Repeat the above test 5 times.

**Expected Behaviour**

The interaction between the SMS and the DVB-H functionality shall behave as per the UE vendor’s specification.

Verify that each SMS is correctly received by the UE under test.

Verify that each SMS can be read and then deleted.

Verify that each SMS, sent by the UE under test, is correctly received by the UE being used as a base receiver

Verify that the DVB-H application successfully recovers after each SMS

### 80.4.7 2G MMS Feature Interaction

**Description**

2G terminated and originated MMS whilst DVB-H application is active.

**Related core specifications**

ETSI TR 102377 - DVB-H Implementation Guidelines

ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

**Reason for Test**

To ensure user satisfaction for TV and cellular services the user must be able to successful receive and send a 2G MMS when the DVB-H application is active.

**Initial Configuration**

The UE shall be in good DVB-H and 2G cellular network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to a 2G network.

**Test Procedure**

Send an MMS to the UE. When received on the UE, read the MMS and then delete the MMS from the UE.

Repeat the above test 5 times.

Send an MMS from the UE under test to a handset used as base receiver.

Repeat the above test 5 times.

**Expected Behaviour**

The interaction between the MMS and the DVB-H functionality shall behave as per the UE vendor’s specification.

Verify that each MMS is correctly received by the UE under test.

Verify that each MMS can be read and then deleted.
Verify that each MMS, sent by the UE under test, is correctly received by the UE being used as a base receiver
Verify that the DVB-H application successfully recovers after each MMS

80.5 Cellular Mobility with DVB-H Active

80.5.1 2G Cell Reselection

Description
To verify that the UE performs 2G cell reselection successfully whilst DVB-H is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the UE must always remain connected to the cellular network whilst the user is using TV services.

Initial Configuration
The UE shall be in good DVB-H and 2G cellular network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to a 2G network.

Test Procedure
Move the UE around the 2G network so as to force the UE to perform cell reselection.
Repeat the test 10 times.

Expected Behaviour
Verify that 2G cell reselection has no bad effects on the DVB-H audio/video service.
Verify that the UE remains connected to the 2G network throughout the test.

80.5.2 2G Routing Area Update

Description
To verify that the UE performs 2G RAU successfully whilst DVB-H is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the UE must always remain connected to the cellular network whilst the user is using TV services.

Initial Configuration
The UE shall be in good DVB-H and 2G cellular network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI and GPRS attached to a 2G network.

Test Procedure
Wait for the UE to perform a periodic routing area update.
Expected Behaviour
Verify that 2G RAU has no bad effects on the DVB-H audio/video service.
Verify that the UE remains connected to the 2G network throughout the test.

80.5.3 2G Location Area Update
Description
To verify that the UE performs 2G LAU successfully whilst DVB-H is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the UE must always remain connected to the cellular network whilst the user is using TV services.

Initial Configuration
The UE shall be in good DVB-H and 2G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 2G network

Test Procedure
Wait for the UE to perform a periodic location area update.

Expected Behaviour
Verify that 2G LAU has no bad effects on the DVB-H audio/video service.
Verify that the UE remains connected to the 2G network throughout the test.

80.5.4 3G Out of Service
Description
UE goes out of, and then returns to, 3G network coverage whilst DVB-H is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the UE must regain cellular service when after loss of cellular network coverage even when the DVB-H is active.

Initial Configuration
The UE shall be in good DVB-H and 3G cellular network coverage.
Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.
Ensure that the cellular radio is active and IMSI attached to a 3G network

Test Procedure
1) Move the UE to a location where there is no 3G cellular network coverage but there is good DVB-H coverage.
2) Move the UE back into 3G network coverage area.
Expected Behaviour
The UE shall successfully reconnect to the 3G network when it returns into the coverage area of the 3G network. Verify that there is continuous DVB-H audio/video service.

80.5.5 2G Out of Service

Description
UE goes out of, and then returns to, 2G network coverage whilst DVB-H is active.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure user satisfaction for TV and cellular services the UE must regain cellular service when after loss of cellular network coverage even when the DVB-H is active.

Initial Configuration
The UE shall be in good DVB-H and 2G cellular network coverage.

Ensure that the DVB-H receiver is active and that the DVB-H application is running and a TV channel is being received.

Ensure that the cellular radio is active and IMSI attached to a 2G network

Test Procedure
1) Move the UE to a location where there is no 2G cellular network coverage but there is good DVB-H coverage.
2) Move the UE back into 2G network coverage area.

Repeat the test 5 times.

Expected Behaviour
The UE shall successfully reconnect to the 2G network when it returns into the coverage area of the 2G network. Verify that there is continuous DVB-H audio/video service.

80.6 DVB-H Radio Sensitivity

Description
The purpose of this test is to compare the DVB-H radio sensitivity of the UE under test against that of a benchmarked DVB-H radio receiver.

Related core specifications
ETSI TR 102377 - DVB-H Implementation Guidelines
ETSI EN 300744 - Framing structure, channel coding and modulation for digital terrestrial television

Reason for Test
To ensure the best user experience when viewing mobile TV services the radio sensitivity of any UE shall at least be as good as those UE’s that are already available on the market.

Initial Configuration
The UE under test and the benchmarked UE shall be in good DVB-H network coverage.

Ensure that the DVB-H receivers are active on both UE’s and that the DVB-H application is running and a TV channel is being received on both.

Place the UE’s side by side with their antennas in the same alignment (if possible).

Do not handle the UE’s during the test.
Test Procedure
Move the UE under test and the benchmark UE through an area of ‘variable’ fringe DVB-H coverage. During the test a record should be kept by the tester of the following ‘bad events’ on each UE. Both the number and duration of the events should be noted.

- Video Freezes
- Audio Freezes
- Video Distortion
- Audio Distortion
- Out-of-coverage algorithm is initiated

Expected Behaviour
The number and duration of occurrences of ‘bad events’ on the UE under test must not be significantly greater than the number and duration of ‘bad events’ on the benchmarked UE.

81 Generic Access Network (GAN)
Although GAN could be theoretically used in conjunction with any radio technology having an IP connectivity, this section deals with GAN over WiFi (IEEE) only.

WiFi specific test cases are out-of the scope of this section as this is not a 3GPP radio technology.

Default configuration for all test cases:

- The UE Connection Mode to WiFi/GAN is set to “Automatic”
- The UE is in “GAN preferred mode”.

81.1 GAN Registration

81.1.1 Paring to AP and GAN Registration

Description
GAN registration initiated by the UE.

Related 3GPP core specifications
TS 44.318 sub clause 6.2.1

Reason for test
Ensure that the UE, after having paired successfully to the Access Point (AP), is able to connect and register to the GAN network successfully.

Initial configuration
The UE is in Line Of Site and at a short distance of the AP.
No AP information is saved in the UE.
The UE is switched-on, in idle mode on GERAN.

Test procedure
1. Scan WiFi networks and connect to the available AP, entering the security key if needed.
2. Save the AP information into the UE. Switch-off and on the UE

Expected behaviour
In both cases, the AP search must be successful from the first scan and the UE should successfully connect and register to GAN through the AP.
Successful GAN registration could be checked by various means: GAN logo displayed on the screen, AP SSID replace or alternate with GSM PLMN operator name, launching Voice call creates packet data activity on the AP.

81.1.2 GAN registration establishment time

Description
Procedure to check time taken by the UE to connect automatically to the GAN network after switch-on

Related 3GPP core specifications
TS 44.318 sub clause 6

Reason for test
Ensure that the UE is able to connect automatically to the GAN network in a user acceptable time.

Initial configuration
The AP information is saved in the UE.
The UE is switched-on, in idle mode on GERAN, outside of the AP/GAN coverage.
Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
1. The UE is switched-off, carried under WiFi coverage closed to the AP and switched-on.
2. Staying at that location, the UE is switched-off again and, after one minute, switched-on.

Expected behaviour
In both cases, the UE should connect automatically to the GAN network in a user acceptable time, comparable with the reference mobile performances (for example within 10%).

81.2 Voice calls

81.2.1 Mobile Originated Calls

Description
Outgoing voice call made through GAN.

Related 3GPP core specifications
TS 44.318 sub clause 7.4

Reason for test
The UE shall successfully make an outgoing voice call.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
1. Make a voice call to an ISDN number. Ensure that the call completes, and that the distant party receives the correct CLIP information. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).
2. Make a voice call to a PSTN number. Ensure that the call completes. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).
3. Make a voice call to a PBX extension. Ensure that the call completes. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).
4. Make a voice call to a non-GAN Mobile number. Ensure that the call completes. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).
In each case, check that Call Waiting Notification, COLP and SS notification (such as "call is forwarded") is correctly displayed and does not disturb the call setup. Check that alerting tone is audible at the UE and that voice connection in both directions is established.

**Expected behaviour**

The UE completes each call correctly. COLP, Call Waiting and SS notification information is correctly displayed, alerting indication is audible, and a voice connection in both directions is established.

### 81.2.2 Mobile terminated Calls

**Description**

Incoming voice call made through GAN.

**Related 3GPP core specifications**

TS 44.318 sub clause 7

**Reason for test**

The UE shall successfully receive an incoming voice call.

**Initial configuration**

The UE is GAN registered, in Idle Mode under the AP coverage.

**Test procedure**

1. Receive a call from an analogue PSTN phone. If CLIP information is available, ensure it is correctly displayed. Answer the call and ensure that a connection has been made. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).

2. Receive a call from an ISDN phone. Ensure that CLIP information is correctly displayed. Answer the call and ensure that a connection has been made. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).

3. Receive a call from a PBX extension. Ensure that CLIP information is correctly displayed. Answer the call and ensure that a connection has been made. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).

4. Receive a call from a non-GAN Mobile phone. Ensure that CLIP information is correctly displayed. Answer the call and ensure that a connection has been made. Check that the call effectively transits through GAN (e.g. by checking the packet data activity on the AP).

**Expected behaviour**

CLIP information is correctly displayed, alerting indication is audible, and a voice connection in both directions is established when the user answers the call.

### 81.2.3 Emergency Call under GAN coverage, ECMP = GERAN preferred

**Description**

Emergency call performed under GAN coverage with ECMP = “GERAN preferred”

**Related 3GPP core specifications**

TS 43.318 sub clause 8.21.1

TS 44.318 sub clause 11.2.14

**Reason for test**

If GERAN cell available and allowable, the UE shall leave GAN (rove out), complete the EC onto GERAN and revert to GAN once call is completed.

**Initial configuration**

The UE is GAN registered, in Idle Mode under the AP coverage.

GAN network Emergency Call Mode Preference (ECMP) is set to “GERAN Preferred”.
Test procedure

Make an emergency call to the international emergency number 112 in both cases:

1. GERAN coverage is present, PLMN being available and allowable
2. GERAN coverage is present, PLMN being not allowable (competitor network)
3. no GERAN coverage present

Expected behaviour

1. UE reselects from GAN to GERAN before emergency set-up. Should be checked with the GAN & GERAN status icons.

   Emergency call is correctly performed through GERAN: check if specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services.

   Once emergency call is hung up, the UE should reselect back from GERAN to GAN after a while (expiry of a penalty timer).

   Check then that UE has correctly performed a LU and is accessible under GAN by making a mobile terminated voice call.

2./3. Emergency call is correctly performed through GAN: check GAN status icon, check if specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services.

   Once emergency call is hung up, check then that the UE is still accessible by making a mobile terminated voice call.

81.2.4 Emergency Call under GAN coverage, ECMP = GAN preferred

Description

Emergency call performed under GAN coverage with ECMP = “GAN preferred”

Related 3GPP core specifications

TS 43.318 sub clause 8.21.1
TS 44.318 sub clause 11.2.14

Reason for test

The UE shall complete the EC correctly onto GAN.

Initial configuration

The UE is GAN registered, in Idle Mode under the AP coverage.

GAN network Emergency Call Mode Preference (ECMP) is set to “GAN Preferred”.

Test procedure

Make an emergency call to the international emergency number 112 for each case:

1. GERAN coverage is present, PLMN being available and allowable.
2. GERAN coverage is present, PLMN being not allowable (competitor network)
3. no GERAN coverage present

Expected behaviour

For all three cases, emergency call is correctly performed through GAN: check GAN status icon, check if specific emergency call set-up MMI is correctly displayed, alerting indication is audible, and a voice connection in both directions is established with the emergency services.

Once emergency call is hung up, check then that the UE is still accessible by making a mobile terminated voice call.
81.3 SMS

81.3.1 SMS Sending

Description
Send SMS under GAN coverage.

Related 3GPP core specifications
TS 44.318

Reason for test
The terminal must be able to send SMS under GAN coverage

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send to a non-GAN UE an SMS message of 160 characters. Check that it is correctly received at its destination.

Expected behaviour
The UE should be able to send successfully the SMS and inform the user that it has been correctly sent.

81.3.2 SMS Reception

Description
Receive SMS under GAN coverage.

Related 3GPP core specifications
TS 44.318

Reason for test
The terminal must be able to receive SMS under GAN coverage

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
With a non-GAN UE, create and send an SMS message of 160 characters to the tested UE. Verify that the SMS is properly received.

Expected behaviour
The UE should be able to receive successfully the SMS and display it

81.4 MMS

81.4.1 MMS Sending

Description
Send Multimedia Messages under GAN coverage.

Related 3GPP core specifications
TS 44.318

Reason for test
The terminal must be able to send MMS under GAN coverage
Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
Using the MMI procedures defined by the manufacturer, create and send to a non-GAN UE an MMS with multimedia contents. Check that it is correctly received at its destination.

Expected behaviour
The UE should be able to send successfully the MMS and inform the user that it has been correctly sent.

81.4.2 MMS Reception

Description
Receive Multimedia Messages under GAN coverage.

Related 3GPP core specifications
TS 44.318

Reason for test
The terminal must be able to receive MMS under GAN coverage

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
With a non-GAN UE, create and send an MMS with multimedia contents to the tested UE. Verify that the MMS is properly received.

Expected behaviour
The UE should be able to receive successfully the MMS and display its contents.

81.5 WAP Browsing

81.5.1 Browsing connection success

Description
WAP browsing through GAN.

Related 3GPP core specifications
TS 44.318 sub clause 8

Reason for test
To ensure that the UE is able to browse WAP through GAN

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.

Test procedure
Perform a connection to a WAP homepage and browse across five links.

Expected behaviour
The tested handset must be able to connect and browse successfully the different pages through GAN.

81.5.2 Browsing connection time

Description
Procedure to check time taken by the UE to connect to a WAP.
Related 3GPP core specifications
TS 44.318 sub clause 8

Reason for test
Ensure that the UE is able to connect to WAP via GAN network within a user acceptable time.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
Perform a connection to a WAP homepage and measure the time to display the page.

Expected behaviour
The UE should connect to WAP though GAN network in a user acceptable time, comparable with the reference mobile performances (for example within 10%).

81.6 Media Download and Streaming

81.6.1 Download

Description
Audio & Video File download through GAN

Related 3GPP core specifications
TS 44.318

Reason for test
Ensure that the terminal is able to download and then play an audio/video streaming content through GAN.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
Download an audio/video file and play the content

Expected behaviour
The UE should be able to download via GAN and play successfully the media content.
Download establishment time should be acceptable, comparable with the reference mobile performances (for example within 10%).

81.6.2 Streaming

Description
Audio & Video streaming connection through GAN

Related 3GPP core specifications
TS 44.318

Reason for test
Ensure that the terminal is able to stream audio/video content through GAN.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
Use a reference mobile from a different vendor which is GAN capable for comparison.
Test procedure
Browse to a video streaming link and play the content.

Expected behaviour
The UE should be able to stream successfully an audio/video media content via GAN.
Connection establishment time and audio/video quality should be acceptable, comparable with the reference mobile performances (for example within 10%).

81.7 Mobility GAN-GERAN

81.7.1 Reselection from GAN to GERAN (Rove-out)
Description
UE reselection from GAN to GERAN in Idle Mode (rove-out)

Related 3GPP core specifications
TS 44.318

Reason for test
The UE should reselect correctly from GAN to GERAN.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
GERAN covers the test area.

Test procedure
Move outside the GAN coverage until reselection criteria are met. Ensure that UE performs reselection to GERAN as expected. During the reselection it is imperative the UE remains in service at all times, and that it can receive a call before and after the reselection.

Expected behaviour
The UE should perform reselection correctly, perform Location Update accordingly, without losing service, and it should be able to receive calls before and after the reselection.

81.7.2 Reselection from GERAN to GAN (Rove-in)
Description
UE reselection from GAN to GERAN in Idle Mode (rove-in)

Related 3GPP core specifications
TS 44.318

Reason for test
The UE should reselect correctly from GERAN to GAN.

Initial configuration
The UE is in Idle Mode under GERAN coverage.
GAN signal is not present.

Test procedure
Move inside the GAN coverage. Ensure that UE performs reselection to GAN as expected. During the reselection it is imperative the UE remains in service at all times, and that it can receive a call before and after the reselection.

Expected behaviour
The UE should perform reselection correctly, perform Location Update accordingly, without losing service, and it should be able to receive calls before and after the reselection.
81.7.3 Circuit Switched Handover GAN to GERAN

Description
Voice call handover from GAN to GERAN.

Related 3GPP core specifications
TS 44.318 sub clause 7.8

Reason for test
The UE should perform voice handover from GAN to GERAN without any drop call.

Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
GERAN covers the test area.

Test procedure
Make a voice call to PSTN or non-GAN mobile number.
Move outside the GAN coverage until the handover is triggered by the network.

Expected behaviour
The UE should perform handover correctly, without dropping the call. Voice quality should not be noticeably affected (interruption, white noise...) by the handover.

81.7.4 Circuit Switched Handover GERAN to GAN

Description
Voice call handover from GERAN to GAN,

Related 3GPP core specifications
TS 44.318 sub clause 7.7

Reason for test
The UE should perform voice handover from GERAN to GAN seamlessly.

Initial configuration
The UE is in Idle Mode under GERAN coverage.
GAN signal is not present.

Test procedure
Make a voice call to PSTN or non-GAN mobile number.
Move inside the GAN coverage area until getting a good signal level.

Expected behaviour
The UE should perform handover correctly, without dropping the call. Voice quality should not be noticeably affected (interruption, white noise...) by the handover.

81.7.5 Packet Switched mobility GAN to GERAN

Description
Streaming transfer mobility from GAN to GERAN.

Related 3GPP core specifications
TS 44.318 sub clause 8

Reason for test
The UE should perform streaming transfer mobility from GAN to GERAN without any interruption.
Initial configuration
The UE is GAN registered, in Idle Mode under the AP coverage.
GERAN covers the test area.
Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
Browse to a video streaming link and play the content.
Move outside the GAN coverage until the reselection is triggered.

Expected behaviour
The UE should perform reselection correctly, without interruption the streaming transfer. Audio/video quality should not be noticeably affected by the reselection, comparable with the reference mobile performances.

81.7.6 Packet Switched mobility GERAN to GAN

Description
Streaming transfer mobility from GERAN to GAN

Related 3GPP core specifications
TS 44.318 sub clause 8

Reason for test
The UE should perform streaming transfer mobility from GERAN to GAN seamlessly.

Initial configuration
The UE is in Idle Mode under GERAN coverage.
GAN signal is not present.
Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
Browse to a video streaming link and play the content.
Move inside the GAN coverage area until getting a good signal level.

Expected behaviour
The UE should perform reselection correctly, without interruption the streaming transfer. Audio/video quality should not be noticeably affected by the reselection, comparable with the reference mobile performances.

81.8 Mobility GAN-UTRAN

81.8.1 Reselection from GAN to UTRAN (Rove-out)
[To be defined]

81.8.2 Reselection from UTRAN to GAN (Rove-in)

Description
UE reselection from UTRAN to GAN in Idle Mode (rove-in)

Related 3GPP core specifications
TS 44.318

Reason for test
The UE should reselect correctly from UTRAN to GAN.
Initial configuration
The UE is in Idle Mode under UTRAN coverage.
GAN signal is not present.

Test procedure
Move inside the GAN coverage. Ensure that UE performs reselection to GAN as expected. During the reselection it is imperative the UE remains in service at all times, and that it can receive a call before and after the reselection.

Expected behaviour
The UE should perform reselection correctly, perform Location Update accordingly, without losing service, and it should be able to receive calls before and after the reselection.

81.8.3 Circuit Switched Handover GAN to UTRAN
[To be defined]

81.8.4 Circuit Switched Handover UTRAN to GAN
[To be defined]

81.8.5 Packet Switched mobility GAN to UTRAN
[To be defined]

81.8.6 Packet Switched mobility UTRAN to GAN

Description
Streaming transfer mobility from UTRAN to GAN

Reason for test
The UE should perform streaming transfer mobility from UTRAN to GAN seamlessly.

Initial configuration
The UE is in Idle Mode under UTRAN coverage.
GAN signal is not present.

Use a reference mobile from a different vendor which is GAN capable for comparison.

Test procedure
Browse to a video streaming link and play the content.
Move inside the GAN coverage area until getting a good signal level.

Expected behaviour
The UE should perform reselection correctly, without interruption the streaming transfer. Audio/video quality should not be noticeably affected by the reselection, comparable with the reference mobile performances.

82 Global Positioning System (GPS)

82.1 Time To First Fix (TTFF)

82.1.1 TTFF – Standalone

Description
Time to First Fix (TTFF) is the time taken by the GPS receiver to provide the first location position fix after it is switched on.
Only the ‘Cold Start’ scenario is tested in this test case because:

- It stimulates the most fundamental operation within the GPS receiver.
- It is repeatable.
- It is easily comparable to a benchmarked GPS receiver.
- It reduces the complexity of the test.

‘Cold Start’ means that the GPS receiver has no prior knowledge of the GPS satellite constellation or the radio frequencies it should scan for before it is activated. i.e. the terminals GPS ‘memory’ is empty prior to the location position fix procedure being initiated.

In this test the DUT shall be compared to a market leading, benchmarked, GPS receiver. This benchmarked terminal may either be a dedicated GPS receiver (i.e. contain no cellular radio) or another cellular terminal with integrated GPS capability.

**Related 3GPP core specifications**

N/A

**Reason for test**

To ensure customer satisfaction with location services the TTFF performance of the GPS receiver within a terminal must be comparable to the leading GPS receivers available on the market.

**Initial configuration**

1. Ensure that the DUT is in good GSM or UMTS coverage.
2. Switch the DUT on and ensure that it registers to the GSM or UMTS network and enters idle mode.
3. Ensure that the DUT’s GPS receiver is switched off.
4. The tester must ensure that the DUT’s GPS memory is empty of any ephemeris data relating to the GPS satellites. It is envisaged that this will be achieved by either re-flashing the terminal or performing a master reset to ensure that the DUT is restored to its ‘out of box’ status.
5. Ensure that the benchmarked GPS receiver’s memory is empty of any ephemeris data relating to the GPS satellites.
6. The DUT and benchmarked GPS receiver shall be positioned side by side.
7. Ensure that the DUT and benchmarked GPS receiver have direct line of sight visibility to the sky.

**Test procedure**

1. Ensure that a stop watch is zeroed and ready.
2. Activate the GPS receiver within the DUT and the benchmarked GPS receiver simultaneously.
3. Start the stop watch.
4. Record the time taken by the DUT to calculate a location fix.
5. Record the time taken by the benchmark GPS receiver to calculate a location fix.
6. Note the latitude and longitude of the fixes obtained by the DUT and benchmark GPS receiver.

**Expected behaviour**

The time taken by the DUT to obtain a location fix shall be equivalent or less than the benchmarked GPS receiver.

The location accuracy of the DUT’s first location fix shall equivalent to the benchmarked GPS receiver.

**82.1.2 TTFF – UMTS/GSM Interworking**

**Description**

As per test 82.1.1, but in this test we also make UMTS and GSM call(s) during the test.
The test must be repeated for each and every UMTS and GSM band that the terminal supports to ensure that interference from each individual band does not affect the performance of the GPS receiver. For example if the terminal supports GSM 900/1800/1900 and UMTS 850/1900/2100 then the test would need to be executed 6 times i.e. once for each of the different band/technology combinations.

Related 3GPP core specifications

N/A

Reason for test

As per test 82.1.1, however in this test case we also check to see that active UMTS and GSM calls do not impact the performance of the GPS receiver.

Initial configuration

1. Ensure that the DUT is in good GSM or UMTS coverage.
2. Ensure that the DUT’s GPS receiver is switched off.
3. The tester must ensure that the DUT’s GPS memory is empty of any ephemeris data relating to the GPS satellites. It is envisaged that this will be achieved by either re-flashing the terminal or performing a master reset to ensure that the DUT is restored to its ‘out of box’ status.
4. Ensure that the benchmarked GPS receiver’s memory is empty of any ephemeris data relating to the GPS satellites.
5. The DUT and benchmarked GPS receiver shall be positioned not closer than 1m to one another.
6. Ensure that the DUT and benchmarked GPS receiver have direct line of site visibility to the sky.

Test procedure

Repeat the following test procedure for each RF Band / Cellular Technology combination supported by the DUT:

1. Ensure that the DUT is location updated onto the required RF band / cellular technology.
2. Ensure that a stop watch is zeroed and ready.
3. Make a voice call on the DUT.
4. Activate the GPS receiver within the DUT and the benchmarked GPS receiver simultaneously.
5. Start the stop watch.
6. Record the time taken by the DUT to calculate a location fix.
7. Record the time taken by the benchmark GPS receiver to calculate a location fix.
8. Note the latitude and longitude of the fixes obtained by the DUT and benchmark GPS receiver.
9. Repeat the test for the other RF bands / cellular technologies supported by the DUT.

Expected behaviour

The time taken by the DUT to obtain a location fix shall be equivalent or less than the benchmarked GPS receiver for each iteration of the test case.

The location accuracy of the DUT’s first location fix shall equivalent to the benchmarked GPS receiver for each iteration of the test case.
82.2 Positioning Accuracy and Reliability

82.2.1 In-Car – Standalone

Description
This test case measures the DUT’s GPS receiver precision and reliability when tracking the terminals position inside a car.

In this test the DUT shall be compared to a market leading, benchmarked, GPS receiver. This benchmarked terminal may either be a dedicated GPS receiver (i.e. contain no cellular radio) or another cellular terminal with integrated GPS capability.

Related 3GPP core specifications
N/A

Reason for test
To ensure customer satisfaction with location services the position tracking performance and reliability of the GPS receiver within a terminal must be comparable to the leading GPS receivers available on the market.

Initial configuration
1. Ensure that the DUT is in good GSM or UMTS coverage.
2. Switch on the DUT and ensure that it location updates to the GSM or UMTS network.
3. Ensure that the DUT’s GPS receiver is switched on and that a location fix has been achieved.
4. Ensure that the benchmarked GPS receiver is switched on and that a location fix has been achieved.
5. The DUT and benchmark GPS receiver shall be positioned side by side. They shall be placed near the windshield/windscreen of the car so as to achieve exposure to the sky.
6. The DUT and benchmark GPS receiver shall remain in the same position within the car during the test.
7. The DUT and benchmark GPS receiver shall be connected to whatever equipment is necessary (a laptop PC for example) to take a log of each terminals GPS position throughout the test. Alternatively the tester may load software on to the DUT to generate the GPS position log file internally within the DUT.

Test procedure
1. GPS log file generation shall be initiated by the tester on both the DUT and the benchmark GPS receiver. The log files shall record position verses time for each receiver.
2. Both receivers shall be driven around a 6 mile / 10 KM dense urban test route.
3. At the end of the test route the log files from the DUT and benchmark receiver shall be saved.

Expected behaviour
The log files from the DUT and benchmarked GPS receiver shall be compared by the tester.

Using the time stamps within the log files as a reference the test shall compare the positioning accuracy of the DUT to the benchmarked GPS receiver.

The positioning accuracy and reliability of the DUT shall be comparable to the benchmarked GPS receiver.

The speed of the DUT to recover from any GPS coverage holes shall also be comparable to the benchmarked GPS receiver.

82.2.2 In-Car – UMTS/GSM Interworking

Description
This test case measures the DUT’s GPS receiver precision and reliability when tracking the terminals position inside a car whilst a call is in progress.
In this test the DUT shall be compared to a market leading, benchmarked, GPS receiver. This benchmarked terminal may either be a dedicated GPS receiver (i.e. contain no cellular radio) or another cellular terminal with integrated GPS capability.

The test must be repeated for each and every UMTS and GSM band that the terminal supports to ensure that interference from each individual band does not affect the performance of the GPS receiver. For example if the terminal supports GSM 900/1800/1900 and UMTS 850/1900/2100 then the test would need to be executed 6 times for each of the different band/technology combinations.

**Related 3GPP core specifications**

N/A

**Reason for test**

To ensure customer satisfaction with location services the position tracking performance and reliability of the GPS receiver within a terminal must be comparable to the leading GPS receivers available on the market.

**Initial configuration**

1. Ensure that the DUT is in good GSM or UMTS coverage throughout the test.
2. Switch on the DUT and ensure that it location updates to the GSM or UMTS network.
3. Ensure that the DUT’s GPS receiver is switched on and that a location fix has been achieved.
4. Ensure that the benchmarked GPS receiver is switched on and that a location fix has been achieved.
5. The DUT and benchmark GPS receiver shall be positioned a minimum of 1m apart from one another. They should be positioned near the windshield/windscreen of the car so as to achieve exposure to the sky.
6. The DUT and benchmark GPS receiver shall remain in the same position within the car during the test.
7. The DUT and benchmark GPS receiver shall be connected to whatever equipment is necessary (a laptop PC for example) to take a log of each terminals GPS position throughout the test. Alternatively the tester may load software on to the DUT to generate the GPS position log file internally within the DUT.

**Test procedure**

Repeat the following test procedure for each RF Band / Cellular Technology combination supported by the DUT:

1. Ensure that the DUT is location updated onto the required RF band / cellular technology.
2. Make a voice call on the DUT and keep the call active for the remainder of the test.
3. GPS log file generation shall be initiated by the tester on both the DUT and the benchmark GPS receiver. The log files shall record position verses time for each receiver.
4. Both receivers shall be driven around a 6 mile / 10 KM dense urban test route.
5. At the end of the test route the log files from the DUT and benchmark receiver shall be saved.
6. Repeat the test for the other RF bands / cellular technologies supported by the DUT.

**Expected behaviour**

The log files from the DUT and benchmarked GPS receiver shall be compared by the tester for each test iteration.

Using the time stamps within the log files as a reference the test shall compare the positioning accuracy of the DUT to the benchmarked GPS receiver.

The positioning accuracy and reliability of the DUT shall be comparable to the benchmarked GPS receiver.

The speed of the DUT to recover from any GPS coverage holes shall also be comparable to the benchmarked GPS receiver.
82.2.3 Pedestrian – Standalone

**Description**
This test case measures the DUT’s GPS receiver precision and reliability when tracking the terminals position at pedestrian level in a dense urban environment.

In this test the DUT shall be compared to a market leading, benchmarked, GPS receiver. This benchmarked terminal may either be a dedicated GPS receiver (i.e. contain no cellular radio) or another cellular terminal with integrated GPS capability.

**Related 3GPP core specifications**
N/A

**Reason for test**
To ensure customer satisfaction with location services the position tracking performance and reliability of the GPS receiver within a terminal must be comparable to the leading GPS receivers available on the market.

**Initial configuration**
1. Ensure that the DUT is in good GSM or UMTS coverage.
2. Switch on the DUT and ensure that it location updates to the GSM or UMTS network.
3. Ensure that the DUT’s GPS receiver is switched on and that a location fix has been achieved.
4. Ensure that the benchmarked GPS receiver is switched on and that a location fix has been achieved.
5. The DUT and benchmark GPS receiver shall be positioned side by side. They shall be placed near the windshield/windscreen of the car so as to achieve exposure to the sky.
6. The DUT and benchmark GPS receiver shall remain in the same position within the car during the test.
7. The DUT and benchmark GPS receiver shall be connected to whatever equipment is necessary (a laptop PC for example) to take a log of each terminals GPS position throughout the test. Alternatively the tester may load software on to the DUT to generate the GPS position log file internally within the DUT.

**Test procedure**
1. GPS log file generation shall be initiated by the tester on both the DUT and the benchmark GPS receiver. The log files shall record position verses time for each receiver.
2. Both receivers shall be walked around a 0.5 mile / 1 Km dense urban test route.
3. At the end of the test route the log files from the DUT and benchmark receiver shall be saved.

**Expected behaviour**
The log files from the DUT and benchmarked GPS receiver shall be compared by the tester.

Using the time stamps within the log files as a reference the test shall compare the positioning accuracy of the DUT to the benchmarked GPS receiver.

The positioning accuracy and reliability of the DUT shall be comparable to the benchmarked GPS receiver.

The speed of the DUT to recover from any GPS coverage holes shall also be comparable to the benchmarked GPS receiver.

82.2.4 Pedestrian – UMTS/GSM Interworking

**Description**
This test case measures the DUT’s GPS receiver precision and reliability when tracking the terminals position at pedestrian level in a dense urban environment and when an active voice call is in progress.
In this test the DUT shall be compared to a market leading, benchmarked, GPS receiver. This benchmarked terminal may either be a dedicated GPS receiver (i.e. contain no cellular radio) or another cellular terminal with integrated GPS capability.

The test must be repeated for each and every UMTS and GSM band that the terminal supports to ensure that interference from each individual band does not affect the performance of the GPS receiver. For example if the terminal supports GSM 900/1800/1900 and UMTS 850/1900/2100 then the test would need to be executed 6 times for each of the different band/technology combinations.

**Related 3GPP core specifications**

N/A

**Reason for test**

To ensure customer satisfaction with location services the position tracking performance and reliability of the GPS receiver within a terminal must be comparable to the leading GPS receivers available on the market.

**Initial configuration**

1. Ensure that the DUT is in good GSM or UMTS coverage throughout the test.
2. Switch on the DUT and ensure that it location updates to the GSM or UMTS network.
3. Ensure that the DUT’s GPS receiver is switched on and that a location fix has been achieved.
4. Ensure that the benchmarked GPS receiver is switched on and that a location fix has been achieved.
5. The DUT and benchmark GPS receiver shall be positioned a minimum of 1m apart from one another. They should be positioned near the windshield/windscreen of the car so as to achieve exposure to the sky.
6. The DUT and benchmark GPS receiver shall remain in the same position within the car during the test.
7. The DUT and benchmark GPS receiver shall be connected to whatever equipment is necessary (a laptop PC for example) to take a log of each terminals GPS position throughout the test. Alternatively the tester may load software on to the DUT to generate the GPS position log file internally within the DUT.

**Test procedure**

Repeat the following test procedure for each RF Band / Cellular Technology combination supported by the DUT:

1. Ensure that the DUT is location updated onto the required RF band / cellular technology.
2. Make a voice call on the DUT and keep the call active for the remainder of the test.
3. GPS log file generation shall be initiated by the tester on both the DUT and the benchmark GPS receiver. The log files shall record position verses time for each receiver.
4. Both receivers shall be driven around a 6 mile / 10 KM dense urban test route.
5. At the end of the test route the log files from the DUT and benchmark receiver shall be saved.
6. Repeat the test for the other RF bands / cellular technologies supported by the DUT.

**Expected behaviour**

The log files from the DUT and benchmarked GPS receiver shall be compared by the tester for each test iteration.

Using the time stamps within the log files as a reference the test shall compare the positioning accuracy of the DUT to the benchmarked GPS receiver.

The positioning accuracy and reliability of the DUT shall be comparable to the benchmarked GPS receiver.

The speed of the DUT to recover from any GPS coverage holes shall also be comparable to the benchmarked GPS receiver.
Annex G: Individual Test Scenario Classification and Proforma

This Annex contains the individual classification (i.e. whether a test applies to Field Test, Lab Test or both) of every single test scenario. It can also be used as a blank proforma to record the results of an individual test scenario.

For details of classification criteria refer to section IV.
Annex H: Glossary

For the purposes of this document, the following terms are defined.

Acceptable Cell:
A cell that the MS may camp on to make emergency calls

AP:
Access Point (WiFi)

Client:
The term Client refers to any device that is used to fulfil a Field Trial requirement but is not the Device Under Test.

DUT:
The term DUT refers to the “Device Under Test”. The terms MS and UEUT may also refer to the DUT.

Engineering Test Mode Display:
A mechanism to extract real time radio data from a Terminal to aid the testing and debugging of the Terminal. Typically this mechanism may either be internal to the Terminal via a built-in test application, or external to the Terminal via a PC based tool.

Externally Initiated Packet Data Session:
A PDP context that was established via the device under test from an external device such as a notebook with a suitable connection such as for example:

- A connection over USB and the use of the dial-up networking stack of the external device.
- A connection over USB and the use of a virtual network card driver
- Wireless connectivity via Bluetooth.
- Use of the device under test as a Wi-Fi Access Point to which the external device connects as a Wi-Fi client.

GPS:
Global Positioning System

ICC:
Integrated Circuit Card (ICC). It is always a physical and logical entity and, in the context of this document, either a SIM or a UICC (Please check TS 31.900 for more details).

RAT:
Radio Access Technology, e.g. GSM, W-CDMA, …

Suitable cell:
A cell that the MS may camp on to make any calls

Test Route:
A route preferably provided by the operator and contains ideally all mobility scenarios supported by the operator’s network.

In case no Test Route is or can be provided by the operator a test route will follow the limited set below.

In both cases the test route should not exceed 50 km in length or can be completed in approximately 30 min. during off-peak hours and normal road traffic conditions.

TTFF:
Time To First Fix
Other definitions may be found in 3GPP TR 21.905, "Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications"
### Annex I: Change Request Form

It is essential that formal Change Requests are raised to the GSM Association Terminal Steering Group if the Device Field and Lab Test Guidelines shall be modified.

A CR template is included in this document; just double-click the icon below to open it.

An example of how to complete the CR template is provided below.

---

#### Change Request Form

**Document Information**

Please complete all sections

<table>
<thead>
<tr>
<th>Document Title &amp; Official Doc No</th>
<th>Device Field and Lab Test Guidelines (TS.11)</th>
</tr>
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|----------------|-------------|-----------------|----------------|-------------|-------------------------|

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<th>Minor Change</th>
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<th>John Writer, Star Operator Ltd.</th>
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#### Document Summary

- **What are the reasons for creating this Change Request?** PBCCH tests are no longer required.
- **What are the Key Business Benefits of this new document or change?** Clean test specification document
- **Which Sections of the document are affected?** Annex A, Section 9.9 (deletion of a complete subsection)
- **What are the impacts on other GSMA Official Documents for example, PRDs, White Papers, Position Statements?** None.
- **Are there similar or related new documents or Change Requests going through the approval process?** No.

#### Document Quality Review

- DAG Coordinator
- Date of QA
- Comments
- Name of Reviewer
- Date of Review
- Comments

---
How to create CRs using this form:

1) Fill out the above form.

2) Obtain the latest version of TS.11 to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into TS.11 just in front of the clause containing the first piece of changed text. Delete those parts of the document which are not relevant to the change request.
## Annex J: Detailed Document Change Record

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<td>Annex A:</td>
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<td>• Various editorial and functional corrections to all sections</td>
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<td>• Addition of USSD tests in section 6.6</td>
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<td>Addition of test sections for SMS, SIM Application Toolkit, WAP and GPRS</td>
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<td>Addition of Test Case ‘Emergency call with CS fallback, Successful’ (FT38_033). Non-strategic Change.</td>
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<td>34.1.7</td>
<td></td>
<td>Addition of Test Case ‘Supplementary Services with CS fallback, Successful’ (FT38_033). Non-strategic Change.</td>
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<td></td>
<td>Creation of new section ‘Data Retry’ as Lab Tests (FT38_019r1). Non-strategic Change.</td>
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<td>40.5.1</td>
<td></td>
<td>Addition of two test cases for ‘Emergency calls, with SIM/USIM, no emergency number stored’ to cover SIM Locked UEs (FT38_034). Non-strategic Change.</td>
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<tr>
<td>40.5.2</td>
<td></td>
<td>Addition of three test cases for ‘Emergency calls, with SIM/USIM, emergency numbers stored on EF_{ECC}’ to cover SIM Locked UEs (FT38_034). Non-strategic Change.</td>
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<td>55.1.3</td>
<td>Correction and Update of Test Case ‘RCS-e Service availability after reboot and SIM card swap (Client Configuration Storage Management)’ to re-scope Test Procedure and Expected Result (FT39_016r2). Non-strategic Change.</td>
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<td>11.1</td>
<td>27.09.2012</td>
<td>Annex B:</td>
<td>20.1.1 Split up of section ‘IMSI Attach and Detach; Successful’ into four different test scenarios (FT39_021, FT39_022). Non-strategic Change.</td>
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<td>20.2.1 Split up of section ‘GPRS Attach and Detach; Successful’ into four different test scenarios (FT39_023, FT39_024). Non-strategic Change.</td>
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<td></td>
<td>20.3.1 Split up of section ‘Combined Attach and Detach; Successful’ into four different test scenarios (FT39_025, FT39_026). Non-strategic Change.</td>
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<td>Annex C:</td>
<td>30.1.1.5 Update of Test Case ‘Attach Reject, cause #11 &quot;PLMN not allowed&quot;’ to improve clarity (FT39_015). Non-strategic Change.</td>
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<td>30.1.3 Introduction of new section with 3 Test Cases for ‘Correct E-UTRAN behaviour of a UE with a 2G SIM’ (FT39_014r2). Non-strategic Change.</td>
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<td>Annex D:</td>
<td>40.1.1 Update of Test Case ‘Mobile originated call complete’ to streamline Test Case and improve test coverage (FT39_027). Non-strategic Change.</td>
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<td>40.1.2 Update of Test Case ‘Mobile originated call to occupied phone’ to streamline Test Case and improve test coverage (FT39_028). Non-strategic Change.</td>
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<td>40.1.3 Update of Test Case ‘Mobile originated call to international B-subscriber (with &quot;+&quot;)’ to streamline Test Case and improve test coverage (FT39_029). Non-strategic Change.</td>
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<td>40.2 Update of Test Case ‘Mobile terminated calls’ to streamline Test Case and improve test coverage (FT39_030). Non-strategic Change.</td>
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<td>40.3.1 Update of Test Case ‘Interrogation for the CLIP status (&quot;#30#&quot;)’ to streamline Test Case and improve test coverage (FT39_031). Non-strategic Change.</td>
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<td>40.3.2 Update of Test Case ‘Interrogation for the CLIR status (&quot;#31#&quot;)’ to streamline Test Case and improve test coverage (FT39_032). Non-strategic Change.</td>
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<td>55.2.2 Addition of Note to Test Case ‘User discovery in address book: Synchronizing contacts from an account (Internet account like Google, Facebook, Exchange)’ that support of this feature is optional (FT39_017r1). Non-strategic Change.</td>
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<tr>
<td>55.4.1</td>
<td>Addition of note to Test Case ‘Successful file transfer from phonebook (one-to-one). File from external memory / SD’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<tr>
<td>55.4.1</td>
<td>Addition of note to Test Case ‘Successful file transfer from phonebook (one-to-one). File from external memory / SD’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<tr>
<td>55.4.5</td>
<td>Addition of note to Test Case ‘One-to-one transfer rejected by the destination’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<tr>
<td>55.4.6</td>
<td>Addition of note to Test Case ‘Multiple one-to-one File transfer cancelled by the sender’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<tr>
<td>55.4.6</td>
<td>Update of Test Case ‘Multiple one-to-one File transfer cancelled by the sender’ to clarify on interruption of File Transfer (FT39_019r1). Non-strategic Change.</td>
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<tr>
<td>55.4.7</td>
<td>Addition of note to Test Case ‘Multiple one-to-one file transfer cancelled by the destination’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<tr>
<td>55.4.7</td>
<td>Update of Test Case ‘Multiple one-to-one file transfer cancelled by the destination’ to clarify on interruption of File Transfer (FT39_019r1). Non-strategic Change.</td>
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<td>55.4.8</td>
<td>Addition of note to Test Case ‘Unsuccessful transfer: Receiver does not answer’ that support of external memory and SD card is optional (FT39_018r1). Non-strategic Change.</td>
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<td>Annex G</td>
<td>Split up of section ‘IMSI Attach and Detach; Successful’ into four different test scenarios (FT39_021, FT39_022). Non-strategic Change.</td>
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<tr>
<td>20.1.1</td>
<td>Split up of section ‘GPRS Attach and Detach; Successful’ into four different test scenarios (FT39_023, FT39_024). Non-strategic Change.</td>
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<td>20.2.1</td>
<td>Split up of section ‘Combined Attach and Detach; Successful’ into four different test scenarios (FT39_025, FT39_026). Non-strategic Change.</td>
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<td>30.1.3</td>
<td>Introduction of new section with 3 Test Cases for ‘Correct E-UTRAN behaviour of a UE with a 2G SIM’ (FT39_014r2). Non-strategic Change.</td>
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<td>40.1.1</td>
<td>Update of Test Case ‘Mobile originated call complete’ (FT39_027). Non-strategic Change.</td>
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<tr>
<td>40.1.2</td>
<td>Update of Test Case ‘Mobile originated call to occupied phone’ (FT39_028). Non-strategic Change.</td>
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<tr>
<td>40.1.3</td>
<td>Update of Test Case ‘Mobile originated call to international B-subscriber (with “+”)’ (FT39_029). Non-strategic Change.</td>
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<td>40.2</td>
<td>Update of Test Case ‘Mobile terminated calls’ (FT39_030). Non-strategic Change.</td>
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<td>III</td>
<td>Rename term ‘MS/UE’ to ‘DUT’ (FT40_025). Non-strategic Change.</td>
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<td></td>
<td>Annex B:</td>
<td>Complete rework of section ‘Mobility’ to improve test coverage and test efficiency (FT40_015r1). Non-strategic Change.</td>
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<tr>
<td>25.2.2.2</td>
<td></td>
<td>22</td>
<td>Definition of absolute HS Data Throughput values for higher categories of devices in Test Case ‘Absolute Throughput Measure – Downlink FTP for HSPA PS RAB’ (FT40_041r1). Non-strategic Change.</td>
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<tr>
<td>25.2.2.1</td>
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<td></td>
<td>Addition of clarification for Test Case ‘Relative Throughput Measure – Downlink FTP for HSPA PS RAB’ to improve test execution (FT40_035r3). Non-strategic Change.</td>
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<tr>
<td>25.2.3.1</td>
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<td>Addition of clarification for Test Case ‘Relative Throughput Measure – Uplink FTP for HSPA PS RAB’ to improve test execution (FT40_036r3). Non-strategic Change.</td>
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<tr>
<td>25.2.3.2</td>
<td></td>
<td></td>
<td>Definition of absolute HS Data Throughput values for higher categories of devices in Test Case ‘Absolute Throughput Measure – Uplink FTP for HSPA PS RAB’ (FT40_041r1). Non-strategic Change.</td>
</tr>
<tr>
<td>25.3.4.1</td>
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<td></td>
<td>Addition of clarification for Test Case ‘Relative Downlink FTP Throughput for HSPA PS RAB during MultiRAB’ to improve test execution (FT40_037r3). Non-strategic Change.</td>
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<tr>
<td>25.3.5.1</td>
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<td></td>
<td>Addition of clarification for Test Case ‘Relative Uplink FTP Throughput for HSPA PS RAB during MultiRAB’ to improve test execution (FT40_038r3). Non-strategic Change.</td>
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<tr>
<td>Annex C:</td>
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<td>31.2.1</td>
<td>Update of Test Case ‘E-UTRA Handover’ to add a Dedicated Bearer as Scenario B (FT40_011). Non-strategic Change.</td>
</tr>
<tr>
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<td>31.2.2</td>
<td>Update of Test Case ‘E-UTRA &lt;-&gt; UTRA Handover, PS Data Transfer &amp; Voice Call (VoLTE)’ to add two new scenarios: Voice Call active (VoLTE) and FTP Download &amp; Voice Call active (VoLTE) (FT40_011). Non-strategic Change.</td>
</tr>
<tr>
<td>Annex D:</td>
<td></td>
<td>40.1.1</td>
<td>Rework of section ‘Mobile originated call complete’ to improve test coverage and test efficiency (FT40_016r1). Non-strategic Change.</td>
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<tr>
<td></td>
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<td>40.1.2</td>
<td>Rework of section ‘Mobile originated call to occupied phone’ to improve test coverage and test efficiency (FT40_017r1). Non-strategic Change.</td>
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<tr>
<td>40.1.4</td>
<td></td>
<td>Move of Test Case ‘Mobile origin. call complete (to ISDN phone); CLIR temporarily deactivated (*31#DN)’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<tr>
<td>40.1.5</td>
<td></td>
<td>Move of Test Case ‘Mobile origin. call complete (to ISDN phone); CLIR temporarily activated (#31#DN)’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<tr>
<td>40.2</td>
<td></td>
<td>Rework of section ‘Mobile terminated calls’ to improve test coverage and test efficiency (FT40_018r1). Non-strategic Change.</td>
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<tr>
<td>40.3</td>
<td></td>
<td>Move of complete section ‘Interrogation of line identification status’ to sections 42.7 ‘Calling Line Identification Presentation (CLIP)’ and 42.8 ‘CLIR’ incl. re-organisation of test cases to improve test efficiency (FT40_022, FT40_023). Non-strategic Change.</td>
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<tr>
<td>40.6.1.1</td>
<td></td>
<td>Rework and new split-up of Test Case ‘WB-AMR originated call to 2nd WB-AMR device’ to improve test coverage and test efficiency (FT40_031). Non-strategic Change.</td>
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<tr>
<td>40.6.1.2</td>
<td></td>
<td>Rework and new split-up of Test Case ‘WB-AMR terminated call from 2nd WB-AMR device’ to improve test coverage and test efficiency (FT40_032). Non-strategic Change.</td>
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<tr>
<td>41.1.8.1</td>
<td></td>
<td>Correction of Test Case ‘Default 7-bit alphabet (over 160 characters)’ to improve test execution (FT40_026). Non-strategic Change.</td>
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<tr>
<td>41.1.8.2</td>
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<td>Correction of Test Case ‘Extended default 7-bit alphabet (over 140 Bytes)’ to improve test execution (FT40_027). Non-strategic Change.</td>
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<td>41.1.8.3</td>
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<td>Correction of Test Case ‘UCS-2 alphabet (over 70 characters)’ to improve test execution (FT40_028). Non-strategic Change.</td>
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<td>41.1.10</td>
<td></td>
<td>Rework of section ‘MO SMS during call’ to improve test coverage and test efficiency (FT40_019r2). Non-strategic Change.</td>
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<tr>
<td>41.2.4</td>
<td></td>
<td>Rework of section ‘MT SMS during call’ to improve test coverage and test efficiency (FT40_20r1). Non-strategic Change.</td>
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<td>41.9.1</td>
<td></td>
<td>Correction of Test Case ‘Store SM on the SIM; when SIM memory full’ to improve test execution (FT40_014). Non-strategic Change.</td>
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<tr>
<td>42.2.6</td>
<td></td>
<td>Rework of Test Case ‘Bar All Outgoing Calls (BAOC) – With Basic Service’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<tr>
<td>42.2.7</td>
<td></td>
<td>Rework of Test Case ‘Bar Outgoing International Calls (BOIC) – With Basic Service’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<tr>
<td>42.2.8</td>
<td></td>
<td>Rework of Test Case ‘Bar Outgoing International Calls except Home Calls (BOIC-exHC) – With Basic Service’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<td>42.2.9</td>
<td></td>
<td>Rework of Test Case ‘Bar All Incoming Calls (BAIC) – With Basic Service’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<tr>
<td>42.2.10</td>
<td></td>
<td>Rework of Test Case ‘Bar All Incoming Calls when Roaming (BAIC-R) – With Basic Service’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<td>42.2.12.1</td>
<td>Rework of Test Case ‘General Deactivation of Barring Services – All Services’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<td>42.2.12.2</td>
<td>Rework of Test Case ‘General Deactivation of Barring Services – All Outgoing’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<td>42.2.12.3</td>
<td>Rework of Test Case ‘General Deactivation of Barring Services – All Incoming’ to improve test coverage and test efficiency (FT40_021r1). Non-strategic Change.</td>
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<td>42.3.4</td>
<td>Correction of Test Case ‘Call Waiting, waiting call indication’ to improve test applicability (FT40_029). Non-strategic Change.</td>
</tr>
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<td></td>
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<td>42.7</td>
<td>Creation of main section ‘Calling Line Identification Presentation (CLIP)’, incl. re-organisation of test cases to improve test efficiency (FT40_022). Non-strategic Change.</td>
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<td></td>
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<td>42.8</td>
<td>Creation of main section ‘Calling Line Identification Restriction (CLIR)’, incl. re-organisation of test cases to improve test efficiency (FT40_023). Non-strategic Change.</td>
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<td></td>
<td>45.1.1.1.7</td>
<td>Move of Test Case ‘Normal call complete, CLIR temporarily deactivated’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<td>45.1.1.1.8</td>
<td>Move of Test Case ‘Normal call complete, CLIR temporarily activated’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<td>45.2.3 (old)</td>
<td>Move of Test Case ‘CLIP activated’ to section 42.7 ‘Calling Line Identification Presentation (CLIP)’ to increase test efficiency (test case merger) (FT40_022). Non-strategic Change.</td>
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<td></td>
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<td>45.2.3</td>
<td>Renumbering of Test Case ‘MMS reception during a video telephony call’, formerly section 45.2.8 (FT40_024). Non-strategic Change.</td>
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<td></td>
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<td>45.2.4</td>
<td>Move of Test Case ‘CLIP deactivated’ to section 42.7 ‘Calling Line Identification Presentation (CLIP)’ to increase test efficiency (test case merger) (FT40_022). Non-strategic Change.</td>
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<td>45.2.5</td>
<td>Move of Test Case ‘Call Barring’ to section 42.2 ‘Call Barring telephony, SMS, fax and data’ to increase test efficiency (test case merger) (FT40_024). Non-strategic Change.</td>
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<td>45.2.6</td>
<td>Move of Test Case ‘Call Forwarding’ to section 42.1 ‘Call Forwarding telephony, fax and data’ to increase test efficiency (test case merger) (FT40_024). Non-strategic Change.</td>
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<td>45.2.7</td>
<td>Move of Test Case ‘Incoming SMS during a video call’ to section 41.2.4 ‘MT SMS during call’ to increase test efficiency (FT40_020r1). Non-strategic Change.</td>
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<td>51.1</td>
<td>Addition of Main Section ‘Voice over IMS (VoLTE)’ (FT40_011). Non-strategic Change.</td>
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<td>51.1.1</td>
<td>Addition of Headline ‘Registration and Authentication to IMS’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.1.2</td>
<td>Addition of various Test Cases for ‘Basic Voice cases – PS’ (FT40_011). Non-strategic Change.</td>
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<td>51.1.3</td>
<td>Addition of Test Case for 'Emergency Calls' (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.1.4</td>
<td>Addition of Headline ‘Supplementary Services according GSMA IR.92’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.1.5</td>
<td>Addition of Headline ‘VoLTE according GSMA IR.92 - CS [PS Voice preferred, CS Voice as secondary] with ISR’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.2</td>
<td>Addition of Main Section 'PS performances' (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.2.1</td>
<td>Addition of Headline ‘PS performances (good coverage - relative measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.2.2</td>
<td>Addition of Headline ‘PS performances (good coverage - absolute measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.2.3</td>
<td>Addition of Headline ‘PS performances (During Mobility Drive Tests - relative Measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.3</td>
<td>Renumbering of Main Section 'SMS over IMS' from 51.1 to 51.3 (FT40_011). Non-strategic Change.</td>
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<tr>
<td>53.1</td>
<td>Addition of clarification for Test Case 'List of Network Names' to improve test execution (FT40_039r1). Non-strategic Change.</td>
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<tr>
<td>55.4</td>
<td>Split up of section ‘File Transfer’ into two main sections for ‘Without Auto Accept’ and ‘File Transfer with Auto Accept’. Renumbering of Test Cases for ‘File Transfer without Auto Accept’ to 55.4.1-10 (FT40_040r3). Non-strategic Change.</td>
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<tr>
<td>55.4.2</td>
<td>Addition of 3 new Test Cases for ‘File Transfer with Auto Accept’ (FT40_040r3). Non-strategic Change.</td>
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<tr>
<td>55.6.17</td>
<td>Extension of Test Case ‘Chat 1 to many (chat group). Change chat 1 to 1 into one to many (chat group)’ based on GSMA Hotfixes (FT40_043). Non-strategic Change.</td>
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<td>55.6.23-37</td>
<td>Addition of 15 new Test Cases for ‘IM/Chat’ based on GSMA Hotfixes (FT40_042r1). Non-strategic Change.</td>
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<tr>
<td>55.7.2</td>
<td>Correction of Test Case ‘Incoming IM session (when the initial condition is file transfer): Accepted’ due to copy-paste errors (FT40_044). Non-strategic Change.</td>
<td></td>
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<tr>
<td>55.7.3</td>
<td>Correction of Test Case 'Incoming Voice Call (when the initial condition is file transfer): Accepted and ISH/VSH' due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<tr>
<td>55.7.5</td>
<td>Correction of Test Case 'Incoming File Transfer (when the initial condition is voice call): Accepted' due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<tr>
<td>55.7.7</td>
<td>Correction of Test Case 'Incoming File Transfer (when the initial condition is voice call together with image sharing): Accepted' due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<tr>
<td>55.7.8</td>
<td></td>
<td>Correction of Test Case ‘Incoming File Transfer (when the initial condition is voice call together with image sharing): Accepted after hanging up Voice Call’ due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<tr>
<td>55.7.8</td>
<td></td>
<td>Correction of Test Case ‘Incoming File Transfer (when the initial condition is voice call together with image sharing): Accepted after hanging up Voice Call’ to increase test accuracy (FT40_045). Non-strategic Change.</td>
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<tr>
<td>55.7.10</td>
<td></td>
<td>Correction of Test Case ‘Incoming File Transfer (when the initial condition is voice call together with video sharing): Accepted’ due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<tr>
<td>55.7.11</td>
<td></td>
<td>Correction of Test Case ‘Incoming File Transfer (when the initial condition is voice call together with video sharing): Accepted after hanging up Voice Call’ due to copy-paste errors (FT40_044). Non-strategic Change.</td>
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<td>55.7.11</td>
<td></td>
<td>Correction of Test Case ‘Incoming File Transfer (when the initial condition is voice call together with video sharing): Accepted after hanging up Voice Call’ to increase test accuracy (FT40_045). Non-strategic Change.</td>
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<tr>
<td>57.3.3.2</td>
<td></td>
<td>Addition of Note for Test Case ‘Support of EMAIL’ to improve test execution (FT40_033). Non-strategic Change.</td>
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<tr>
<td>57.3.3.3</td>
<td></td>
<td>Addition of Note for Test Case ‘Support of ANR (Additional Number)’ to improve test execution (FT40_034). Non-strategic Change.</td>
<td></td>
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<tr>
<td>40.1.4</td>
<td></td>
<td>Move of Test Case ‘Mobile origin. call complete (to ISDN phone); CLIR temporarily deactivated (*31#DN)’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
<td></td>
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<tr>
<td>40.1.5</td>
<td></td>
<td>Move of Test Case ‘Mobile origin. call complete (to ISDN phone); CLIR temporarily activated (#31#DN)’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<tr>
<td>40.3</td>
<td></td>
<td>Move of complete section ‘Interrogation of line identification status’ to sections 42.7 ‘Calling Line Identification Presentation (CLIP)’ and 42.8 ‘CLIR’ incl. re-organisation of test cases to improve test efficiency (FT40_022, FT40_023). Non-strategic Change.</td>
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<tr>
<td>40.6.1.1</td>
<td></td>
<td>Rework and new split-up of Test Case ‘WB-AMR originated call to 2nd WB-AMR device’ to improve test coverage and test efficiency (FT40_031). Non-strategic Change.</td>
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<tr>
<td>40.6.1.2</td>
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<td>Rework and new split-up of Test Case ‘WB-AMR terminated call from 2nd WB-AMR device’ to improve test coverage and test efficiency (FT40_032). Non-strategic Change.</td>
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<tr>
<td>40.6.2</td>
<td></td>
<td>Move of section 'WB-AMR Handover' to section 22.2.2 'Voice WB-AMR' to increase test efficiency (test case merger) (FT40_015r1). Non-strategic Change.</td>
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<tr>
<td>42.7</td>
<td></td>
<td>Creation of main section 'Calling Line Identification Presentation (CLIP)', incl. re-organisation of test cases to improve test efficiency (FT40_022). Non-strategic Change.</td>
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<tr>
<td>42.8</td>
<td></td>
<td>Creation of main section 'Calling Line Identification Restriction (CLIR)', incl. re-organisation of test cases to improve test efficiency (FT40_023). Non-strategic Change.</td>
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<tr>
<td>45.1.1.1.7</td>
<td></td>
<td>Move of Test Case ‘Normal call complete, CLIR temporarily deactivated’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<tr>
<td>45.1.1.8</td>
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<td>Move of Test Case ‘Normal call complete, CLIR temporarily activated’ to section 42.8 ‘Calling Line Identification Restriction (CLIR)’ to increase test efficiency (test case merger) (FT40_023). Non-strategic Change.</td>
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<td>45.2.3</td>
<td>(old)</td>
<td>Move of Test Case ‘CLIP activated’ to section 42.7 ‘Calling Line Identification Presentation (CLIP)’ to increase test efficiency (test case merger) (FT40_022). Non-strategic Change.</td>
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<td>45.2.3</td>
<td></td>
<td>Renumbering of Test Case ‘MMS reception during a video telephony call’, formerly section 45.2.8 (FT40_024). Non-strategic Change.</td>
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<tr>
<td>45.2.4</td>
<td></td>
<td>Move of Test Case ‘CLIP deactivated’ to section 42.7 ‘Calling Line Identification Presentation (CLIP)’ to increase test efficiency (test case merger) (FT40_022). Non-strategic Change.</td>
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<td>45.2.5</td>
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<td>Move of Test Case ‘Call Barring’ to section 42.2 ‘Call Barring telephony, SMS, fax and data’ to increase test efficiency (test case merger) (FT40_024). Non-strategic Change.</td>
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<td>45.2.6</td>
<td></td>
<td>Move of Test Case ‘Call Forwarding’ to section 42.1 ‘Call Forwarding telephony, fax and data’ to increase test efficiency (test case merger) (FT40_024). Non-strategic Change.</td>
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<td>45.2.7</td>
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<td>Move of Test Case ‘Incoming SMS during a video call’ to section 41.2.4 ‘MT SMS during call’ to increase test efficiency (FT40_020r1). Non-strategic Change.</td>
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<tr>
<td>51.1</td>
<td></td>
<td>Addition of Main Section ‘Voice over IMS (VoLTE)’ (FT40_011). Non-strategic Change.</td>
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<td>51.1.1</td>
<td></td>
<td>Addition of Headline ‘Registration and Authentication to IMS’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.1.2</td>
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<td>Addition of various Test Cases for ‘Basic Voice cases – PS’ (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.1.3</td>
<td></td>
<td>Addition of Test Case for ‘Emergency Calls’ (FT40_011). Non-strategic Change.</td>
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<td>51.1.4</td>
<td></td>
<td>Addition of Headline ‘Supplementary Services according GSMA IR.92’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.1.5</td>
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<td>Addition of Headline ‘VoLTE according GSMA IR.92 - CS [PS Voice preferred, CS Voice as secondary] with ISR’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.2</td>
<td></td>
<td>Addition of Main Section ‘PS performances’ (FT40_011). Non-strategic Change.</td>
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<td>51.2.1</td>
<td></td>
<td>Addition of Headline ‘PS performances (good coverage - relative measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.2.2</td>
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<td>Addition of Headline ‘PS performances (good coverage - absolute measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<td>51.2.3</td>
<td></td>
<td>Addition of Headline ‘PS performances (During Mobility Drive Tests - relative Measurement)’ as placeholder (test to be defined) (FT40_011). Non-strategic Change.</td>
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<tr>
<td>51.3</td>
<td></td>
<td>Renumbering of Main Section ‘SMS over IMS’ from 51.1 to 51.3 (FT40_011). Non-strategic Change.</td>
<td></td>
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<tr>
<td>55.4</td>
<td></td>
<td>Split up of section ‘File Transfer’ into two main sections for ‘Without Auto Accept’ and ‘File Transfer with Auto Accept’. Renumbering of Test Cases for ‘File Transfer without Auto Accept’ to 55.4.1-10 (FT40_040r3). Non-strategic Change.</td>
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<tr>
<td>55.4.2</td>
<td></td>
<td>Addition of 3 new Test Cases for ‘File Transfer with Auto Accept’ (FT40_040r3). Non-strategic Change.</td>
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<tr>
<td>55.6.23-37</td>
<td></td>
<td>Addition of 15 new Test Cases for ‘IM/Chat’ based on GSMA Hotfixes (FT40_042r1). Non-strategic Change.</td>
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<tr>
<td>11.3</td>
<td>14.03.2013</td>
<td>All Rename term ‘RCS-e’ to ‘RCS’ throughout the entire document for alignment (AP41/01, FT41_006r1). Non-strategic Change.</td>
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<td>Annex A:</td>
<td>Complete rework of section ‘Mobility’ (formerly ‘Handover’) to improve test coverage and test efficiency (FT41_021r3). Non-strategic Change.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Rework and split-up of Test Case ‘IMSI Attach’ to increase efficiency of Test Case (FT41_022r1). Non-strategic Change.</td>
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<td>4.3 Rework and split-up of Test Case ‘IMSI Detach’ to increase efficiency of Test Case (FT41_022r1). Non-strategic Change.</td>
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<td>9 Complete rework of section ‘GPRS / EGPRS’ (formerly ‘GPRS’) to improve test coverage and test efficiency (FT41_023r1). Non-strategic Change.</td>
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<td>10 Deletion of section ‘EGPRS’ as its requirements have been merged with section 9 (FT41_023r1). Non-strategic Change.</td>
<td></td>
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<td>11.1.1 Update and rename of Test Case ‘Location Updating with A5/3 Ciphering’ to increase efficiency of Test Case (FT41_028r1). Non-strategic Change.</td>
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<td></td>
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<td>11.2 Deletion of section ‘A5/3 Handover Scenarios’ as its requirements have been added to section 3 (FT41_021r3). Non-strategic Change.</td>
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<td>Annex B:</td>
<td>Complete rework of section ‘Mobility’ to improve test coverage and test efficiency (FT40_015r1). Non-strategic Change.</td>
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<td>Annex D:</td>
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<td>40.4</td>
<td></td>
<td>Rework and split up of Test Case ‘DTMF emission’ to improve test coverage and increase test efficiency (FT41_024r1). Non-strategic Change.</td>
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<tr>
<td>40.5.1</td>
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<td>Modification of Test Case ‘Emergency calls, with SIM/USIM, no emergency number stored’ to add notes for clarification for SIM Locked UEs (FT41_016r1). Non-strategic Change.</td>
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<td>40.6.5.1</td>
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<td>Rework and split up of Test Case ‘DTMF emission during WB-AMR call’ to improve test coverage and increase test efficiency (FT41_024r1). Non-strategic Change.</td>
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<tr>
<td>42.1.13</td>
<td></td>
<td>Rework and split up of Test Case ‘Display message of registered and activated call forwarding during MOC setup’ to improve test coverage and increase test efficiency (FT41_030). Non-strategic Change.</td>
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<tr>
<td>43.5.2.3</td>
<td></td>
<td>Rework and split up of Test Case ‘Incoming MMS during an active call’ to improve test coverage and increase test efficiency (FT41_025r1). Non-strategic Change.</td>
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<td>45</td>
<td></td>
<td>Complete rework of section ‘Circuit Switched Multimedia Telephony (Video Telephony)’ to improve test coverage and test efficiency (FT41_025r1). Non-strategic Change.</td>
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<td>51.1.3.1</td>
<td></td>
<td>Addition of a new Test Case Headline for ‘Basic Emergency Call Setup’, formerly section 55.1.3 (FT41_015). Non-strategic Change.</td>
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<td>51.1.3.2</td>
<td></td>
<td>Addition of a new section ‘Originating Identification Presentation (OIP)’ (FT41_015). Non-strategic Change.</td>
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<td>51.1.3.2.1</td>
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<td>Addition of a new Test Case for ‘OIP Active’ (FT41_015). Non-strategic Change.</td>
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<td>51.1.3.2.2</td>
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<td>Addition of a new Test Case for ‘OIP Inactive’ (FT41_015). Non-strategic Change.</td>
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<td>55.1.4</td>
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<td>Addition of Test Case ‘RCS Service availability (Initial start-up procedure) when conflict of clients into the device occurs’ to enhance test coverage (FT41_014r1). Non-strategic Change.</td>
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<tr>
<td>55.1.5</td>
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<td>Addition of Test Case ‘RCS Service availability (switch of clients) when embedded client and not-embedded client are present in a device’ to enhance test coverage (FT41_027r1). Non-strategic Change.</td>
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<td>55.4.2.1</td>
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<td>Modification of Test Case ‘Successful Auto Accept of the File Transfer Session’ for increased efficiency of testing (FT41_017). Non-strategic Change.</td>
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<td>55.4.2.2</td>
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<td>Modification of Test Case ‘File Size Warning Limit (sender + receiver)’ for increased efficiency of testing (FT41_017). Non-strategic Change.</td>
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<td>55.4.2.3</td>
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<td>Modification of Test Case ‘No Auto Accept option to user (receiver)’ for increased efficiency of testing (FT41_017). Non-strategic Change.</td>
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<td>55.6.7</td>
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<td>Modification of Test Case name ‘Closing a chat (by initiator) / Re-opening a chat (not by initiator)’ for clarification (FT41_020). Non-strategic Change.</td>
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<td>55.6.18</td>
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<td>Modification of Test Case ‘Chat 1 to many (Group Chat). Initiating a chat / add a new participant' to merge with former test cases from section 55.6.34 (FT41_019). Non-strategic Change.</td>
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<td>55.6.21</td>
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<td>Modification of Test Case 'Leaving a group chat (other than initiator) and attempts to re-join' to merge with former test cases from section 55.6.25 and 55.6.31 (FT41_018). Non-strategic Change.</td>
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<td>55.6.24</td>
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<td>Modification of Test Case ‘Inviting an Unregistered User’ to correct Test Procedure and Expected Result (FT41_029r1). Non-strategic Change.</td>
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<td>55.6.25</td>
<td>(old)</td>
<td>Deletion of Test Case ‘User Loses Connectivity (not the Creator of the Group Chat)’ as the content has been moved into section 55.6.21 (FT41_018). Non-strategic Change.</td>
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<tr>
<td>55.6.25</td>
<td>(new)</td>
<td>Modification of Test Case name ‘Re-Start a Group Chat (after timeout)’ for clarification. Renumbering Test Case from formerly section 55.6.26 (FT41_020). Non-strategic Change.</td>
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<td>55.6.26</td>
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<td>Modification of Test Case name ‘Simultaneous Re-start Group Chat (after timeout)’ for clarification. Renumbering Test Case from formerly section 55.6.27 (FT41_020). Non-strategic Change.</td>
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<tr>
<td>55.6.27</td>
<td></td>
<td>Renumbering of Test Case ‘Re-start a Group Chat with some users offline’ from formerly section 55.6.28 (FT41_020). Non-strategic Change.</td>
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<tr>
<td>55.6.28</td>
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<td>Modification of Test Case ‘Re-start a Group Chat with some users offline and adding more users. No new session is created’ to clarify and improve Test Procedure. Renumbering Test Case from formerly section 55.6.29 (FT41_029r1). Non-strategic Change.</td>
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<tr>
<td>55.6.29</td>
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<td>Modification of Test Case ‘Re-start a Group Chat with some users offline and adding more users. Offline user creates a new session’ to clarify and improve Test Procedure and Expected Behaviour. Renumbering Test Case from formerly section 55.6.30 (FT41_029r1). Non-strategic Change.</td>
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<td>55.6.30</td>
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<td>Modification of Test Case ‘Add a Same Participant’ to clarify Test Procedure. Renumbering Test Case from formerly section 55.6.32 (FT41_029r1). Non-strategic Change.</td>
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<td>55.6.31</td>
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<td>Deletion of Test Case ‘User abandons Group Chat and attempts to re-join’ as the content has been moved into section 55.6.21 (FT41_018). Non-strategic Change.</td>
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<td>55.6.31</td>
<td>(new)</td>
<td>Modification of Test Case ‘Too many Participants’ to clarify and improve Test Procedure and Expected Behaviour. Renumbering Test Case from formerly section 55.6.33 (FT41_029r1). Non-strategic Change.</td>
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<td>55.6.32</td>
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<td>Modification of Test Case ‘Consolidation of Participants List at Restart’ to clarify and improve Test Procedure and Expected Behaviour. Renumbering Test Case from formerly section 55.6.35 (FT41_029r1). Non-strategic Change.</td>
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<tr>
<td>55.6.33</td>
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<td>Modification of Test Case ‘Chat Invitation Auto Accept’ to clarify and improve Test Procedure and Expected Behaviour. Renumbering Test Case from formerly section 55.6.36 (FT41_029r1). Non-strategic Change.</td>
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<td>(old)</td>
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<tr>
<td>55.6.34</td>
<td>Renumbering of Test Case ‘Closing Group Chat (not Initiator)’ from formerly section 55.6.37 (FT41_019). Non-strategic Change.</td>
</tr>
<tr>
<td>(new)</td>
<td>Annex G:</td>
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<td></td>
<td>Rename term ‘RCS-e’ to ‘RCS’ throughout the entire document for alignment (AP41/01, FT41_006r1). Non-strategic Change.</td>
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<td>3</td>
<td>Complete rework of section ‘Mobility’ (formerly ‘Handover’) (FT41_021r3). Non-strategic Change.</td>
</tr>
<tr>
<td>4.3</td>
<td>Split-up of Test Case for 'IMSI Attach’ (FT41_022r1). Non-strategic Change.</td>
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<td>4.4</td>
<td>Split-up of Test Case for 'IMSI Detach’ (FT41_022r1). Non-strategic Change.</td>
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<td>9</td>
<td>Complete rework of section ‘GPRS / EGPRS’ (formerly ‘GPRS’) (FT41_023r1). Non-strategic Change.</td>
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<td>10</td>
<td>Deletion of section ‘EGPRS’ (FT41_023r1). Non-strategic Change.</td>
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<td>11.1.1</td>
<td>Rename of Test Case ‘Location Updating with A5/3 Ciphering’ (FT41_028r1). Non-strategic Change.</td>
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<td>11.2</td>
<td>Deletion of section ‘A5/3 Handover Scenarios’ (FT41_021r3). Non-strategic Change.</td>
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<tr>
<td>40.4</td>
<td>Change of Test Case title to ‘DTMF emission’ (FT41_024r1). Non-strategic Change.</td>
</tr>
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<td>40.6.5.1</td>
<td>Change of Test Case title to ‘DTMF emission during WB-AMR call’ (FT41_024r1). Non-strategic Change.</td>
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<tr>
<td>42.1.13</td>
<td>Split up of Test Case ‘Display message of registered and activated call forwarding during MOC setup’ (FT41_030). Non-strategic Change.</td>
</tr>
<tr>
<td>43.5.2.3</td>
<td>Split up of Test Case ‘Incoming MMS during an active call’ (FT41_025r1). Non-strategic Change.</td>
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<td>45</td>
<td>Complete rework of section ‘Circuit Switched Multimedia Telephony (Video Telephony)’ (FT41_025r1). Non-strategic Change.</td>
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<td>51.1.3.1</td>
<td>Addition of a new Test Case Headline for ‘Basic Emergency Call Setup’, formerly section 55.1.3 (FT41_015). Non-strategic Change.</td>
</tr>
<tr>
<td>51.1.3.2</td>
<td>Addition of a new section ‘Originating Identification Presentation (OIP)’ (FT41_015). Non-strategic Change.</td>
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<tr>
<td>51.1.3.2.1</td>
<td>Addition of a new Test Case for ‘OIP Active’ (FT41_015). Non-strategic Change.</td>
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<tr>
<td>51.1.3.2.2</td>
<td>Addition of a new Test Case for ‘OIP Inactive’ (FT41_015). Non-strategic Change.</td>
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<td>55.1.4</td>
<td>Addition of Test Case ‘RCS Service availability (Initial start-up procedure) when conflict of clients into the device occurs’ (FT41_014r1). Non-strategic Change.</td>
</tr>
<tr>
<td>55.1.5</td>
<td>Addition of Test Case ‘RCS Service availability (switch of clients) when embedded client and not-embedded client are present in a device’ (FT41_027r1). Non-strategic Change.</td>
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<td>55.6.25</td>
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11.4  13.06.2013

**Annex A:**

| 4.2 | Complete rework of section ‘Periodic Location Area Updating (2G)’ to increase efficiency of test cases (FT42_019r1). Non-strategic Change. |

**Annex B:**

<p>| 20.2.1.1 | Correction of Test Case ‘GPRS Attach’ due to a copy-paste-issue (FT42_014). Non-strategic Change. |</p>
<table>
<thead>
<tr>
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<tr>
<td>20.4.2</td>
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<td>20.4.2</td>
<td>Complete rework of section ‘Periodic Location Area Updating (3G)’ to increase efficiency of test cases (FT42_020). Non-strategic Change.</td>
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<td>Annex C:</td>
<td></td>
<td>30.1.3</td>
<td>Deletion of Main Section ‘Correct E-UTRAN behaviour of a UE with a 2G SIM’ as this section became redundant (FT42_023r1). Non-strategic Change.</td>
</tr>
<tr>
<td></td>
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<td>30.1.3.1</td>
<td>Deletion of Test Case ‘2G SIM E-UTRAN/GSM/WCDMA – Automatic Network Selection’ as this Test Case became redundant (FT42_023r1). Non-strategic Change.</td>
</tr>
<tr>
<td></td>
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<td>30.1.3.2</td>
<td>Deletion of Test Case ‘2G SIM E-UTRAN/GSM/WCDMA – Manual Network Selection’ as this Test Case became redundant (FT42_023r1). Non-strategic Change.</td>
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<td>30.1.3.3</td>
<td>Deletion of Test Case ‘2G SIM E-UTRAN/GSM/WCDMA – Manual Network Selection, EUTRAN only mode’ as this Test Case became redundant (FT42_023r1). Non-strategic Change.</td>
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<td>34.1.6</td>
<td>Addition of new Main Section ‘Emergency Call with CS Fall Back’ (FT42_029r1). Non-strategic Change.</td>
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<tr>
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<td>34.1.6.1</td>
<td>Renumbering of Test Case ‘Emergency call with CS fallback, Successful’ which was formerly TC 34.1.6 (FT42_029r1). Non-strategic Change.</td>
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<td>34.1.6.2</td>
<td>Addition of new Test Case Scenario ‘Emergency call CSFB failure - UE LTE-camped, supports CSFB, CSFB layer not present at UE location’ as place holder (FT42_029r1). Non-strategic Change.</td>
</tr>
<tr>
<td>Annex D:</td>
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<td>40.6.1</td>
<td>Rename and rework of section ‘WB-AMR - Mobile originated calls’ to streamline and increase efficiency of all Test Cases of this section (FT42_021). Non-strategic Change.</td>
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<td>40.6.2</td>
<td>Rename and rework of section ‘WB-AMR - Mobile Terminated calls’ to streamline and increase efficiency of all Test Cases of this section (FT42_021). Non-strategic Change.</td>
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<td>40.6.4</td>
<td>Rework of section ‘WB-AMR - WB-AMR Multicall’ to streamline and increase efficiency of all Test Cases of this section (FT42_021). Non-strategic Change.</td>
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<td>51.1.1.1</td>
<td>Addition of new Test Case Scenario ‘SIP Registration and Authentication Procedure – via “well known IM” APN (IR88)’ as place holder (FT42_029r1). Non-strategic Change.</td>
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<td>51.1.4.1</td>
<td>Renumbering of Main Section ‘Originating Identification Presentation (OIP)’ which was formerly section 51.1.3.2 (FT42_029r1). Non-strategic Change.</td>
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<td>51.1.4.1.1</td>
<td>Renumbering of Test Case ‘OIP Active’ which was formerly section 51.1.3.2.1 (FT42_029r1). Non-strategic Change.</td>
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<td>51.1.4.1.2</td>
<td>Renumbering of Test Case ‘OIP Inactive’ which was formerly section 51.1.3.2.1 (FT42_029r1). Non-strategic Change.</td>
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<td>51.2</td>
<td>Rename of Test Case ‘PS Performances’ to cover copy-paste-issue (FT42_026). Non-strategic Change.</td>
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<td>55</td>
<td></td>
<td>Update of Note in ‘Rich Communication Suite (RCS)’ on which Specifications are relevant and where they can be found (FT42_027r2). Non-strategic Change.</td>
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<td>55.1.1 Update of Test Case ‘RCS Service availability and User Discovery in address book (initial check of capabilities) after first-time successful configuration’ for clarification and improvement (FT42_027r2). Non-strategic Change.</td>
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<tr>
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<td>55.1.2 Update of Test Case ‘RCS Service availability after reboot. Configuration parameters still valid’ to clean-up Test Case descriptions (FT42_027r2). Non-strategic Change.</td>
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<tr>
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<td>55.1.3 Update of Test Case ‘RCS Service availability after reboot and SIM card swap (Client Configuration Storage Management)’ for clarification and improvement (FT42_027r2). Non-strategic Change.</td>
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<td>55.1.4 Update of Test Case ‘RCS Service availability (Initial start-up procedure) when conflict of clients into the device occurs’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<td>55.1.5 Update of Test Case ‘RCS Service availability (switch of clients) when embedded client and not-embedded client are present in a device’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<td>55.3.1 Update of Test Case ‘Successful capability query after a registration during a call’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<td>55.3.2 Update of Test Case ‘Successful capability query when a voice call returns to active after hold’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<td>55.3.3 Rename and rework of Test Case ‘Capability query: RCS user offline ungraceful/online’ and include content of TC 55.3.6 (FT42_027r2). Non-strategic Change.</td>
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<td>55.3.4 Rename and update of Test Case ‘Capability query in 1-2-1 chat (file transfer no longer available’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<tr>
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<td>55.3.5 Update of Test Case ‘Capability query in chat application: RCS user offline/online graceful’ for improvement of clarity of Test Case description (FT42_027r2). Non-strategic Change.</td>
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<tr>
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<td>55.3.6 Deletion of Test Case ‘Capability query in chat application: RCS user offline ungraceful/online’ as its requirement has been added to TC 55.3.3 (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.1 Rename and update of Test Case ‘Successful file transfer from phonebook (one-to-one)’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.2 Update of Test Case ‘Successful file transfer from File Transfer/gallery app (one-to-many)’ on minor editorial matters (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.3 Update of Test Case ‘Successful multiple file transfer from File Transfer/gallery app (one-to-many)’ on minor editorial matters (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.4</td>
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<td>Rename and update of Test Case ‘Successful file transfer from chat application (one-to-one) and IM/Chat session’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.5</td>
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<td>Rename and update of Test Case ‘One-to-one file transfer - rejected by the destination’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.6</td>
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<td>Update of Test Case ‘Multiple one-to-one File transfer cancelled by the sender’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.7</td>
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<td>Update of Test Case ‘Multiple one-to-one file transfer cancelled by the destination’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.1.8</td>
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<td>Update of Test Case ‘Unsuccessful transfer: Receiver does not answer’ to clarify on use of external memory (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.2.1</td>
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<td>Update of Test Case ‘Successful Auto Accept of the File Transfer Session’ on minor editorial matters (FT42_027r2). Non-strategic Change.</td>
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<td>55.4.2.2</td>
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<td>Update of Test Case ‘File Size Warning Limit (sender + receiver)’ on minor editorial matters (FT42_027r2). Non-strategic Change.</td>
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<td>Update of Test Case ‘No Auto Accept option to user (receiver)’ on minor editorial matters (FT42_027r2). Non-strategic Change.</td>
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<td>Update of Test Case ‘Basic sharing: call termination (image share)’ for correction and clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.5.3</td>
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<td>Update of Test Case ‘Video share: sending video – caller’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>Update of Test Case ‘Video share: sending video – receiver’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.5.11</td>
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<td>Rename of Test Case ‘Call on hold. Retrieve call on hold + restart video sharing’ (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.3</td>
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<td>Update of Test Case ‘Chat 1 to 1. Local black list’ for correction and clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.5</td>
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<td>Update of Test Case ‘Chat 1 to 1. Composing chat window / leaving background (MultiRAB + MMS). Notifications in background mode’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.7</td>
<td></td>
<td>Rename and update of Test Case ‘Closing a chat window(by initiator) / Re-opening a chat (not by initiator)’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.8</td>
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<td>Update of Test Case ‘Chat forced interruption’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.17</td>
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<td>Rename and update of Test Case ‘Change chat 1 to 1 into one to many (Group Chat)’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.18</td>
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<td>Rename and update of Test Case ‘Initiating a Group Chat / add new participants’ for clarification (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.19</td>
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<td>Deletion of Test Case ‘Notifications: “Is Typing” / “X has left”’ as its requirement is covered by TC 55.6.17 and 55.6.18 (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.20</td>
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<td>Rename and rework of Test Case 'Leaving a Group Chat' and transfer content of TC 55.6.34 into 55.6.20 (FT42_024r1). Non-strategic Change.</td>
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<td>55.6.21</td>
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<td>Update of Test Case 'Leaving a group chat (other than initiator) and attempts to re-join' for clarification (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.22</td>
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<td>Deletion of Test Case ‘Chat message limit’ as its requirement is covered by TC 55.6.17 and 55.6.18 (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.23</td>
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<td>Deletion of Test Case ‘Moving from a 1-to-1 Chat to a Group Chat’ as its requirement is covered by TC 55.6.17 and 55.6.18 (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.24</td>
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<td>Update of Test Case ‘Inviting an Unregistered User’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.25</td>
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<td>Update of Test Case ‘Re-Start a Group Chat (after timeout)’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.26</td>
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<td>Update of Test Case ‘Simultaneous Re-start Group Chat (after timeout)’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.27</td>
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<td>Update of Test Case ‘Re-start a Group Chat with some users offline’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.28</td>
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<td>Update of Test Case ‘Re-start a Group Chat with some users offline and adding more users. No new session is created’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
<td></td>
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<tr>
<td>55.6.29</td>
<td></td>
<td>Update of Test Case ‘Re-start a Group Chat with some users offline and adding more users. Offline user creates a new session’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.30</td>
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<td>Update of Test Case ‘Add a Same Participant’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.31</td>
<td></td>
<td>Update of Test Case ‘Too many Participants’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.32</td>
<td></td>
<td>Update of Test Case ‘Consolidation of Participants List at Restart’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<tr>
<td>55.6.33</td>
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<td>Update of Test Case ‘Chat Invitation Auto Accept’ for clarification and alignment (FT42_027r2). Non-strategic Change.</td>
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<td>55.6.34</td>
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<td>Deletion of Test Case ‘Closing Group Chat (not Initiator)’ as its requirement has been added to TC 55.6.20 (FT42_024r1). Non-strategic Change.</td>
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<td>56.0</td>
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<td>Update of Introduction of ‘SoR – Basic description of functionality to be tested’ to clarify test conditions (FT42_015). Non-strategic Change.</td>
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<td>57.1.1.9</td>
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<td>Update of Test Case ‘Unblocking of blocked PIN’ to provide clarification of Expected Result (FT42_016). Non-strategic Change.</td>
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<td>57.1.2.6</td>
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<td>Update of Test Case ‘Unblocking of blocked PIN2’ to provide clarification of Expected Result (FT42_016). Non-strategic Change.</td>
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<td>Update of Test Case ‘Read SMSP’ to improve terminology for UICC/USIM (FT42_017). Non-strategic Change.</td>
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