NFC Handset Test Book
Version 9.0
24 June 2016

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1 Introduction

1.1 Overview

The main aim of the GSMA NFC activities is to accelerate the commercial launch of UICC – based NFC services in a number of markets by ensuring interoperability of services.

This document applies both to devices supporting a standard removable UICC and to devices supporting an eUICC. As indicated in the definition of eUICC in section 1.3, an eUICC is a particular type of UICC. Therefore, when this document uses the term “UICC”, this incorporates both the standard UICC and the eUICC.

The eUICC related specifications are being developed by the GSMA and ETSI. A version of the GSMA specification including NFC support is planned to be published in the middle of 2016.

It may not be possible to perform all the test cases currently defined in TS.27 using an eUICC.

The NFC Test Book stream is part of GSMA NFC activities. The participating GSMA TSG members have developed a set of test cases to be used for testing primarily the UICC based NFC functionality within a Mobile Device. These tests have been collated in this “Test Book” and provide test case descriptions against the requirements listed in the GSMA TS.26 NFC Handset Requirements document [1].

The NFC Test Book contains test cases for the following versions of TS.26:

- GSMA TS.26 NFC Handset Requirements V5.0 [1a]
- GSMA TS.26 NFC Handset Requirements V6.0 [1b]
- GSMA TS.26 NFC Handset Requirements V7.0 [1c]
- GSMA TS.26 NFC Handset Requirements V8.0 [1d]
- GSMA TS.26 NFC Handset Requirements V9.0 [1]

This document includes an applicability table providing an indication whether test cases are relevant for a specific device operating system.

The Test Book is developed in such a way that the test case descriptions are generic, but provide repeatable instructions so that any accredited Test Lab can implement these test cases without further clarification.

The Test Lab will be responsible for running the test cases (which are tool specific) as set out in the Test Book.

1.2 Scope and Test Book structure

This document is intended for:

- Parties which develop test tools and platforms
- Test Labs / Test Houses which execute the testing

- Vendors, Device & chipset Manufacturers
- Operators

The Test Book consists of a set of test cases relevant for testing a device which is implementing primarily UICC based NFC services (i.e. devices implementing SWP protocol). The testing scope is related to selected parts of the NFC enabled device and is further detailed below.

The test cases specified within the Test Book are either specified fully, step by step or refer to existing publicly available test standards. For the test cases from other organizations, a unique reference to the specification and test case is provided.

For each test case specified or referred to within this Test Book, there is a reference to one or more requirements from the TS.26 GSMA NFC Handset Requirements document.[1]

1.2.1 Test Book scope

The scope of testing is identified below with the reference architecture for a NFC enabled device with UICC NFC services.

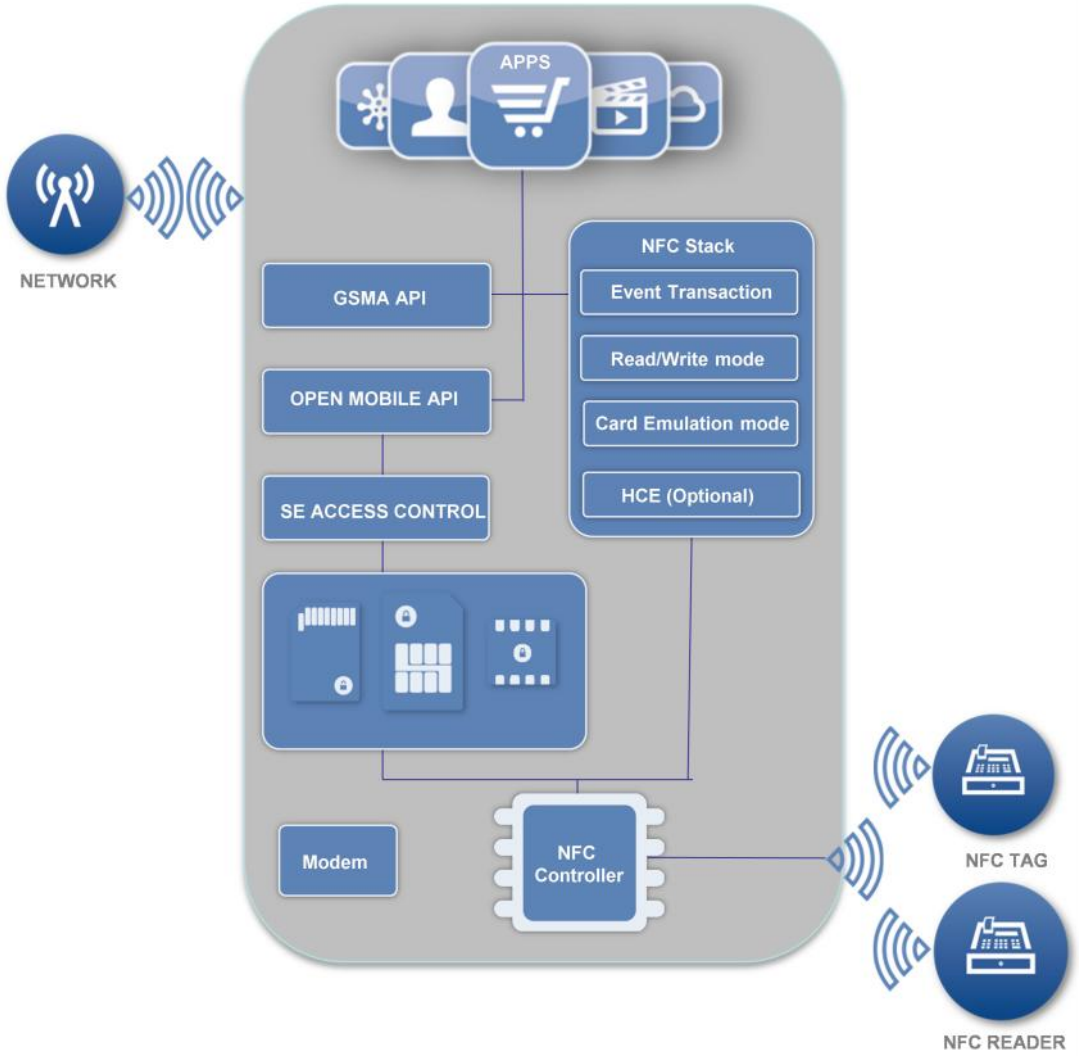


Figure 1: Reference architecture for a NFC enabled device with UICC NFC services

The overall structure of the Test Book is based on the interfaces as identified in the architecture showing relevant NFC related components. The first section starts with the Tag and Card reader interface, stepping through the different device components and ending at the Mobile network related features. This gives the following structure:

1. Introduction
2. Test Environment
3. NFC Features
   a) Reader / Writer mode
   b) Card emulation mode
   c) Core and common features
4. VOID (reserved for future test cases)
5. Secure Element Access Control
6. Secure Element Access API
7. Multiple Card Emulation Environment
8. UI Application Triggering
9. VOID (reserved for future test cases)
10. VOID (reserved for future test cases)
11. Mobile Device APN Management
12. Remote Management of NFC Services
    a) Basic Remote Management
    b) Remote Management use cases
13. General Device Support
14. VOID (reserved for future test cases)
15. Android specific test cases
16. Blackberry specific test cases
17. Microsoft Windows specific test cases
18. VOID
19. Other OS specific test cases

Annexes

Other OS specific test cases can be added based on contributions.

1.3 Definition of Terms

Term	Description
Active UICC Profile	When the physical UICC is a standard UICC: the UICC itself. When the physical UICC is an eUICC: the combination of the Enabled Profile and the eUICC onto which the Profile has been provisioned.
Card Emulation Environment	A Card Emulation Environment is an execution environment used together with a NFC controller to manage a Card Emulation transaction. It can be a Secure Element (e.g. UICC, embedded Secure Element or micro-SD) or an application running in a device host.
Embedded UICC	UICC which enables the secure remote and/or local management of profiles.

Term	Description
Default Route	The route to be used by the NFC controller for APDUs transmission when an AID is not found in the routing table.
Device	In the context of this specification, the term Device is used to represent any electronic equipment supporting NFC functionality into which a UICC-based NFC Secure Element can be inserted, and that provides a capability for a server to reach the UICC through an Over The Air (OTA) channel.
Distance	This refers to the distance from the back of the device to Point of Sale NFC antenna or to Tag surface.
Factory Reset	The action of the user to perform “device reset” to restore the factory configuration of the device. Note: The information on how to perform a factory reset shall be provided by the device manufacturer.
Multiple Active CEEs model	A model where the device can activate several CEE at the same time. RF traffic can be provided to a CEE based on routing mechanisms. Note: an implementation may support Multiple Active CEEs model in Battery Operational Mode and Single Active CEE model in Battery Low or Power-Off Mode.
Operator	Refers to a Mobile Network Operator who provides the technical capability to access the mobile environment using an Over The Air (OTA) communication channel. The OPERATOR is also the UICC Issuer. An OPERATOR provides a UICC OTA Management System, which is also called the OTA Platform.
Screen Lock	The device functionality can only be accessed via a user intervention.
Screen OFF	The battery of the device is in Battery Operational Mode and the screen of the device was turned off either by the end-user or automatically by the device after a timeout.
Screen ON	The battery of the device is in Battery Operational Mode and the screen of the device was turned on by the end-user (i.e. the screen is active).
Secure Element	A SE is a tamper-resistant component which is used to provide security, confidentiality, and multiple application environments required to support various business models.
Sensitive API	An API which shall be protected from malicious use.
Single Active CEE model	A model where the device only activates one CEE at a time. Other CEEs, if available, are not active.
Switched OFF	The device was turned OFF by the end-user or the device is in battery low mode or the device is in battery power-off mode.
Test Book	Document describing the test cases that allow testing the requirements listed in the GSMA TS.26 NFC Handset Requirements [1]
Test Lab	This refers to a test lab which will run the test cases according to the Test Book for testing NFC Devices.

Term	Description
Vendor	Device manufacturer

1.4 Abbreviations

Acronyms	Description
AC	Access Control
ACCF	Access Control Conditions File
ACMF	Access Control Main File
ACRF	Access Control Rules File
ADF	Application Dedicated File
AID	Application Identifier
APDU	Application Protocol Data Unit
API	Application Programming Interface
APN	Access Point Network
BIP	Bearer Independent Protocol
C-APDU	Command APDU
CE	Card Emulation
CEE	Card Emulation Environment
CEN	European Committee for Standardization
CLF	Contactless Frontend
CS	Circuit Switched
DODF	Data Object Directory File
DUT	Device Under Test
EMV	EMV specifications and related testing processes are managed by EMVCo. (Europay, MasterCard, Visa)
ETSI	European Telecommunication Standards Institute
eUICC	Embedded UICC
EVT	Event
FFS	For Future Study
GCF	Global Certification Scheme
HCE	Host Card Emulation
HCI	Host Controller Interface
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization

Acronyms	Description
JCP	Java Community Process
JSR	Java Specification Request
JVM	Java Virtual Machine
ME	Mobile Equipment
MIDP	Mobile Information Device Profile
MNO	Mobile Network Operator
MO	Mobile Originated
MT	Mobile Terminated
NFC	Near Field Communication
ODM	Original Device Manufacturer
OEM	Original Equipment Manufacturer
OS	Operating System
PCD	Proximity Coupling Device
PC/SC	PC SmartCard reader
PKCS	Public Key Cryptographic Standard
PoR	Proof of Receipt
PoS	Point of sale
PS	Packet Switched
R-APDU	Response APDU
RIL	Radio Interface Layer
RTD	Record Type Definition
RTS	Routing Table Size
SCWS	Smart Card Web Server
SE	Secure Element
SIM	Subscriber Identity Module
SP	Service Provider
STA	Smart Ticketing Alliance
SW	Status Word
SWP	Single Wire Protocol
UI	User Interface
UICC	Universal Integrated Circuit Card (USIM)
USS	UMTS System Simulator

1.4.1 Power mode definition

This section gives the definition for different battery modes for the support NFC services as shown in Figure 2.

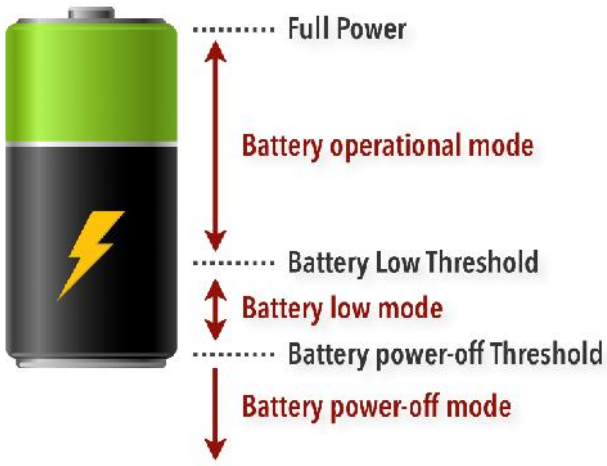


Figure 2: Battery power levels within the NFC mobile devices

Term	Description
Battery Operational Mode	The battery of the DUT has sufficient power to support all functions in the mobile devices.
Battery Low Mode	The battery of the DUT has reached “Battery Low Threshold” at which the display and most functionalities of the DUT are automatically switched off, except the clock and a few remaining functions. The battery of the DUT only has sufficient power to support NFC controller to function.
Battery Power-off Mode	The battery of the DUT has reached “Battery Power-off threshold” at which there is no residual power to support NFC controller to function. No functions are available in the DUT. The NFC controller can function if power is provided via the contactless interface (i.e. powered by the field).

1.5 Document Cross-References

Ref	Title
[1]	GSMA TS.26 NFC Handset Requirements v9.0
[1a]	GSMA TS.26 NFC Handset Requirements v5.0
[1b]	GSMA TS.26 NFC Handset Requirements v6.0
[1c]	GSMA TS.26 NFC Handset Requirements v7.0
[1d]	GSMA TS.26 NFC Handset Requirements v8.0

Ref	Title
[2]	VOID
[3]	VOID
[4]	VOID
[5]	SIMalliance OMAPI Transport API Test Specification V2.0
[6]	SIMalliance – Open Mobile API specification V2.05 or later (backwards compatible)
[7]	Global Platform – Secure Element Access Control V1.0
[8]	ETSI TS 102 221 (V9.2.0 or later) – UICC-Terminal interface – Physical and logical characteristics
[9]	ETSI TS 102 613 (V9.3.0 or later) – UICC – Contactless Front-end (CLF) Interface – Part 1: Physical and data link layer characteristics
[10]	ETSI TS 102 622 (V9.4.0 or later) – UICC – Contactless Front-end (CLF) Interface – Host Controller Interface (HCI)
[11]	ETSI TS 102 694-1 (V10.2.0 or later) – Test specification for the Single Wire Protocol (SWP) interface; Part 1: Terminal features
[12]	ETSI TS 102 695-1 (V12.0.0 or later) - Test specification for the Host Controller Interface (HCI); Part 1: Terminal features
[13]	ETSI TS 102 384 (V10.3.0 or later) – Card Application Toolkit (CAT) conformance specification
[14]	VOID
[15]	GCF WI – 35 – USAT Testing
[16]	GCF WI – 133 – SWP/HCI
[17]	VOID
[18]	VOID
[19]	NFC Forum-TS-Analog-1.1 (or later) NFC Forum-TS-Digital Protocol-1.0 (or later) NFC Forum-TS-Activity-1.0 (or later) NFCForum-TS-Type-1-Tag_1.2 (or later) NFCForum-TS-Type-2-Tag_1.2 (or later) NFCForum-TS-Type-3-Tag_1.2 (or later) NFCForum-TS-Type-4-Tag_2.0 (or later) NFC Forum Device Requirements_1.3 (or later) NFC Forum-TS-NDEF_1.0 (or later) NFC Forum Controller Interface 1.1 (or later)
[20]	3GPP TS 31.121 (V13.1.0 or later) – UICC-terminal interface; Universal Subscriber Identity Module (USIM) application test specification
[21]	3GPP TS 31.124 (V13.2.0 or later) – Mobile Equipment (ME) conformance test specification; Universal Subscriber Identity Module Application Toolkit (USAT)

Ref	Title
	conformance test specification
[22]	ETSI TS 102 223 (V9.4.0 or later) – Smart Cards;Card Application Toolkit (CAT)
[23]	ETSI TS 102 226 (V9.6.0 or later) – Smart Cards ;Remote APDU structure for UICC based applications
[24]	ETSI TS 102 127 (V6.13.0 or later) – Smart Cards; Transport protocol for CAT applications; Stage 2
[25]	3GPP TS 34.108 (V12.1.0 or later) – Common test environments for User Equipment (UE); Conformance testing
[26]	GCF WI – 190 – SWP/HCI Enhancements for UICC Based NFC Services
[27]	GlobalPlatform – SEAC DeviceSide Test Plan v1.0.6
[28]	ISO/IEC 18092:2013 Information technology -- Telecommunications and information exchange between systems -- Near Field Communication -- Interface and Protocol (NFCIP-1)
[29]	X.509 Certificate is published as ITU recommendation ITU-T X.509 (formerly CCITT X.509) and ISO/IEC/ITU 9594-8. It defines a standard certificate format for public key certificates and certification validation.
[30]	NFC Forum Test Cases For Type 1 Tag Operation v1.1.01 (or later)
[31]	NFC Forum Test Cases For Type 2 Tag Operation v1.1.01 (or later)
[32]	NFC Forum Test Cases For Type 3 Tag Operation v1.1.01 (or later)
[33]	NFC Forum Test Cases For Type 4 Tag Operation v1.00.05 (or later)
[34]	3GPP TS 31.116 (Release V9.4.0 or later) Remote APDU (Application Protocol Data Unit) Structure for (Universal) Subscriber Identity Module (U)SIM Toolkit applications
[35]	ISO/IEC 7816-3: 2006 or later "Identification cards - Integrated circuit cards - Part 3: Cards with contacts - Electrical interface and transmission protocols".
[36]	3GPP TS 36.508 (V12.6.0 or later) – LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing
[37]	NFC Forum Test Cases for Analog v1.0.04 (or later)
[38]	EMV Contactless Communication Protocol Specification, Book D, Version 2.5 (or later)
[39]	EMV Mobile Product Level 1 Type Approval, Interoperability Testing Requirements, Version 1.0 (or later)

1.6 Conventions

As per IETF Requirements terminology, reference RFC 2119, the following terms have the following meaning.

Term	Description
SHALL	Denotes a mandatory requirement
SHOULD	Denotes a recommendation
MAY	Denotes Optional

2 Test environment

2.1 Applicability

The purpose of this section is to confirm whether a test case as defined in the TS.27 is applicable.

For test cases defined in referenced specifications, the corresponding applicability is defined in the referenced specifications.

The applicability depends on the features supported in the device and/or on the Operating System.

This section consists of 6 tables which are the normative tables:

Table 4, 5 and 6a are to be completed by device supplier and test house respectively:

- Table 4: "Optional features": This is a template with features (device characteristics) optional for the device to support. This table should be completed by the supplier of the device. The completed template can be input for the compilation of list of applicable test cases from table 5.
- Table 5: "Applicability Table": This is a template which can be used to establish the list of applicable test cases depending on the supported features and the Operating System. The table provide a "Support" Column which should be used to state the established applicability complied from the conditional expressions.
- Table 6a: "Device default configuration". Additional device information used for the testing.

Table 1, 2, 3 and 6, explain the format and content of Table 4 and 5.

- Table 1, 2 and 3: These tables explain the columns, the format and status notifications used in Table 4 and 5.
- Table 6: "Conditional Items": This is a list of conditional (Boolean) expressions to be evaluated by the test house. The expressions are evaluated based on Table 4 Optional Features and used to establish the complete list of applicable test cases for the device to be tested.

The format and usage of applicability definition follow the description within ETSI specifications e.g. ETSI TS 102 694-1 [11], but simplified to only cover the scope of TS.27.

2.1.1 Format of the table of optional features

The columns in table of optional features have the following meaning:

Column	Meaning
Item	Unique numbering of each optional feature
Optional Feature	The name of the optional feature supported or not supported by the device implementation.

Column	Meaning
Support	The support columns are to be filled in by the supplier of the device. The following common notations can be used: Y The feature is supported by the device. N The feature is not supported by the device.
Mnemonic	The mnemonic column contains mnemonic identifiers for each item which is a short name for the optional feature.

Table 1: Format of the table of optional features

2.1.2 Format of the applicability table

The format of the Applicability table is defined in the table below.

The columns in Table 5 have the following meaning:

Column	Meaning
Test case	The “Test case” column gives a unique reference to the test case.
Test Case Title	The “Test Case Title” column gives the title of the test case.
TS.26 Versions	The "TS.26 versions" column gives the item in the "Test Case title" column the applicable requirements version: - *Version x.y* “onwards”: if the requirement is applicable from this TS.26 version and for the later versions “Up to” *Version x.y:* if the requirement is applicable until this TS.26 version and it has been changed or replaced for the later TS.26 versions
Test case applicability	The “Test case applicability” column indicates which test cases are applicable per given Device Operating System. Several different status notifications can be used in this column. They are defined in the table in section 2.1.3.
Applicable	This column can be used to state the final applicability for each test case derived from the conditional expressions. Completion of this column shall be either “Yes” or “No”.

Table 2: Format of the applicability table

The Applicability Table does not include test cases in the status FFS. The FFS test cases are only included in the complete list of test cases in Annex D.1.

2.1.3 Status and Notations of the Applicability Table

The “Device Operating System” columns show the status of the entries as follows:

The following notations are used for the status column:

Status	Description
M	Mandatory – the test case is mandatory for a device implementation using the given Operating System. If the test case refers to an external specification, there might be several additional test cases required. This means the specific applicability of each underlying test cases has to be evaluated according to the applicability within the external specification. For example if an “M” is stated in the TS.27, it does not necessarily mean that all the underlying test cases are applicable.
FFS	See section 2.2.4
N/A	Not Applicable – the test case is not applicable for a device using the given Operating System, i.e. the test is not required. N/A is considered as a permanent “Not Applicable” test case compared to TNR, see below.
TNR	Test Not Ready – the test case is not available in this version of TS.27 for a device using the given Operating System. This means in a future version of TS.27, the test case is expected to be updated to support the specific Operating System or a new test case will be defined.
Ci	Conditional – the requirement on the capability (“M”, “O” or “N/A”) depends on the support of other optional or conditional items. “i” is an integer identifying an unique conditional status expression which is defined immediately following the table. For nested conditional expressions, the syntax "IF ... THEN (IF ... THEN ... ELSE...) ELSE … " is to be used to avoid ambiguities.

Table 3: Status and Notations

2.1.4 Table of optional features

The supplier of the implementation shall state the support of possible options in Table 4. See clause 2.1.1 for the format of Table 4. Items indicated as O_XYZ (for example, O_SCWS) refer to features supported by the device.

Item	Optional Feature	Support	Mnemonic (short name for the optional feature)
1	VOID		
2	Support of LTE/IMS		O_LTE/IMS
3	Support of LTE with fallback to 2G/3G		O_LTE/2G-3G
4	Support of read/write NFC Tag at distance > 1,0cm and ≤ 2,0cm		O_TAG_DISTANCE 2CM
5	Support of read/write NFC Tag at distance > 2,0cm and ⩽ 3,0cm, see note 5		O_TAG_DISTANCE_3CM

Item	Optional Feature	Support	Mnemonic (short name for the optional feature)
6	Support of read/write NFC Tag at distance > 3,0cm and ≤ 4,0cm, see note 4		O_TAG_DISTANCE_4CM
7	Support of battery low mode, see note 2		O_BAT_LOW
8	Support of battery off mode, see notes 2 and 3		O_BAT_OFF
9	Support of multiple SE		O_MUL_SE
10	Support of Multiple APN		O_MULTI_APN
11	Terminal executes User confirmation phase before sending PDP context activation request		O_User_Confirm_Before_PDP_Context_Request
12	Support of Multiple Active CEEs model in Battery Operational Mode		O_MULTI_CEE_ON
13	Support of Single Active Card Emulation Environment in Battery Operational Mode		O_Single_Active_CEE
14	Default route selection user menu is provided by the DUT		O_DEFAULT_ROUTE_SELECTION_BY_USER_MENU
15	The NFC status is persistent across DUT power off and power on		O_NFC _PERSISTENCE
16	DUT supports API to select and switch the Active CEE (see note 6)		O_API_SWITCH_CEE
17	Support of Card Emulation for FeliCa on UICC (see note 7)		O_CARD_EM_FELICA_UICC
18	Support of MIFARE Classic Reader/Writer		O_MIFARE_CLASSIC_RW
19	Support of MIFARE DESFire Reader/Writer		O_MIFARE_DESFIRE_RW
20	Terminal supports Short Message Service (SMS) MT over CS (see note 8 and 10)		pc_SMS_CS_MT
21	Terminal supports Short Message Service (SMS) MO over CS (see note 9 and 10)		pc_SMS_CS_MO
22	Terminal supports Short Message Service (SMS) MT over PS (see note 8 and 10)		pc_SMS_PS_MT

Item	Optional Feature	Support	Mnemonic (short name for the optional feature)
23	Terminal supports Short Message Service (SMS) MO over PS (see note 9 and 10)		pc_SMS_PS_MO
24	Preferred buffer size supported by the terminal for Open Channel command is greater than 0 byte and less than 65535 bytes		O_BUFFER_SIZE
25	VOID		
26	Support of REQ_143 (see Note 11)		O_REQ_143
27	DUT implements Android versions before OS 6.0 Marshmallow (Marshmallow is not included)		O_BEFORE_ANDROID_MARSHMALLOW
28	Support of complete functionality of the GSMA Android NFC API as defined in TS.26 v8.0 or later (see note 12)		O_ANDROID_API_V8_OR_LATER

Note 1: In order to reflect current industry implementation, test cases with read/write distance > 1cm are optional for this version

Note 2: For options O_BAT_LOW and O_BAT_OFF the DUT shall support at least one of these options or both.

Note 3: If the device supports O_BAT_OFF, the device manufacturer must supply details of how to enter this state

Note 4: If option O_TAG_DISTANCE_4CM is supported, then O_TAG_DISTANCE_2CM and O_TAG_DISTANCE_3CM must be supported.

Note 5: If option O_TAG_DISTANCE_3CM is supported, then O_TAG_DISTANCE_2CM must be supported

Note 6: For Android, if the device supports O_Single_Active_CEE, then O_API_SWITCH_CEE must be supported.

Note 7: As per TS26_NFC_REQ_009, TS26_NFC_REQ_009.1, TS26_NFC_REQ_025 and TS26_NFC_REQ_025.1: O_CARD_EM_FELICA_UICC is optional until 31st July 2015; from 1st August 2015, it is mandatory.

Note 8: IF pc_SMS_PS_MT is supported, then pc_SMS_CS_MT is optional, else pc_SMS_CS_MT is mandatory

Note 9: IF pc_SMS_PS_MO is supported, then pc_SMS_CS_MO is optional, else pc_SMS_CS_MO is mandatory

Note 10: The options pc_SMS_CS_MT, pc_SMS_CS_MO, pc_SMS_PS_MT and pc_SMS_PS_MO are related to the testcases in Chapter 12.3.3.9.

Note 11: O_REQ_143 is used in section 2.6.1. For devices supporting TS.26 v8.0 or later and O_MULTI_CEE_ON, it is mandatory that the device supports this option, as O_REQ_143 is mandatory from TS.26 v8.0. For devices supporting versions of TS.26 before v8.0, support of O_REQ_143 is optional.

Note 12: O_ANDROID_API_V8_OR_LATER is used in test cases in section 15. For devices supporting TS.26 v8.0 or later, support of O_ANDROID_API_V8_OR_LATER is mandatory. For

Item	Optional Feature	Support	Mnemonic (short name for the optional feature)
devices supporting versions of TS.26 before v8.0, support of O_ANDROID_API_V8_OR_LATER is optional. If a device indicates support of the GSMA Android NFC API as defined in a particular verison of TS.26, it shall support the complete functionality of the API as defined in that version. Note 13:VOID.			

Table 4: Options

2.1.5 Applicability Table

The table below specifies the applicability of each test case to the device under test. See clause 2.1.2 for the format of Table.

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.3.3.1	NFC Forum Type 1 Tag – Read NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.2	NFC Forum Type 2 Tag – Read NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.3	NFC Forum Type 3 Tag – Read NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.4	NFC Forum Type 4 Tag – Read NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.5.1	NFC Forum Type 1 Tag – Write NFC Tag – Test Sequence No 1	5.0 onwards	M	M	M	FFS	
3.3.3.5.2	NFC Forum Type 1 Tag – Write NFC Tag – Test Sequence No 2	5.0 onwards	FFS	FFS	FFS	FFS	
3.3.3.6	NFC Forum Type 2 Tag – Write NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.7	NFC Forum Type 3 Tag – Write NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.8	NFC Forum Type 4 Tag – Write NFC Tag	5.0 onwards	M	M	M	FFS	
3.3.3.9.1	Distance for NFC Type 1 Tag reading Test Sequence No 1: Distance for NFC Type 1 Tag Reading – 0,0cm	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.3.3.9.2	Distance for NFC Type 1 Tag reading Test Sequence No 2: Distance for NFC Type 1 Tag Reading – 0,5cm	5.0 onwards	M	M	M	FFS	
3.3.3.9.3	Distance for NFC Type 1 Tag reading Test Sequence No 3: Distance for NFC Type 1 Tag reading – 1,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.9.4	Distance for NFC Type 1 Tag reading Test Sequence No 4: Distance for NFC Type 1 Tag Reading – 2,0cm	5.0 onwards	C015	C015	C015	FFS	
3.3.3.9.5	Distance for NFC Type 1 Tag reading Test Sequence No 5: Distance for NFC Type 1 Tag Reading – 3,0cm	6.0 onwards	C016	C016	C016	FFS	
3.3.3.9.6	Distance for NFC Type 1 Tag reading Test Sequence No 6: Distance for NFC Type 1 Tag Reading – 4,0cm	6.0 onwards	C017	C017	C017	FFS	
3.3.3.10.1	Distance for NFC Type 2 Tag reading Test Sequence No 1: Distance for NFC Type 2 Tag Reading – 0,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.10.2	Distance for NFC Type 2 Tag reading Test Sequence No 2: Distance for NFC Type 2 Tag Reading – 0,5cm	5.0 onwards	M	M	M	FFS	
3.3.3.10.3	Distance for NFC Type 2 Tag reading Test Sequence No 3: Distance for NFC Type 2 Tag reading – 1,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.10.4	Distance for NFC Type 2 Tag reading Test Sequence No 4: Distance for NFC Type 2 Tag Reading – 2,0cm	5.0 onwards	C015	C015	C015	FFS	
3.3.3.10.5	Distance for NFC Type 2 Tag reading Test Sequence No 5: Distance for NFC Type 2 Tag Reading – 3,0cm	6.0 onwards	C016	C016	C016	FFS	
3.3.3.10.6	Distance for NFC Type 2 Tag reading Test Sequence No 6: Distance for NFC Type 2 Tag Reading – 4,0cm	6.0 onwards	C017	C017	C017	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.3.3.11.1	Distance for NFC Type 3 Tag reading Test Sequence No 1: Distance for NFC Type 3 Tag Reading – 0,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.11.2	Distance for NFC Type 3 Tag reading Test Sequence No 2: Distance for NFC Type 3 Tag Reading – 0,5cm	5.0 onwards	M	M	M	FFS	
3.3.3.11.3	Distance for NFC Type 3 Tag reading Test Sequence No 3: Distance for NFC Type 3 Tag reading – 1,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.11.4	Distance for NFC Type 3 Tag reading Test Sequence No 4: Distance for NFC Type 3 Tag Reading – 2,0cm	5.0 onwards	C015	C015	C015	FFS	
3.3.3.11.5	Distance for NFC Type 3 Tag reading Test Sequence No 5: Distance for NFC Type 3 Tag Reading – 3,0cm	6.0 onwards	C016	C016	C016	FFS	
3.3.3.11.6	Distance for NFC Type 3 Tag reading Test Sequence No 6: Distance for NFC Type 3 Tag Reading – 4,0cm	6.0 onwards	C017	C017	C017	FFS	
3.3.3.12.1	Distance for NFC Type 4A Tag reading Test Sequence No 1: Distance for NFC Type 4 TagA Reading – 0,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.12.2	Distance for NFC Type 4A Tag reading Test Sequence No 2: Distance for NFC Type 4 TagA Reading – 0,5cm	5.0 onwards	M	M	M	FFS	
3.3.3.12.3	Distance for NFC Type 4A Tag reading Test Sequence No 3: Distance for NFC Type 4 TagA reading – 1,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.12.4	Distance for NFC Type 4A Tag reading Test Sequence No 4: Distance for NFC Type 4 TagA Reading – 2,0cm	5.0 onwards	C015	C015	C015	FFS	
3.3.3.12.5	Distance for NFC Type 4A Tag reading Test Sequence No 5: Distance for NFC Type 4 TagA Reading – 3,0cm	6.0 onwards	C016	C016	C016	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.3.3.12.6	Distance for NFC Type 4A Tag reading Test Sequence No 6: Distance for NFC Type 4 TagA Reading – 4,0cm	6.0 onwards	C017	C017	C017	FFS	
3.3.3.13.1	Distance for NFC Type 4B Tag reading Test Sequence No 1: Distance for NFC Type 4 TagB Reading – 0,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.13.2	Distance for NFC Type 4B Tag reading Test Sequence No 2: Distance for NFC Type 4 TagB Reading – 0,5cm	5.0 onwards	M	M	M	FFS	
3.3.3.13.3	Distance for NFC Type 4B Tag reading Test Sequence No 3: Distance for NFC Type 4 TagB reading – 1,0cm	5.0 onwards	M	M	M	FFS	
3.3.3.13.4	Distance for NFC Type 4B Tag reading Test Sequence No 4: Distance for NFC Type 4 TagB Reading – 2,0cm	5.0 onwards	C015	C015	C015	FFS	
3.3.3.13.5	Distance for NFC Type 4B Tag reading Test Sequence No 5: Distance for NFC Type 4 TagB Reading – 3,0cm	6.0 onwards	C016	C016	C016	FFS	
3.3.3.13.6	Distance for NFC Type 4B Tag reading Test Sequence No 5: Distance for NFC Type 4 TagB Reading – 4,0cm	6.0 onwards	C017	C017	C017	FFS	
3.3.3.14	NFC Type 1 Tag reading performance	5.0 onwards	M	M	M	FFS	
3.3.3.15	NFC Type 2 Tag reading performance	5.0 onwards	M	M	M	FFS	
3.3.3.16	NFC Type 3 Tag reading performance	5.0 onwards	M	M	M	FFS	
3.3.3.17	NFC Type 4A Tag reading performance	5.0 onwards	M	M	M	FFS	
3.3.3.18	NFC Type 4B Tag reading performance	5.0 onwards	M	M	M	FFS	
3.3.3.19	NFC Tag handling during an active data transfer.	5.0 onwards	M	M	M	FFS	
3.3.3.24	NFC Forum Tag Operations Test Cases	6.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.3.3.25	NFC Forum Test Cases for Analog	8.0 onwards	M	M	M	FFS	
3.4.3.1.1	Card Emulation enabled as soon as NFC hardware is on Test Sequence No.1	5.0 onwards	M	M	M	FFS	
3.4.3.1.2	Card Emulation enabled as soon as NFC hardware is on Test sequence No 2	5.0 onwards	C014	C014	C014	FFS	
3.4.3.2	NFC during Standby time	5.0 onwards	C005	C005	C005	FFS	
3.4.3.3.1	Verify that device is able to perform Card Emulation Mode A, Card Emulation Mode B and CLT A transaction either in Battery Power Off or Battery Low modes Test sequence No 1: Card Emulation Mode Type A in Battery Power Off mode	5.0 onwards	C006	C006	C006	FFS	
3.4.3.3.2	Verify that device is able to perform Card Emulation Mode A, Card Emulation Mode B and CLT A transaction either in Battery Power Off or Battery Low modes Test sequence No 2: Card Emulation Mode Type B in Battery Power Off mode	5.0 onwards	C006	C006	C006	FFS	
3.4.3.3.4	Verify that device is able to perform Card Emulation Mode A, Card Emulation Mode B and CLT A transaction either in Battery Power Off or Battery Low modes Test sequence No 4: Card Emulation Mode Type A in Battery Low Mode	5.0 onwards	C005	C005	C005	FFS	
3.4.3.3.5	Verify that device is able to perform Card Emulation Mode A, Card Emulation Mode B and CLT A transaction either in Battery Power Off or Battery Low modes Test sequence No 5: Card Emulation Mode Type B in Battery Low Mode	5.0 onwards	C005	C005	C005	FFS	
3.4.3.4	Distance for card emulation	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.4.3.5	Distance for card emulation in Battery Power-off Mode (0cm)	5.0 onwards	C006	C006	C006	FFS	
3.4.3.6	Distance for card emulation in Battery Power-off Mode (0.5cm)	5.0 onwards	C006	C006	C006	FFS	
3.4.3.7	Distance for card emulation in Battery Power-off Mode (1cm)	5.0 onwards	C006	C006	C006	FFS	
3.4.3.8	Distance for card emulation in Battery Power-off Mode (1.5cm)	5.0 onwards	C006	C006	C006	FFS	
3.4.3.9	Distance for card emulation in Battery Power-off Mode (2cm)	5.0 onwards	C006	C006	C006	FFS	
3.4.3.10	Distance for card emulation in Battery Power-low Mode (0cm)	5.0 onwards	C005	C005	C005	FFS	
3.4.3.11	Distance for card emulation in Battery Power-low Mode (0.5cm)	5.0 onwards	C005	C005	C005	FFS	
3.4.3.12	Distance for card emulation in Battery Power-low Mode (1cm)	5.0 onwards	C005	C005	C005	FFS	
3.4.3.13	Distance for card emulation in Battery Power-low Mode (1.5cm)	5.0 onwards	C005	C005	C005	FFS	
3.4.3.14	Distance for card emulation in Battery Power-low Mode (2cm)	5.0 onwards	C005	C005	C005	FFS	
3.4.3.15	Distance for card emulation in Battery Power-operational Mode (0cm)	5.0 onwards	M	M	M	FFS	
3.4.3.16	Distance for card emulation in Battery Power-operational Mode (0.5cm)	5.0 onwards	M	M	M	FFS	
3.4.3.17	Distance for card emulation in Battery Power-operational Mode (1cm)	5.0 onwards	M	M	M	FFS	
3.4.3.18	Distance for card emulation in Battery Power-operational Mode (1.5cm)	5.0 onwards	M	M	M	FFS	
3.4.3.19	Distance for card emulation in Battery Power-operational Mode (2cm)	5.0 onwards	M	M	M	FFS	
3.5.3.1	SWP Compliance testing	5.0 onwards	M	M	M	FFS	
3.5.3.2	HCI Compliance testing	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
3.5.3.3	SWP Stress test	5.0 onwards	M	M	M	FFS	
3.5.3.4	Switch mode	5.0 onwards	M	M	M	FFS	
3.5.3.5	RF Protocol compliance	5.0 onwards	M	M	M	FFS	
5.3.1	GP SE Access Control	5.0 onwards	M	TNR	TNR	FFS	
5.3.2	GP SE Access Control - Refresh tag	5.0 onwards	M	TNR	TNR	FFS	
5.3.3	GP SE Access Control – ADF_PKCS#15 and DF PKCS#15	5.0 onwards	M	TNR	TNR	FFS	
5.3.4	GP SE Access Control – PKCS#15 selection via EF_DIR	5.0 onwards	M	TNR	TNR	FFS	
5.3.5	GP SE Access Control – Configuration limits	5.0 onwards	M	TNR	TNR	FFS	
5.3.6	GP SE Access Control – No access	5.0 onwards	M	TNR	TNR	FFS	
5.4	GP SE Access Control – GP Test Plan See Note 1 at the end of the table.	5.0 onwards	M	TNR	TNR	FFS	
6.3.1	SIMalliance APIs	See Annex B.1	M	N/A	FFS	FFS	
7.3.2	SE selection	5.0 onwards	C007	C007	C007	FFS	
7.3.6	Switch for Card Emulation Mode	6.0 onwards	C012	TNR	TNR	FFS	
7.3.7.1	Multiple CE Environments Test Sequence No 1: Default route UICC, contactless session with unregistered AID	6.0 onwards	C019	N/A	N/A	FFS	
7.3.7.2	Multiple CE Environments Test Sequence No 2: Default route HCE, contactless session with unregistered AID	6.0 onwards	C018	N/A	N/A	FFS	
7.3.7.3	Multiple CE Environments Test Sequence No 3: Default route UICC, off-host AID	6.0 onwards	C019	N/A	N/A	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
7.3.7.4	Multiple CE Environments Test Sequence No 4: Default route HCE, off-host AID	6.0 onwards	C018	N/A	N/A	FFS	
7.3.7.5	Multiple CE Environments Test Sequence No 5: Default route UICC, AID conflict, off-host service selected	6.0 onwards	C019	N/A	N/A	FFS	
7.3.7.6	Multiple CE Environments Test Sequence No 6: Default route HCE, AID conflict, off-host service selected	6.0 onwards	C018	N/A	N/A	FFS	
7.3.7.7	Multiple CE Environments Test Sequence No 7: Default route UICC, off-host service selected in Tap&Pay	6.0 onwards	C019	N/A	N/A	FFS	
7.3.7.8	Multiple CE Environments Test Sequence No 8: Default route HCE, off-host service selected in Tap&Pay	6.0 onwards	C018	N/A	N/A	FFS	
7.3.7.9	Multiple CE Environments Test Sequence No 9: Default route UICC, HCE service selected in Tap&Pay	6.0 onwards	C019	N/A	N/A	FFS	
7.3.7.10	Multiple CE Environments Test Sequence No 10: Default route HCE, HCE service selected in Tap&Pay	6.0 onwards	C018	N/A	N/A	FFS	
7.3.8.2	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 2: REQ_065 for NFCA	6.0 onwards	C019	C019	C019	FFS	
7.3.8.3	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 3: REQ_118.2 for NFCA	6.0 onwards	C019	C019	C019	FFS	
7.3.8.4	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 4: REQ_118.2 for NFCB	6.0 onwards	C019	C019	C019	FFS	
7.3.8.5	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 5: REQ_118.1 and REQ_162.1 for NFCA	6.0 onwards	C019	C019	C019	FFS	
7.3.8.6	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 6: REQ_065 for NFCB	6.0 onwards	C019	C019	C019	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
7.3.8.9	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 9: REQ_118.2 and REQ_162.1 for NFCA	9.0 onwards	C019	C019	C019	FFS	
7.3.8.10	Active Card Emulation in Multiple CE Environments / Card Emulation Sequence No 10: REQ_118.2 and REQ_162.1 for NFCB	9.0 onwards	C019	C019	C019	FFS	
8.3.1	EVT_TRANSACTION	5.0 onwards	M	M	M	FFS	
8.3.2	Permissions	5.0 onwards	C022	N/A	N/A	FFS	
8.3.3	Intent management	5.0 onwards	M	N/A	N/A	FFS	
8.3.4	Application's triggering order	5.0 onwards	M	N/A	N/A	FFS	
8.3.5	Triggering on HCI event EVT_CARD_DEACTIVATED	5.0 onwards	M	TNR	TNR	FFS	
8.3.6	Triggering on HCI event EVT_FIELD_OFF	5.0 onwards	M	TNR	TNR	FFS	
11.3.1.1	OPEN CHANNEL Test Sequence 1: (OPEN CHANNEL – Default APN Always-ON – Multiple APN supported – with different APN)	5.0 onwards	C008	C008	C008	FFS	
11.3.1.2	OPEN CHANNEL 11.3.1.2 Test Sequence 2: (OPEN CHANNEL – Default APN Always-ON – Only Single APN supported – with different APN)	5.0 onwards	C009	C009	C009	FFS	
11.3.1.3	OPEN CHANNEL Test Sequence 3: (OPEN CHANNEL – Default APN Always-ON – APN empty)	5.0 onwards	M	M	M	FFS	
11.3.1.4	OPEN CHANNEL Test Sequence No 4: (OPEN CHANNEL – Default APN Always-ON – APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
11.3.2.1	CLOSE CHANNEL Test Sequence 1: (CLOSE CHANNEL – Default APN Always-ON – Multiple APN supported – with different APN-SUCCESSFUL)	5.0 onwards	C008	C008	C008	FFS	
11.3.2.2	CLOSE CHANNEL Test Sequence 2: (CLOSE CHANNEL – Default APN Always-ON – Only Single APN supported – with different APN-SUCCESSFUL)	5.0 onwards	C009	C009	C009	FFS	
11.3.2.3	CLOSE CHANNEL Test Sequence 3: (CLOSE CHANNEL – Default APN Always-ON – APN empty-SUCCESSFUL)	5.0 onwards	M	M	M	FFS	
11.3.2.4	CLOSE CHANNEL Test Sequence No 4: (CLOSE CHANNEL – Default APN Always-ON – APN empty-SUCCESSFUL- Default Bearer Type Used)	5.0 onwards	M	M	M	FFS	
11.3.3.1	RECEIVE DATA Test Sequence 1: (RECEIVE DATA – Default APN Always-ON – Multiple APN supported – with different APN)	5.0 onwards	C008	C008	C008	FFS	
11.3.3.2	RECEIVE DATA Test Sequence 2: (RECEIVE DATA – Default APN Always-ON – Only Single APN supported – with different APN)	5.0 onwards	C009	C009	C009	FFS	
11.3.3.3	RECEIVE DATA Test Sequence 3: (RECEIVE DATA – Default APN Always-ON – APN empty)	5.0 onwards	M	M	M	FFS	
11.3.3.4	RECEIVE DATA Test Sequence 4: (RECEIVE DATA –Default APN Always-ON – APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
11.3.4.1	SEND DATA Test Sequence 1: (SEND DATA – Default APN Always-ON – Multiple APN supported – with different APN- BUFFER FULLY USED)	5.0 onwards	C008	C008	C008	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
11.3.4.2	SEND DATA Test Sequence 2: (SEND DATA – Default APN Always-ON – Only Single APN supported – with different APN- BUFFER FULLY USED)	5.0 onwards	C009	C009	C009	FFS	
11.3.4.3	SEND DATA Test Sequence 3: (SEND DATA – Default APN Always-ON – APN empty- BUFFER FULLY USED)	5.0 onwards	M	M	M	FFS	
11.3.4.4	SEND DATA Test Sequence 4: (SEND DATA – Default APN Always-ON – APN empty- BUFFER FULLY USED- Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.3.3.1	Remote management in BIP	5.0 onwards	M	M	M	FFS	
12.3.3.2.1	OPEN CHANNEL Test Sequence No 1: (OPEN CHANNEL, No APN, immediate link establishment, Default Bearer for requested transport layer, No local address, no alpha identifier)	5.0 onwards	M	M	M	FFS	
12.3.3.2.2	OPEN CHANNEL Test sequence No 2: (OPEN CHANNEL, with APN, immediate link establishment, Default Bearer for requested transport layer, no alpha identifier)	5.0 onwards	M	M	M	FFS	
12.3.3.2.3	OPEN CHANNEL Test Sequence No 3: (OPEN CHANNEL, with alpha identifier, immediate link establishment, Default Bearer for requested transport layer)	5.0 onwards	M	M	M	FFS	
12.3.3.2.4	OPEN CHANNEL Test Sequence No 4: (OPEN CHANNEL, with null alpha identifier, immediate link establishment, Default Bearer for requested transport layer)	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
12.3.3.2.5	OPEN CHANNEL Test Sequence No 5: (OPEN CHANNEL, command performed with modifications (buffer size), immediate link establishment, Default Bearer for requested transport layer)	5.0 onwards	C20	C20	C20	FFS	
12.3.3.2.6	OPEN CHANNEL Test Sequence No 6A: (OPEN CHANNEL, user rejection, immediate link establishment, Default Bearer for requested transport layer, open command with alpha identifier,)	5.0 onwards	C010	C010	C010	FFS	
12.3.3.2.7	OPEN CHANNEL Test Sequence No 6B: (OPEN CHANNEL, User rejection, immediate link establishment, Default Bearer for requested transport layer, open command with alpha identifier)	5.0 onwards	C011	C011	C011	FFS	
12.3.3.3	CLOSE CHANNEL	5.0 onwards	M	M	M	FFS	
12.3.3.4	RECEIVE DATA	5.0 onwards	M	M	M	FFS	
12.3.3.5	SEND DATA	5.0 onwards	M	M	M	FFS	
12.3.3.6	GET CHANNEL STATUS	5.0 onwards	M	M	M	FFS	
12.3.3.7	Data available event	5.0 onwards	M	M	M	FFS	
12.3.3.8	Channel Status event	5.0 onwards	M	M	M	FFS	
12.3.3.9.1	SMS-PP Data Download Test Sequence No 1: (SMS-PP – followed by Open channel – Send/Receive data)	6.0 onwards	M	M	M	FFS	
12.3.3.9.2	SMS-PP Data Download Test Sequence No 2: (SMS-PP – Send SM – followed by Open channel – Send/Receive data)	6.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
12.3.3.9.3	SMS-PP Data Download Test Sequence No 3: (SMS-PP – Send SM – followed by Open channel – Send/Receive data with timer management)	6.0 onwards	M	M	M	FFS	
12.3.3.9.5	Test Sequence No 4: (SMS-PP - Open channel - Send/Receive data - Send SM with More Time)	9.0 onwards	M	M	M	FFS	
12.3.3.9.6	Test Sequence No 5: (SMS-PP - Open channel - Send/Receive data - Send SM without More Time)	9.0 onwards	M	M	M	FFS	
12.3.3.10	Concurrent BIP channels	5.0 onwards	M	M	M	FFS	
12.3.3.11	Contents of the TERMINAL PROFILE	5.0 onwards	M	M	M	FFS	
12.3.3.12.1	OPEN CHANNEL – Terminal connected to Wi-Fi Test Sequence No 1: (OPEN CHANNEL, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.3.3.12.2	OPEN CHANNEL – Terminal connected to Wi-Fi Test Sequence No 2: (OPEN CHANNEL, Terminal connected to Wi-Fi-APN empty-GPRS Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.3.3.13.1	CLOSE CHANNEL – Terminal connected to Wi-Fi Test Sequence No 1: (CLOSE CHANNEL, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.3.3.13.2	CLOSE CHANNEL – Terminal connected to Wi-Fi Test Sequence No 2: (CLOSE CHANNEL, Terminal connected to Wi-Fi-APN empty-GPRS Bearer Type used)	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
12.3.3.14	RECEIVE DATA – Terminal connected to Wi-Fi Test Sequence No 1: (RECEIVE DATA, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.3.3.15	SEND DATA – Terminal connected to Wi-Fi Test Sequence No 1: (SEND DATA, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)	5.0 onwards	M	M	M	FFS	
12.4.3.1	Contactless transaction during BIP session	5.0 onwards	M	M	M	FFS	
12.4.3.2.1	Receiving and accepting a voice call during BIP CAT-TP data transfer	5.0 onwards	M	M	M	FFS	
12.4.3.2.3	Voice Call made from the device during BIP CAT-TP session	5.0 onwards	M	M	M	FFS	
12.4.3.2.5	BIP CAT-TP data transfer during a Voice Call is established	5.0 onwards	M	M	M	FFS	
12.4.3.3.1	Test Sequence No 1: OTA data Loading without PoR requested by OTA server	5.0 onwards	M	M	M	FFS	
12.4.3.3.2	Test Sequence No 2: OTA data Loading with PoR requested by OTA server	5.0 onwards	M	M	M	FFS	
12.4.3.3.3	Test Sequence No 3: OTA data Loading with PoR requested by OTA server when the device is booting	5.0 onwards	M	M	M	FFS	
12.4.3.3.4	Test Sequence No 4: OTA data Loading with PoR requested by OTA server after the device comes back from airplane mode.	5.0 onwards	M	M	M	FFS	
12.4.3.3.5	Test Sequence No 5: OTA data Loading with PoR requested by OTA server only on error	5.0 onwards	M	M	M	FFS	
12.4.3.4	Secure Element Access during BIP session	5.0 onwards	M	M	M	FFS	
12.4.3.5.	SMS and Internet Connection during OTA data Loading	5.0 onwards	M	M	M	FFS	
12.4.3.6	OTA Loading of a Cardlet on SYN retry (simulate loss of PDUs)	5.0 onwards	M	M	M	FFS	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
12.4.3.7	Link Establishment using Push SMS	6.0 onwards	M	M	M	FFS	
13.3.1	Secure Element Access API in Radio Off State	5.0 onwards	M	TNR	TNR	FFS	
13.3.2	Enabled / Disabled states	5.0 onwards	M	M	M	FFS	
13.3.3	Modem and UICC over APDU exchange	5.0 onwards	M	TNR	TNR	FFS	
13.3.4	Modem retrieves the response data to the SELECT command	8.0 onwards	M	TNR	TNR	FFS	
13.3.5	Modem supports 19 logical channels	8.0 onwards	M	TNR	TNR	FFS	
13.3.6	Long APDU handling	9.0 onwards	M	M	M	FFS	
13.3.7	Terminal Capability TAG 82	9.0 onwards	M	M	M	FFS	
15.3.3.1	Shared library	6.0 onwards	M	N/A	N/A	N/A	
15.3.3.2	Getting an instance of the “NFC controller” class	5.0 onwards	M	N/A	N/A	N/A	
15.3.3.3	Getting the status of the NFC Controller	5.0 onwards	M	N/A	N/A	N/A	
15.3.3.4	Enabling the NFC Controller	6.0 onwards	M	N/A	N/A	N/A	
15.4.3.1	Open Mobile Service layer API	6.0 onwards	M	N/A	N/A	N/A	
15.4.3.2	SIMAlliance OMAPI & GP access Control just after device boot	6.0 onwards	M	N/A	N/A	N/A	
15.4.3.3	Getting the list of available Secure Elements	8.0 onwards	M	N/A	N/A	N/A	
15.4.3.4	Identical SE Names across GSMA APIs	8.0 onwards	C018	N/A	N/A	N/A	
15.5.3.1	Switching to “Multicast” Mode	6.0 onwards	M	N/A	N/A	N/A	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
15.5.3.2	Receiving EVT Transaction from “BroadcastReceiver”	6.0 onwards	M	N/A	N/A	N/A	
15.5.3.3	Checking EVT Transaction data sent through “BroadcastReceiver”	6.0 onwards	M	N/A	N/A	N/A	
15.5.3.4	Test EVT Transaction event shall be handled only by the appropriate application	5.0 onwards	M	N/A	N/A	N/A	
15.5.3.5	Application Permission for Open Mobile API	6.0 onwards	M	N/A	N/A	N/A	
15.5.3.6	EVT Transaction is received only by the appropriate application based on priority scheme	8.0 onwards	M	N/A	N/A	N/A	
15.7.3.1	Dynamic AIDs Registration APIs – “com.gsma.services.nfc.NfcController” class	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.2	Dynamic AIDs Registration APIs – “com.gsma.services.nfc.OffHostService” class	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.3	Dynamic AIDs Registration APIs – “com.gsma.services.nfc.AidGroup” class	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.4	“Long press” on “Tap&Pay” menu entries	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.5	Routing in Multiple CEE model	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.6	AID Conflict Resolution mechanism	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.7.1	Test Sequence No 1 : Application uninstalled	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.7.2	Test Sequence No 2 : Application disabled and re-enabled	9.0 onwards	C018	N/A	N/A	N/A	
15.7.3.8	Routing update when Application is updated / upgraded in Multiple CEE model.	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.9.1	NFC Controller routing table	6.0 to 8.0	C018	N/A	N/A	N/A	
15.7.3.9.3	NFC Controller routing table	6.0 onwards	C018	N/A	N/A	N/A	
15.7.3.9.4	NFC Controller routing table	6.0 onwards	C018	N/A	N/A	N/A	

Test case	Test Case Title	TS.26 versions	Test case applicability				Applicable
			Android	Windows	BlackBerry	Others	Yes / No
15.7.3.10	Tap&Pay menu – routing of APDUs for payment services	8.0 onwards	C018	N/A	N/A	N/A	
15.7.3.11	Dynamic & Automatic switch of AID default route	8.0 onwards	C018	N/A	N/A	N/A	
15.8.3.1	“getVersion” API	6.0 onwards	M	N/A	N/A	N/A	
15.8.3.2	“getProperty” API	6.0 onwards	M	N/A	N/A	N/A	
15.9.3.1	Permissions	6.0 onwards	M	N/A	N/A	N/A	
15.9.3.2	APDU Logs	9.0 onwards	M	N/A	N/A	N/A	
Note 1: (See Test case 5.4): A limitation in relation to the test platform validation has been identified in the area of full OS support for GP SEAC test cases section 5.4. The TNR is a temporary solution until the industry has identified a permanent solution, the applicability of 5.4 will be reviewed for the next version of TS.27 and change to “M” (Mandatory) if possible. The industry including the involved stakeholders will in timely manner work on a solution in order to obtain full OS support for GP SEAC test cases section 5.4 within reasonable time schedule.							

Table 5: Applicability of tests

Conditional item	Condition
C001	VOID
C002	VOID
C003	VOID
C004	IF (O_EXT_RW_DISTANCE) THEN M ELSE N/A
C005	IF (O_BAT_LOW) THEN M ELSE N/A
C006	IF (O_BAT_OFF) THEN M ELSE N/A
C007	IF (O_MUL_SE AND O_Single_Active_CEE AND O_API_SWITCH_CEE) THEN M ELSE N/A
C008	IF (O_MULTI_APN) THEN M ELSE N/A
C009	IF (NOT_O_MULTI_APN) THEN M ELSE N/A
C010	IF (O_User_Confirm_Before_PDP_Context_Request) THEN M ELSE N/A

Conditional item	Condition
C011	IF NOT (O_User_Confirm_Before_PDP_Context_Request) THEN M ELSE N/A
C012	IF (O_ Single_Active_CEE) THEN M ELSE N/A
C013	VOID
C014	IF (O_NFC _PERSISTENCE) THEN M ELSE N/A
C015	IF (O_TAG_DISTANCE_2CM) THEN M ELSE N/A
C016	IF (O_TAG_DISTANCE_3CM) THEN M ELSE N/A
C017	IF (O_TAG_DISTANCE_4CM) THEN M ELSE N/A
C018	IF (O_MULTI_CEE_ON) THEN M ELSE N/A
C019	IF (O_MULTI_CEE_ON AND (O_DEFAULT_ROUTE_SELECTION_BY_USER_MENU OR O_REQ_143)) THEN M ELSE N/A
C020	IF (O_BUFFER_SIZE) THEN M ELSE N/A
C021	VOID
C022	IF (O_BEFORE_ANDROID_MARSHMALLOW) THEN M ELSE N/A

Table 6: Conditional items referenced by Table 5

2.1.6 Information to be provided by the Vendor

The Vendor shall provide information with respect to Device default configuration.

Item	Description	Value	Status
1	Preferred buffer size supported by the terminal for Open Channel command		C
Note: Conditional values shall be provided if the corresponding option is supported in Table 4: Options			

Table 6a: Device default configuration

2.2 General consideration

For the purpose of the test execution and unless specified, the UICC is the active Secure Element by default and the Access Control configuration provides full access to any AIDs from any mobile application.

Test descriptions are independent.

For each test described in this document, a chapter provides a general description of the initial conditions valid for the whole test. This description is completed by specific configurations to each individual sub-case.

After completing the test, the configuration is reset before the execution of the following test.

2.2.1 Test specifications

The GSMA NFC Handset Test Book refers to test specifications developed by other organisations (EMVCo, ISO, ETSI, 3GPP, Global Platform, NFC Forum, OMA and SIMalliance). These organisations defined their own requirements for test benches, test applicability and pass criteria's.

The GSMA fully relies on these test specifications for the purpose of the GSMA NFC Handset Test Book and requires these test to be performed. In the scope of the GSMA evaluation a list of tests will have to be conducted and are listed in Annex D.

When determining the applicability of the test cases for the DUT in each of these external test specifications, those device options with GSMA Status set to M in the relevant sub-section of Annex B should be set to Supported in the device options in the external test specification.

2.2.2 SIMalliance Open Mobile API

The SIMalliance Open Mobile API specification [6] is defined in an object oriented language-manner and may not be applicable for some OS platforms. Therefore, this Test Book is based on the SIMalliance specification for test steps description and pass criteria.

The mapping from Open Mobile API errors to Java based exceptions shall be as follows:

SIMalliance error	Java based exception
IOError	java.io.IOException
SecurityError	java.lang.SecurityException
NoSuchElementError	java.util.NoSuchElementException
IllegalStateError	java.lang.IllegalStateException
IllegalParameterError	java.lang.IllegalArgumentException

Table 8: Mapping from Open Mobile API errors to Java based exceptions

2.2.3 Pass criterion

A test execution is considered as successful only if the test procedure was fully carried out successfully.

A test execution is considered as failed if the tested feature provides an unexpected behaviour.

A test execution is considered as non-conclusive when the pass criteria cannot be evaluated due to issues during the setup of the initial conditions.

2.2.4 Future study

Some of the test cases described in this Test Book are FFS (For Future Study). This means that some clarifications are expected at the requirement level to conclude on a test method.

2.2.5 Test Cases "Direction"

Test cases includes a "Direction" column. Different test platform elements (mobile application, NFC tags, UICC,…) are involved in the test cases execution. This information is provided to clarify the test platform elements between which a test step is performed.

These elements or "actors" used over this document are listed in the table below:

Actor	Description
DUT	Represents the Device Under Test according to the definition of Device provided in section 1.3
ME	Represents the Mobile Equipment as defined in section 1.3. This is a synonym for the DUT, used in certain test cases for consistency with external specifications.
User	Represents the User as defined in section 1.3
Tag	Represents an NFC Tag according to section 2.5.4 "Tag testing"
PCD	Represents the contactless reader equipment. It follows requirements in section 2.5.6 "Reader equipment"
UICC	Represents the UICC as defined in section 2.5.1 of this test book
App	Represents the software application installed on the DUT to interact as the applicative level and check the capabilities of the DUT according to the Operating System
USS	Represents a system simulating the mobile network
Server	Represents the OTA server able to send data over the air. This should be part of the test environment defined in section 2.5.8

2.3 Tests with measurement and physical settings

Part of this testing refers to measurement or physical positions:

- Transaction duration measurement
- Power consumption measurement
- Distance between the DUT and a NFC tag or a contactless reader (reader and target are centred to each other).

For test cases relative to these characteristics, all relevant information to allow identifying the severity of detected issues must be added in the test report.

2.4 Reference Transaction

To ascertain correct implementation by the DUT of the card emulation mode as described [1], a reference transaction will be used.

The **reference transaction** is executed using a contactless reader as follows:

The transaction always starts with putting DUT into reader RF field. Then the reader establishes the contactless connection with the DUT. Afterwards the following APDUs will be exchanged. For each command, the test tool shall check that the expected response is returned by the DUT.

Command	Expected response
Select by AID A000000559500000000000000052414441	SW: '90 00'
Select by File ID (5F00)	SW: '90 00'
Select by File ID (1F00)	SW: '90 00'
Read Binary	Response data: 128 bytes with value '00' SW: '90 00'
Update Binary (with 128 bytes with value 0xFF)	SW: '90 00'
Read Binary	Response data: 128 bytes with value 'FF' SW: '90 00'
Update Binary (with 128 bytes with value 0x00)	SW: '90 00'
External Authenticate	SW: '90 00'

The transaction always ends with a DESELECT and finally the removal of DUT from reader RF field.

For this purpose, a UICC application will be used as a part of the test equipment.

Annex A of this document proposes a description of the application and its corresponding source code. In case of the simulated UICC the complete behaviour of this referenced application shall be simulated. The parts related to each single test shall be simulated according to the description given in the specific test case.

2.5 Test Equipment

This chapter aims at describing different test tools for evaluation of the subsequent test packages. Names assigned to these applications are also used in the test case descriptions.

Implementation of these applications remains the responsibility of the provider. Nevertheless, a description of the test equipment used for testing (brand name, model name and version) will be provided as a part of the test report.

The .cap files mentioned within this document provide description of the UICC behaviour which can be either simulated or a real UICC. The simulation of the behaviour remains language-independent. The test equipment/case manufacturer could use other means to gain the same behaviour as specified in the Java .cap files.

2.5.1 UICC

For all the tests described in this GSMA NFC Handset Test Book, a UICC/eUICC must be used. For most of the test sequences described in this document the UICC has an important role in the test bench and should be managed by Test Labs as test tool.

The test environment can be implemented via use of real UICCs or via simulated environment for UICCs.

The following terms for test environment are used:

Real UICC: A real UICC is used during testing. Typically this is a physically available UICCs provided by UICC manufacturers.

Simulated UICC: The UICC is emulated with a simulator which provides corresponding functionalities as a valid UICC.

In order to ensure best possible traceability and reproducibility of test results, the following sections define requirements for the different test environments.

2.5.1.1 Requirements for UICC environment

If the test cases in this NFC Handset Test Book are implemented using UICCs, the requirements for test environment described in this section shall be fulfilled.

The UICC (simulated or real) shall act as a valid UICC according to the following specifications:

- [8]: ETSI TS 102 221:"Smart Cards; UICC-Terminal interface; Physical and logical characteristic".
- [9]: ETSI TS 102 613:"Smart Cards; UICC-Contactless Front-end (CLF) Interface; Part 1: Physical and data link layer characteristic".
- [10]: ETSI TS 102 622:"Smart Cards; UICC-Contactless Front-end (CLF) Interface; Host Controller Interface (HCI)".

In particular, during test procedure execution, the UICC shall respect the electrical and signalling conditions for all UICC contacts within the limits given by ETSI TS 102 613 [9], TS 102 221 [8] and ETSI TS 102 622 [10]). The accuracy of the UICC simulator’s settings shall be taken into account when ensuring this.

The UICC (simulated or real) shall be connected to the device under test (DUT) and shall provide functionalities specified below:

- Shall support card emulation, reader and connectivity gates as specified in ETSI TS 102622 [10].
- Shall support card emulation in both full power mode and low power mode, as specified in ETSI TS 102 613 [9] and ETSI TS 102 622 [10] for Type A, Type B and Type F.
- Shall support CLT mode in full power mode and in low power mode, as specified in ETSI TS 102 613 [9] and ETSI TS 102 622 [10].

- For the case 4 APDU exchanges utilizing T=0 transmission protocol and originating from the Secure Element Access (e.g. SIMalliance OMAPI Transport API Test Specification" [5]), and when the UICC is required to return an R-APDU with response data and with SW='62 XX' or SW='63 XX' in response to a case 4 C-APDU, the UICC shall follow the processing described in ISO/IEC 7816-3 [35], case 4S.3. Specifically, the first response TPDU shall be '61YY'; after the GET RESPONSE command from the device, the second response TPDU shall be <response-data> '62/63 XX'.
- Shall support GlobalPlatform Secure Element Access Control both for ARA and ARF mechanism
- Shall support BIP and APN as specified in 3GPP TS 31.124 [21]
- Shall provide all necessary information (Specification, ADM codes) to manage the card content and the file system

In addition to the above listed requirements the UICC simulator shall implement the following functionalities:

- Shall fulfil the requirements for SWP/HCI as specified in ETSI TS 102 694-1 [11] clause 4.4, and ETSI TS 102 695-1 [12] clause 4.4
- Shall fulfil the requirements for Remote Management of NFC Services and for Mobile Device APN as specified in 3GPP TS 31.121 [20] clause 4.1 and in 3GPP TS 31.124 [21] in 27.22.2A, 27.22.2B and 27.22.2C.
- Shall implement the behaviour for the device interface commands in the scope of the Secure Element Access Control related device tests (e.g.: GET_DATA [all], GET_DATA [specific] for ARA)

2.5.1.2 UICC Form Factor

All UICC form factors, as specified in ETSI TS 102 221 [8] chapter 4.0; shall be provided by the simulated and real UICC environment.

2.5.2 Requirements for UMTS Network Simulator

For Basic Remote Management of NFC Services (section 12.3) and Mobile Device APN Management (section 11) test execution, the test equipment shall fulfil the requirements specified in 3GPP TS 34.108 [25] clause 4. Network simulator set up for other sections is defined in the relevant chapters.

2.5.3 Common applications

The following applications are common to different test packages.

2.5.3.1 UICC Applications

- **ReferenceApplication.cap**: A UICC application according to the description in Annex A, which can be used to run the reference transaction. The source code of this application is available at:

  https://github.com/GSMATerminals/NFC-Test-Book-Public

- **APDU_TestApplication.cap**: Based on the ReferenceApplication.cap**,** this application allows managing different APDU answers. The application sends

EVT_TRANSACTION on the EVT_FIELD_OFF event. The application implements the sequence used by the MobileApplication (defined in Chapter 2.5.3.2):

- On APDU Case 1 => 0x0001[P1]00
  - returns SW1-SW2
- On APDU Case 2 => 0x0002[P1]00FF
  - returns [Data field of 0xFF bytes long] only if SW1 = 0x62 or 0x63 or 0x90 + SW1-SW2
- On APDU Case 3 => 0x0003[P1]00FF [Data field of 0xFF bytes long]
  - returns SW1-SW2
- On APDU Case 4 => 0x0004[P1] 00FF [Data field of 0xFF bytes long and expected data length is 0xFF]
  - returns [Data field of 0xFF bytes long] only if SW1 = 0x62 or 0x63 or 0x90 + SW1-SW2

Depending of [P1] in the APDU command; the application will return the corresponding SW1-SW2.

[P1]	SW1-SW2
0x01	0x6200
0x02	0x6202
0x03	0x6280
0x04	0x6281
0x05	0x6282
0x06	0x6283
0x07	0x6284
0x08	0x6285
0x09	0x6286
0x0A	0x62F1
0x0B	0x62F2
0x0C	0x6300
0x0D	0x6381
0x0E	0x63C2
0x0F	0x6310

[P1]	SW1-SW2
0x10	0x63F1
0x11	0x63F2
0x12	0x6400
0x13	0x6401
0x14	0x6402
0x15	0x6480
0x16	0x6500
0x17	0x6581
0x18	0x6800
0x19	0x6881
0x1A	0x6882
0x1B	0x6883
0x1C	0x6884
0x1D	0x6900
0x1E	0x6900
0x1F	0x6981
0x20	0x6982
0x21	0x6983
0x22	0x6984
0x23	0x6985
0x24	0x6986
0x25	0x6987
0x26	0x6988
0x27	0x6A00
0x28	0x6A80
0x29	0x6A81
0x2A	0x6A82
0x2B	0x6A83
0x2C	0x6A84
0x2D	0x6A85
0x2E	0x6A86
0x2F	0x6A87
0x30	0x6A88

[P1]	SW1-SW2
0x31	0x6A89
0x32	0x6A8A

Table 9: Status Word

- **APDU_TestApplication_card_deactivated.cap:** a modified version of the APDU_TestApplication.cap. This application sends EVT_TRANSACTION only on the EVT_CARD_DEACTIVATED event.

2.5.3.2 Device Applications

- **MobileApplication:** A device application allowing the following access to the UICC:
  - Open Logical Channel via Select AID
    - SELECT_BY_DF_name on AID01
  - Send APDU Case 1 => 0x0001[P1]00
    - Nominal expected response is SW1-SW2
  - Send APDU Case 2 => 0x0002[P1]0000
    - Nominal expected response is [Data field of 0xFF bytes long] only if SW1 = 0x62 or 0x63 or 0x90 + SW1-SW2
  - Send APDU Case 3 => 0x0003[P1]00FF [Data field of 0xFF bytes long]
    - Nominal expected response is SW1-SW2
  - Send APDU Case 4 => 0x0004[P1]00FF [Data field of 0xFF bytes long] FF
    - Nominal expected response is [Data field of 0xFF bytes long] only if SW1 = 0x62 or 0x63 or 0x90 + SW1-SW2
  - Additionally the application will allow sending APDUs with all the other Class Instruction pairs [CLAINS] from 0x0000 to 0xFEFF excluding INS = 0x70, 0x6x, 0x9x for all CLA
    - Send all CLA/INS pairs => 0x[CLAINS]000010 [Data field of 0x10 bytes long]
      - Nominal expected response is [Data field of 0x10 bytes long] + SW1-SW2
    - [P1] identifies the sub case.
      - When not specified in the test case, [P1] equals 0x00 meaning default SW1-SW2 is 90 00.

For testing purpose, 2 or 3 occurrences of the application will be created:

- **GSMA_Mobile_App_SP1_signed** signed with a private key corresponding to test certificate #1
- **GSMA_Mobile_App_SP2_signed** signed with a private key corresponding to test certificate #2

MobileApplication is considered as launched if it is selected and started by the User.

On Android Devices supporting Multiple Card Environment the AIDs of the instances of ReferenceApplication.cap shall be registered with “Other” category for each test case where the ReferenceApplication.cap (or derivative) is used.

NOTE: The AID registration does not apply to test cases in section 15.7.

On Android Devices supporting Multiple Card Environment the AIDs of the instances of APDU_TestApplication.cap shall be registered with “other” category for each test case where the APDU_TestApplication.cap (or derivative) is used.

NOTE: The AID registration does not apply to test cases in section 15.7.

On Android Devices supporting Multiple Card Environment the AIDs of the instances of APDU_TestApplication_card_deactivated.cap shall be registered with “other” category for each test case where the APDU_TestApplication_card_deactivated.cap (or derivative) is used.

NOTE: The AID registration does not apply to test cases in section 15.7.

2.5.3.3 Other Applications

APDU application: A software application running on a PC connected to a contactless reader. This application will be used to send C-APDU to the DUT and get the corresponding R-APDU.

2.5.3.4 Logically

The reference PKCS#15 structures are using the following AID´s:

AID_REF = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 41’

AID01 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31’

AID02 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 32’

AID03 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 33’

2.5.4 Tag Testing

The test environment described in this GSMA NFC Handset Test Book can be implemented to use real Tags or simulated Tags.

The following terms for test environment are used:

Real Tags: A real Tag is used during testing. Typically this is a physically available Tag provided by Tag manufacturers. A list of reference Real Tags are defined in Annex C.

Simulated Tags: The Tag is emulated with a simulator which provides corresponding functionalities as specified by the NFC Forum. It is provided by test tool manufacturers.

2.5.4.1 Common positioning of Device and Tag

A number of the test cases require the use of a Tag which shall be positioned relative to the DUT. Contactless communication between the device and the Tag is part of the verdict evaluation of the test cases. Therefore it is essential that a minimum set of positions are defined in order to ensure the test cases are executed in a reproducible way.

The following are definitions for DUT and Tag:

DUT antenna reference point:

- This is the position on the DUT which will provide the optimal performance of the NFC antenna. If the device includes an indication to the user of the position of the NFC antenna (see TS26_NFC_REQ_107), the position as indicated to the user shall be used. Otherwise, this point shall be provided by the device manufacturer for testing purposes; the reference point shall be marked on the outside cover of the device.

- Tag antenna reference point:
  - This is the position at the Tag where the antenna performance is optimal. For a real Tag this point is provided by the Tag vendor or measured by the test laboratory. For a reader/listener antenna, the point is provided by the vendor of the antenna.

Positioning of DUT and Tag for test cases where there is no requirement to the distance between DUT and Tag, the DUT and Tag are positioned as follows:

- The DUT and Tag are placed with their antenna reference points located as close as possible to each other taking into account the form factor of the DUT.
- The DUT and Tag are positioned both in a vertical position as default position. I.e. with a traditional DUT form factor and a Tag with ID1 form factor, the positioning will be as below:

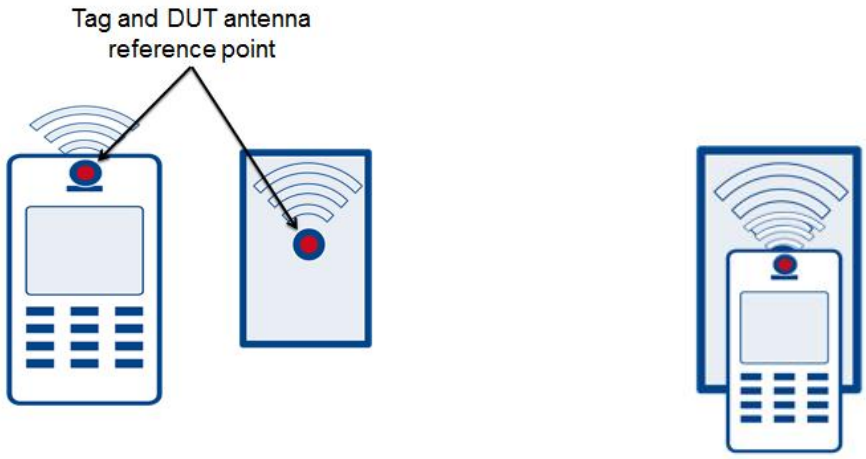


Figure 3: Tag and DUT antenna reference point

- The DUT and Tag is positioned in parallel plans as possible due to form factor of the DUT. Ideally the position will looks like:

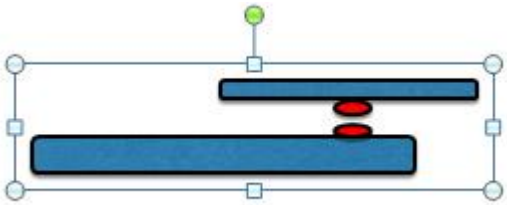


Figure 4: Antenna positioning

The positioning shall provide optimal antenna coupling between DUT and Tag.

The following conditions shall be fulfilled to limit the impact of external noise by executing all contactless tests in the present test specification:

The external interferences sources:

Metal objects or any other interference elements shall be kept at least 15cm from the Test System.

Any magnetic field shall not be present in a volume of 1 meter around the Test System; e.g. no other antennas, contactless terminals, cell phones, etc.

The DUT and the Tag must be placed so that the radio communication can correctly take place.

2.5.4.2 Distance specific positioning

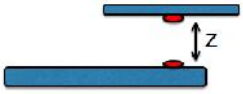


Figure 5: “z” distance

For the test cases specifying exact distance between DUT and Tag, the distance is the vertical distance between DUT and Tag antenna reference points. The following distances are used during distance testing:

- z = 0,0cm
- z = 0,5cm
- z = 1,0cm
- z = 2,0cm
- z = 3,0cm
- z = 4,0cm

The distance setting accuracy: +/- 0,05cm

The distance z is measured from the device outside cover to the Tag independent if the antenna is located inside the DUT.

For test cases not specifying a distance between DUT and Tag, the default distance is z = 0,0cm between DUT and Tag antenna reference point.

2.5.4.3 Tag requirements

NFC Forum Type 1 Tag:

- Provide the functionality specified in NFCForum TS Type 1 Tag [19]

NFC Forum Type 2 Tag:

- Provide the functionality specified in NFCForum TS Type 2 Tag [19]

NFC Forum Type 3 Tag:

- Provide the functionality specified in NFCForum TS Type 3 Tag [19]

NFC Forum Type 4A Tag:

- Provide the functionality specified in NFCForum TS Type 4 Tag [19]

NFC Forum Type 4B Tag:

- Provide the functionality specified in NFCForum TS Type 4 Tag [19]

2.5.4.4 Tag Read/Write Applications

The following applications are dedicated to NFC tag related test cases.

NFC Tag application: An external tag reader and writer with application for tag content read verification and for tag writing of reference tags. The tag reader/writer shall support NFC Forum Type 1-4 tags, as specified in NFC Forum Tag Operation Specifications [19].

NFC Tag mobile application: A mobile application based on the operating system standardized APIs for tag reading and writing. This application is typically provided by the device Vendor or by the test tool manufacturer.

Reference NFC Tags: A set of reference NFC tags (Type 1, 2, 3 and 4) as specified in Annex C.

2.5.4.5 Reference NFC tag content

The following NFC Tag content will be used when not otherwise specified

Reference	NFC Tag Content
"vCard"	Type: "text/x-vCard" BEGIN:VCARD VERSION:2.1 N:Smith;John;;; FN:John Smith TEL;CELL: 332312345678 END:VCARD
"URI"	Type: "U" file://test
"Text"	Type: "T" Encoding: UTF-8 Lang: "en-US" "Hello, world!"
"SmartPoster" (launch browser)	Type: "Sp" Text Type: "T" Encoding: UTF-8 Lang: "en-US" Test: "GSMA Website" URI Type: "U" http://www.gsma.com
"SmartPoster" (SMS Sending)	Type: "Sp" URI Type: "U" sms:332312345678?body=Hello, world!
"SmartPoster" (phone call)	Type: "Sp" Text Type: "T" Encoding: UTF-8 Lang: "en-US" Test: "John Smith" URI Type: "U"

Reference	NFC Tag Content
	Tel: 442312345678
“SmartPoster” (email)	Type: “Sp” URI Type: “U” mailto:john.smith@gsma.com?subject=email subject&body=email content Text Type: “T” Encoding: UTF-8 Lang: “en-US” Test: “email title”

Table 10: NFC Tags content

NOTE 1: For NFC Type 2 Tag, these tag contents represent either static or dynamic memory layouts.

NOTE 2: For NFC Type 1 Tag, these tag contents represent dynamic memory layouts. NFC Type 1 Tag with Static Memory Layout is FFS.

2.5.4.6 NFC Forum Analog Tests

Support of the GSMA Transport requirements using NFC protocol requires the inclusion of NFC Forum’s Analog Specification to ensure interoperability. References to the NFC Forum Digital Protocol and Activity Specifications are added for completeness as devices need to be compliant to all three technical specifications in order to support the transport testing requirements covered by the suite of NFC Forum Analog test cases.

2.5.5 Reader equipment

The contactless reader shall support the NFC Forum type A and B functionality.

2.5.6 NFC Controller and UI application triggering

For NFC Controller and UI application triggering, specific test applications will be defined in the initial conditions of the tests.

Unless otherwise specified, when EVT_TRANSACTION is used for triggering a certain application, the event shall be received by the application within 30 seconds from the point that this event has been sent by the UICC. In the case where no application is expected to receive the event, the test tool shall wait for 60 seconds.

(NOTE: These times are specified for this version of the test book for test implementation purposes. Normative times are expected to be defined by the TSG NFC Handset Requirement Group in a future version of TS.26)

Unless otherwise specified, when a card emulation session is present within a test procedure, the test shall be carried out with Card emulation Type A as specified in [9] and [10].

2.5.7 Test Set-Up for OTA communication

A real OTA Platform connected to the network's backend communicates through the Radio Access Network and the Device with the UICC.

The communication network shall be LTE only as specified in 3GPP TS 36.508 [36] clause 4 or with 3G/2G fallback according to the capability of the DUT.

To allow for testing in a lab environment, some of the real world components may be replaced by simulations:

- OTA Server may be replaced by a software simulation.
- Radio Access Network may be replaced by a system simulator.
- UICC may be replaced by a simulated UICC.

Such a setup does not require any Internet or Intranet connection. It allows for deep diagnosis insights into all involved components. It also enables manipulation of any of the components, e.g. for failure simulation.

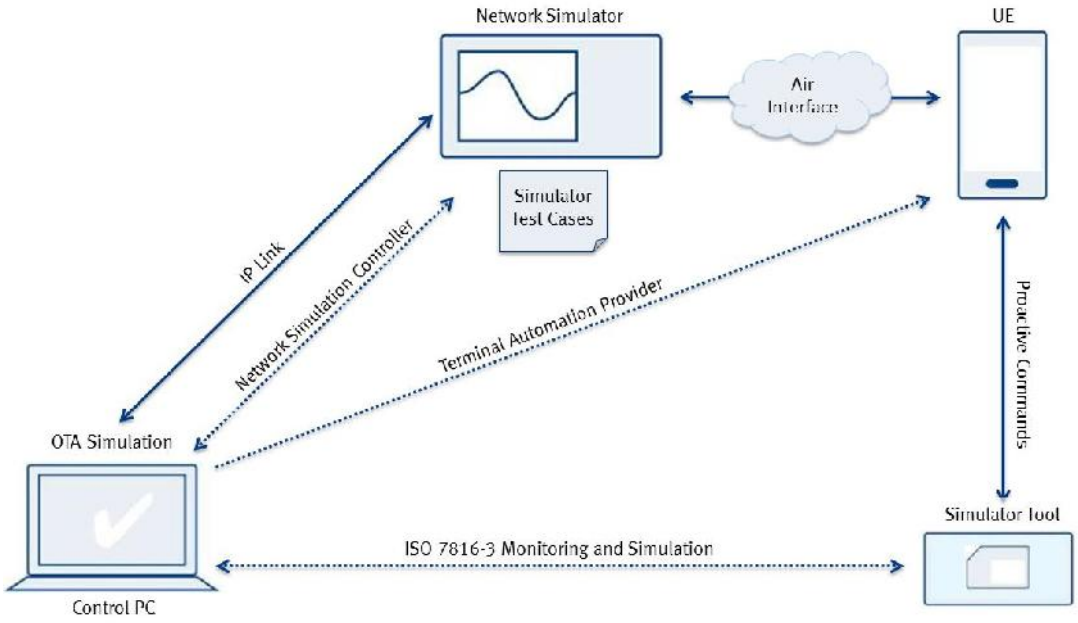


Figure 6: Test Environment

For delivering the SMS push to the UICC, the real world OTA platform will use an SMPP gateway. For ease of testing the real world OTA platform can be replaced by a simulated environment, this should also be simulated by the control PC.

There might be high volume data transmissions through a data channel between the UICC and the OTA Platform, e.g. when deploying an applet of ~100k from the OTA platform to the UICC.

2.5.8 Card emulation testing

2.5.8.1 Common positioning of Reader and Device

The provisions of section 2.5.4.1 apply with the tag and tag antenna reference point being replaced by the reader and reader antenna reference point.

2.5.8.2 Distance specific positioning

The provisions of section 2.5.4.2 apply with the tag and tag antenna reference point being replaced by the reader and reader antenna reference point and only with distances up to 2.0cm.

2.6 Common procedures

2.6.1 Setting the default AID route

This section applies only to devices which support O_MULTI_CEE_ON

Various test cases indicate that the default AID route should be set to HCE or to UICC. This section addresses how to achieve that condition for devices with different attributes according to the following logic:

If the DUT supports O_DEFAULT_ROUTE_SELECTION_BY_USER_MENU then the default AID route shall be set using the user menu.

If the DUT supports O REQ143 then the default AID route shall be set using the procedures defined in Sections 2.6.1.1, 2.6.1.2.

If the DUT uses Android OS and supports O_MULTI_CEE_ON, but does not support either O_DEFAULT_ROUTE_SELECTION_BY USER_MENU or O_REQ_143 then the default AID route is expected to be HCE by default.

2.6.1.1 Procedure to ensure the default AID route is HCE with O_REQ_143

The aim of this procedure is to provide a method in order to ensure that the default AID route on the DUT is set to HCE.

This procedure is intended to be executed as part of a referencing test case.

When this procedure has been successfully completed, Dynamic Other Host will be installed, 255 AIDs (TestAIDHCE xx) will be registered, and the default route will be set to HCE.

Note: This procedure shall be run even if the default AID route of the device is already HCE, in order to fill up the routing table with AIDs.

Initial conditions:

- DUT is powered ON and device is unlocked and the screen ON

Applications needed:

- Dynamic_Other_Host: An application able to register a configurable list non-payment AID on the HOST (HCE) using the dynamic registration API.
- AIDs generated by the application SHALL be AIDs of 16 byte matching the following template:
- The 1st byte of the TestAIDHCE xx shall be increased by one bit for each consecutive AID starting from 0x01.
- The 16th byte of the TestAIDHCE xx shall be set to "0x01"
- The other bytes of the AID shall be set according to the table below:

AID byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	0x01 for TestAIDHCE01 0x02 for TestAIDHCE02 … 0x64 for TestAIDHCE100 ….. 0xFF for TestAIDHCE255															
value		0x 02	0x 03	0x 04	0x 05	0x 06	0x 07	0x 08	0x 09	0x 10	0x 11	0x 12	0x 13	0x 14	0x 15	0x 01

Step	Direction	Sequence	Expected Result
1	User →DUT	Install Application Dynamic_Other_Host	Installation successful
2	User →DUT	Use Dynamic_Other_Host and register 255 Host AIDs	No error while registering the AIDs

2.6.1.2 Procedure to ensure the default AID route is UICC with O_REQ_143

The aim of this procedure is to provide a method in order to ensure that the default AID route on the DUT is set to UICC.

This procedure is intended to be executed as part of a referencing test case.

When this procedure has been successfully completed, Dynamic_Other_OffHost will be installed, 255 AIDs (TestAIDUICC xx) will be registered, and the default route will be set to UICC.

Note: This procedure shall be run even if the default AID route of the device is already UICC, in order to fill up the routing table with AIDs.

Initial conditions:

- DUT is powered ON and device is unlocked and the screen is ON

Applications needed:
Dynamic_Other_OffHost: An application able to register a configurable list of non-payment AID on the OffHost UICC using the dynamic registration GSMA API.

- AIDs generated by the application SHALL be AIDs of 16 byte matching the following template:
- The 1st byte of the TestAIDUICC xx shall be increased by one bit for each consecutive AID starting from 0x01.
- The 16th byte of the TestAIDUICC xx shall be set to "0x02"
- The other bytes of the AID shall be set according to the table below:

AID byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
value	0x01 for TestAIDUICC01 0x02 for TestAIDUICC02 … 0x64 for TestAIDUICC100 ….. 0xFF for TestAIDUICC255	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x02

Step	Direction	Sequence	Expected Result
1	User →DUT	Install Application Dynamic_Other_OffHost	Installation successful
2	User →DUT	Use Dynamic_Other_OffHost and register 255 OffHost AIDs	No error while registering the AIDs

2.6.2 Procedure to identify the size of the AID routing table of a DUT

The purpose of this procedure is to provide a method in order to know the maximum number of 16 bytes AID that can be inserted in the AID routing table of a DUT before reaching an AID routing overflow.

This procedure implies that TS26_NFC_REQ_143 is implemented on the DUT in order to work. So it is advised to ensure this requirement is implemented before applying the procedure.

This method is applicable at any time on the device as long as initial conditions are met.

This procedure is intended to be executed independently of any test case.

Initial conditions:

- The UICC contains a cardlet with a known AID [referred as AID01].
- AID01is only available on the UICC
- AID01is not registered to the Host using a device application (neither in manifest nor dynamically)
- All NFC applications on the device are uninstalled except applications that are preinstalled
- The default AID route is set to UICC. (See section 2.6.1.2)
- Device is powered ON and device is unlocked and the screen is ON

Applications needed:

- RTS_Dynamic_Other_Host : An application able to register a configurable list of non-payment AID on the Host using dynamic registration API of the operating system.

- AIDs generated by the application SHALL be AIDs of 16 byte matching the following template:
- The 1st byte of the RTSTestAIDHOST xx shall be increased by one bit for each consecutive AID starting from 0x01.
- The other bytes of the AID shall be set according to the table below:

AID byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
value	0x01 for RTSTestAIDHOST01 0x02 for RTSTestAIDHOST02 … 0x64 for RTSTestAIDHOST100 ….. 0xFF for RTSTestAIDHOST255	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x03

AID01 is different from the AIDs generated by any application installed

Step	Direction	Sequence	Expected Result
1	User →DUT	Unregister 254 TestAIDUICC that were registered using 2.6.1.2 procedure (Keep one TestAIDUICC) Define a counter N=0	
2	User →DUT	Install Application RTS_Dynamic_Other_Host	Installation successful

Step	Direction	Sequence	Expected Result
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
4	User → PCD	Power on the field	
5	PCD → DUT	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned [UICC is reachable with no registered AID01]
6	User → PCD	Power off the field	
7	App→DUT	Use "RTS_Dynamic_Other_Host" to find routing table size. Add one new HostAID, AIDs of 16 bytes Increase N=N+1	
8	Loop	Repeat steps 4 to 7 while SW ’90 00’ is returned in step 5	
9	User	Write down the (N-1) number as the RTS size. This value represent the number of AIDs added successfully in the AID routing table of the DUT	
10	User →DUT	Uninstall "RTS_Dynamic_Other_Host" application	

The RTS (RoutingTableSize) value = N-1 (Step9).

NOTE: RTS = the number of 16 bytes AIDs that can be contained in the NFC AID Routing table of the DUT

2.6.3 Procedure to send a transaction event

Various test cases require the sending of a transaction event (EVT Transaction). Depending on the approach and for sake of clarity, sending a transaction event is considered as a single test step. Nevertheless, each time this step applies in a TC, the following procedure must be executed.

This procedure is intended to be executed as part of a referencing test case.

Direction	Sequence	Expected Result
PCD	Power on RF field	

Direction	Sequence	Expected Result
PCD → DUT	Perform RF protocol initialisation	
PCD → DUT	Using the **APDU application**, send a SELECT command with *[AIDxx]*	**APDU Application** receives Status Word 90 00
PCD	Power off RF field	
DUT → UICC	Send EVT_FIELD_OFF	
	The **card application** sends EVT_TRANSACTION to the **mobile application**	*[Expected result]*

- *[AIDxx]* has to be replaced by the AID from the step calling this procedure.
- *[Expected result]* is the expected result detailed in the test case as expected result of the step calling this procedure.
- On Android Devices supporting Multiple Card Emulation Environment the *[AIDxx]* needs to be registered with “other” category so that the event transaction procedure can be successfully performed. Note: This AID registration does not apply to test cases in section 15.7.

3 NFC Features

3.1 General overview

This chapter addresses the NFC features covering the contactless interfaces between the device and NFC Tag and Reader respectively as well as the interface between NFC controller and UICC (SWP/HCI).

The test cases are grouped in three sub sections covering respectively NFC Read/Write Mode section, Card Emulation Mode testing and NFC core functions including the SWP/HCI testing.

The list of conformance requirements tested within this section is listed in the table in section 3.2.

3.2 Conformance requirements

TS26_NFC_REQ_006	The NFC controller SHALL support SWP (Single Wire Protocol) interface with the UICC as per ETSI TS 102.613.
TS26_NFC_REQ_007	The NFC controller SHALL support HCI with the UICC as per ETSI TS 102 622
TS26_NFC_REQ_008	Contactless tunnelling (CLT=A) mode SHALL be supported for SWP (per ETSI TS 102 613).
TS26_NFC_REQ_009.1	Contactless tunnelling (CLT=F) mode SHALL be supported for SWP (per ETSI TS 102 613).
TS26_NFC_REQ_010	The device interface with UICC SHOULD support Class B
TS26_NFC_REQ_011	The device interface with UICC SHALL support Class C
TS26_NFC_REQ_014	The device interface with UICC SHALL support DEACTIVATED followed by subsequent SWP interface activation in full power mode.
TS26_NFC_REQ_015	The NFC controller SHOULD support both windows size set to 3 and set to 4.
TS26_NFC_REQ_020	When the mobile device is automatically switched off, and enters battery low mode, the mobile device SHALL be able to perform 15 transactions in card emulation within the following 24 hours
TS26_NFC_REQ_021	NFC transactions SHALL be possible either in battery power off or battery low mode.
TS26_NFC_REQ_025	The mobile device SHALL support Card-emulation as per NFC Forum TS-Analog, TS-Digital and TS-Activity Specifications.
TS26_NFC_REQ_026	Card Emulation mode SHALL be enabled when the NFC is turned on.
TS26_NFC_REQ_027	For Card emulation mode the read distance SHALL be in the 0cm – 2cms range for battery operational mode, battery low or power off mode.
#TS26_NFC_REQ_033	The mobile device SHALL support Reader/Writer Mode as per NFC Forum TS-Analog, TS-Digital and TS-Activity Specifications.
TS26_NFC_REQ_034	The mobile device SHALL support NFC Forum Type 1 Tag as specified in NFC Forum Type 1 Tag Operation Specification.

TS26_NFC_REQ_035	The mobile device SHALL support NFC Forum Type 2 Tag as specified in NFC Forum Type 2 Tag Operation Specification.
TS26_NFC_REQ_036	The mobile device SHALL support NFC Forum Type 3 Tag as specified in NFC Forum Type 3 Tag Operation Specification.
TS26_NFC_REQ_037	The mobile device SHALL support NFC Forum Type 4 Tag as specified in NFC Forum Type 4 Tag Operation Specification.
TS26_NFC_REQ_038	Reader mode events SHALL be routed exclusively to the UICC or the Application processor.
TS26_NFC_REQ_039	The default routing for the reader mode events SHALL be via the Application processor.
TS26_NFC_REQ_040	The NFC Controller SHOULD support Reader Mode as per ETSI TS 102 622
TS26_NFC_REQ_041	The device SHALL support automatic and continuous switching between card emulation and reader mode.
TS26_NFC_REQ_042	A transaction time SHALL take 500ms or less for TAG message length not exceeding 100 bytes. The transaction time is defined from the start of the frame of the first RF command receiving an answer, to the end of the frame of the response to the last received RF command by a device, where the RF command is used to read the content in a tag
TS26_NFC_REQ_043	The mobile device SHALL be able to read/write the NFC Forum Smart Poster RTD.
TS26_NFC_REQ_044	The TAG SHALL be read at a distance of 1 cm and at distances between 0 to 1 cm. Note This requirement will be tested with a TAG Test Reference system agreed in the Test Book group.
TS26_NFC_REQ_110	The Tag SHOULD be read at a distance from 1 cm to 4 cm. Note: This requirement will be tested with a Tag Test Reference system agreed in the Test Book group.
TS26_NFC_REQ_157	The device SHALL implement the requirements of the EMV Contactless Communication Protocol Specification, Book D.

NOTE: This indicates the requirement is still work in progress according to TS.26 NFC Handset Requirements

3.3 Reader/Writer mode

3.3.1 General overview

This chapter addresses the functions of the device for NFC Tag reading and writing according to the NFC Forum specification testing on application level in sections 3.3.3.1 – 3.3.3.8 and testing lower level functionality in section 3.3.3.24. A limited set of distances between device and NFC Tag is covered in section 3.3.3.9 – 3.3.3.13. Reading performance and general reader mode testing are covered in sections 3.3.3.14 – 3.3.3.23.

The list of conformance requirements tested within this section is listed in the table in section 3.3.2.

3.3.2 Conformance requirements

TS26_NFC_REQ_034	The mobile device SHALL support NFC Forum Type 1 Tag, as specified in NFC Forum Type 1 Tag Operation Specification. This requirement applies to both protocol and application level.
TS26_NFC_REQ_035	The mobile device SHALL support NFC Forum Type 2 Tag, as specified in NFC Forum Type 2 Tag Operation Specification. This requirement applies to both protocol and application level.
TS26_NFC_REQ_036	The mobile device SHALL support NFC Forum Type 3 Tag, as specified in NFC Forum Type 3 Tag Operation Specification. This requirement applies to both protocol and application level.
TS26_NFC_REQ_037	The mobile device SHALL support NFC Forum Type 4 Tag, as specified in NFC Forum Type 4 Tag Operation Specification. This requirement applies to both protocol and application level.
TS26_NFC_REQ_038	A reader mode events SHALL be routed exclusively to the UICC or the Application processor.
TS26_NFC_REQ_039	The default routing for the reader mode events SHALL be via the Application processor.
TS26_NFC_REQ_040	The NFC Controller SHOULD support Reader Mode as per ETSI TS 102 622
TS26_NFC_REQ_042	A transaction time SHALL take 500ms or less for TAG message length not exceeding 100 bytes. The transaction time is defined from the start of the frame of the first RF command receiving an answer, to the end of the frame of the response to the last received RF command by a device, where the RF command is used to read the content in a tag
TS26_NFC_REQ_043	The mobile device SHALL be able to read/write the NFC Forum Smart Poster RTD.
TS26_NFC_REQ_044	The Tag SHALL be read at a distance of 1 cm and at distances between 0 to 1 cm. Note: This requirement will be tested with a Tag Test Reference system
TS26_NFC_REQ_110	The Tag SHOULD be read at a distance from 1 cm to 4 cm. Note: This requirement will be tested with a Tag Test Reference system agreed in the Test Book group.

3.3.3 Test Cases

3.3.3.1 NFC Forum Type 1 Tag – Read NFC Tag

Test Purpose

To ensure the DUT allows reading of NFC Forum Type 1 Tag as specified in NFC Forum Type 1 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_034

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to read the specified Tag format. This application is provided with the default DUT software or a reference application is installed

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- The test shall be executed for each of the following tag contents to perform the test:
  - NFC Type 1 Tag is personalized with a “vCard”
  - NFC Type 1 Tag is personalized with a “URI”
  - NFC Type 1 Tag is personalized with a “Text”
    - In case of using reference tag: configuration and personalization of tags shall be performed independently of the DUT.
    - The DUT is not placed in the Read Range (more than 50cm from the Tag).

3.3.3.1.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in NFC read range	If the DUT requests Tag contents to be accepted, the user shall accept this request.
2	DUT → App	The DUT to read the tag content	The tag content is correctly received by the application.
3	User → DUT	Remove the DUT from the read range	None
4	User → DUT	Repeat steps 1 through 3 for each tag content specified in the initial conditions in 3.3.3.1 for the Type 1 Tag	None

3.3.3.2 NFC Forum Type 2 Tag – Read NFC Tag

Test Purpose

To ensure the DUT allows reading of NFC Forum Type 2 Tag with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 2 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_035
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to read the specified Tag format. This application is provided with the default DUT software or a reference application is installed.

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- The following tag content should be configured to perform the test:
  - NFC Type 2 Tag is personalized with a “SmartPoster” (launch browser)
  - In case of using reference tag: configuration and personalization of tags shall be performed independently of the DUT.
- The DUT is not placed in the Read Range (more than 50cm from the Tag).

3.3.3.2.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in NFC read range	If the DUT requests Tag contents to be accepted, the user shall accept this request.
2	DUT → App	The DUT to read the tag content	The tag content is correctly received by the application.
3	User → DUT	Remove the DUT from the read range	None

3.3.3.3 NFC Forum Type 3 Tag – Read NFC Tag

Test Purpose

To ensure the DUT allows reading of NFC Forum Type 3 Tag with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 3 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_036
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to read the specified Tag format. This application is provided with the default DUT software or a reference application is installed.

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- The following tag content should be configured and used in the following order to perform the test:
- NFC Type 3 Tag is personalized with a “SmartPoster” (SMS Sending)
    - In case of using reference tag: configuration and personalization of tags shall be performed independently of the DUT.
- The DUT is not placed in the Read Range (more than 50cm from the Tag).

3.3.3.3.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in NFC read range	If the DUT requests Tag contents to be accepted, the user shall accept this request.
2	DUT → App	The DUT to read the tag content	The tag content is correctly received by the application
3	User → DUT	Remove the DUT from the read range	None

3.3.3.4 NFC Forum Type 4 Tag – Read NFC Tag

Test Purpose

To ensure the DUT allows reading of NFC Forum Type 4A Tag and Type 4B platforms with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 4A & 4B Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_037
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to read the specified Tag format. This application is provided with the default DUT software or a reference application is installed.

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- In case of using reference tag: configuration and personalization of tags shall be performed independently of the DUT.
- The DUT is not placed in the Read Range (more than 50cm from the Tag).

3.3.3.4.1 Test Sequence No 1: Type 4A Tag

Initial Conditions

The tag content should be configured as below:

NFC Type 4A Tag - NFC Tag is personalized with a “SmartPoster” (phone call)

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in NFC read range	If the DUT requests Tag contents to be accepted, the user shall accept this request.
2	DUT → App	The DUT to read the tag content	The tag content is correctly received by the application.
3	User → DUT	Remove the DUT from the read range	None

3.3.3.4.2 Test Sequence No 2: Type 4B Tag

Initial Conditions

The tag content should be configured as below:

NFC Type 4B Tag - NFC Tag is personalized with a “SmartPoster” (email)

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in NFC read range	If the DUT requests Tag contents to be accepted, the user shall accept this request.
2	DUT → App	The DUT to read the tag content	The tag content is correctly received by the application.
3	User → DUT	Remove the DUT from the read range	None

3.3.3.5 NFC Forum Type 1 Tag – Write NFC Tag

Test Purpose

To ensure the DUT allows writing of NFC Forum Type 1 Tag with a URI or Text RTD (Record Type Definition) as specified in NFC Forum Type 1 Tag Operation Specification.

Referenced requirement

TS26_NFC_REQ_034

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to write the specified Tag format. This application is provided with the default DUT software or a reference application is installed

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- Tag empty initialized with Dynamic memory layout
- The DUT is not placed in the Write Range (more than 50cm from the Tag).

3.3.3.5.1 Test Sequence No 1: Dynamic

Initial Conditions

Write the following tag content:

Initial condition for NFC Type 1 Tag - NFC Tag will be personalized with a URI or Text.

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 1 Tag	The DUT writes to NFC Type 1 Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it.	The tag content is correctly written by the DUT. The Tag content is verified independently of the DUT

3.3.3.5.2 Test Sequence No 2: Static

Note: This test case is FFS due to the unknown availability of NFC Type 1 Tag, with static memory layout.

Initial Conditions

Write the following tag content:

Initial Condition for NFC Type 1 Tag - NFC Tag will be personalized with a URI or Text.

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 1 Tag	The DUT writes NFC Type 1 Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.6 NFC Forum Type 2 Tag – Write NFC Tag

Test Purpose

To ensure the DUT allows writing of NFC Forum Type 2 Tag with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 2 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_035
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using the reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to write the specified Tag format. This application is provided with the default DUT software or a reference application is installed

Initial Conditions

- The DUT is powered on

- NFC is enabled in the DUT
- The tag contents shall be configured to perform the test as following:
  - Initial conditions for Test Sequence No #1: Type 2 Tag empty is initialized with Dynamic memory layout
  - Initial conditions for Test Sequence No #2: Type 2 Tag empty is initialized with Static memory layout
- The DUT is not placed in the Write Range (more than 50cm from the Tag).

3.3.3.6.1 Test Sequence No 1: Dynamic

Initial Conditions

Write the following tag content:

NFC Type 2 Tag - NFC Tag will be personalized with a “SmartPoster” (SMS)

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 2 Tag	The DUT writes to NFC Type 2 Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.6.2 Test Sequence No 2: Static

Initial Conditions

Write the following tag content:

NFC Type 2 Tag - NFC Tag will be personalized with a “SmartPoster” (SMS)

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	

Step	Direction	Sequence	Expected Result
2	App → DUT DUT → Tag	Use the application to write to NFC Type 2 Tag	The DUT writes to NFC Type 2 Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.7 NFC Forum Type 3 Tag – Write NFC Tag

Test Purpose

To ensure the DUT allows writing of NFC Forum Type 3 Tag with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 3 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_036
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to write the specified Tag format. This application is provided with the default DUT software or a reference application is installed

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- Tag empty initialized
- The DUT is not placed in the Write Range (more than 50cm from the Tag).

3.3.3.7.1 Test Sequence No 1

Initial Conditions

Write the following tag content:

NFC Type 3 Tag - NFC Tag will be personalized with a “SmartPoster” (SMS Sending)

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 3 Tag	The DUT writes to NFC Type 3 Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.8 NFC Forum Type 4 Tag – Write NFC Tag

Test Purpose

To ensure the DUT allows writing of NFC Forum Type 4A Tag and Type 4B with SmartPoster RTD (Record Type Definition) as specified in NFC Forum Type 4 Tag Operation Specification.

Referenced requirement

- TS26_NFC_REQ_037
- TS26_NFC_REQ_043

Test execution:

- This test case should be executed using reference NFC tag or simulated NFC tag.
- An application is installed on the DUT able to write the specified Tag format. This application is provided with the default DUT software or a reference application is installed

Initial Conditions

- The DUT is powered on
- NFC is enabled in the DUT
- The following tag contents shall be configured to perform the test as following:
  - Initial conditions for Test Sequence No 1: Empty initialized Type 4A Tag
  - Initial conditions for Test Sequence No 2: Empty initialized Type 4B Tag
- The DUT is not placed in the Write Range (more than 50cm from the Tag).

3.3.3.8.1 Test Sequence No 1: Type 4A Tag

Initial Conditions

Write the following tag content:

For NFC Type 4A Tag - NFC Tag is blank and will be personalized with a “SmartPoster” (Browser)

	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 4A Tag.	The DUT writes to NFC Type 4A Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.8.2 Test Sequence No 2: Type 4B Tag

Initial Conditions

Write the following tag content:

For NFC Type 4B Tag - NFC Tag is blank and will be personalized with a “SmartPoster” (Phone Call)

Step	Direction	Sequence	Expected Result
1	User → DUT	Place DUT in the NFC write range	
2	App → DUT DUT → Tag	Use the application to write to NFC Type 4B Tag	The DUT writes to NFC Type 4B Tag.
3	User → DUT	Remove the DUT from the write range	None
4	User	Verify that tag content was written correctly by reading it	The tag content is correctly written by the DUT. The Tag content shall be verified independently of the DUT

3.3.3.9 Distance for NFC Type 1 Tag reading

Test Purpose

This test case verifies the correct interpretation of NFC Type 1 Tag with RTD (Record Type Definition) by the DUT from 0 to 1cm, optional 2 to 4cm

Referenced requirement

- TS26_NFC_REQ_044
- TS26_NFC_REQ_110

Initial Conditions

- Antenna reference point may be marked on the outside of the DUT
- NFC Tags Type 1 with RTD “Text” is available

3.3.3.9.1 Test Sequence No 1: Distance for NFC Type 1 Tag Reading - 0,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.9.2 Test Sequence No 2: Distance for NFC Type 1 Tag Reading - 0,5cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out

Step	Direction	Sequence	Expected Result
3		Place the DUT with the best coupling point at 0,5 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.9.3 Test Sequence No 3: Distance for NFC Type 1 Tag Reading - 1,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 1 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.9.4 Test Sequence No 4: Distance for NFC Type 1 Tag Reading - 2cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 2 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.9.5 Test Sequence No 5: Distance for NFC Type 1 Tag Reading - 3,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 3 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.9.6 Test Sequence No 6: Distance for NFC Type 1 Tag Reading - 4,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 4 cm from the NFC Tag with RTD “Text”	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10 Distance for NFC Type 2 Tag reading

Test Purpose

This test case verifies the correct interpretation of NFC Type 2 Tag with RTD (Record Type Definition) by the DUT from 0 to 1cm, optional 2 to 4cm.

Referenced requirement

- TS26_NFC_REQ_044
- TS26_NFC_REQ_110

Initial Conditions

- Antenna reference point may be marked on the outside of the DUT

- NFC Tags Type 2 with RTD “SmartPoster” (launch browser) is available

3.3.3.10.1 Test Sequence No 1: Distance for NFC Type 2 Tag Reading - 0,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10.2 Test Sequence No 2: Distance for NFC Type 2 Tag Reading - 0,5cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0,5 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10.3 Test Sequence No 3: Distance for NFC Type 2 Tag Reading - 1,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None

Step	Direction	Sequence	Expected Result
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 1 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10.4 Test Sequence No 4: Distance for NFC Type 2 Tag Reading - 2,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 2 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10.5 Test Sequence No 5: Distance for NFC Type 2 Tag Reading - 3,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 3 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.10.6 Test Sequence No 6: Distance for NFC Type 2 Tag Reading - 4,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 4 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11 Distance for NFC Type 3 Tag reading

Test Purpose

This test case verifies the correct interpretation of NFC Type 3 Tag with RTD (Record Type Definition) by the DUT from 0 to 1cm, optional 2 to 4cm

Referenced requirement

- TS26_NFC_REQ_044
- TS26_NFC_REQ_110

Initial Conditions

- Antenna reference point may be marked on the outside of the DUT
- NFC Tags Type 3 with RTD “SmartPoster” (launch browser) is available

3.3.3.11.1 Test Sequence No 1: Distance for NFC Type 3 Tag Reading - 0,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out

Step	Direction	Sequence	Expected Result
3		Place the DUT with the best coupling point at 0 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11.2 Test Sequence No 2: Distance for NFC Type 3 Tag Reading - 0,5cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0,5 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11.3 Test Sequence No 3: Distance for NFC Type 3 Tag Reading - 1,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 1 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11.4 Test Sequence No 4: Distance for NFC Type 3 Tag Reading - 2cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 2 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11.5 Test Sequence No 5: Distance for NFC Type 3 Tag Reading - 3,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 3 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.11.6 Test Sequence No 6: Distance for NFC Type 3 Tag Reading – 4,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out

Step	Direction	Sequence	Expected Result
3		Place the DUT with the best coupling point at 4 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12 Distance for NFC Type 4A Tag reading

Test Purpose

This test case verifies the correct interpretation of NFC Type 4A Tag with RTD (Record Type Definition**)** by the DUT from 0 to 1cm, optional 2 to 4cm

Referenced requirement

- TS26_NFC_REQ_044
- TS26_NFC_REQ_110

Initial Conditions

- Antenna reference point may be marked on the outside of the DUT
- NFC Type 4A Tag with RTD “SmartPoster” (launch browser) is available

3.3.3.12.1 Test Sequence No 1: Distance for NFC Type 4A Tag Reading - 0,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12.2 Test Sequence No 2: Distance for NFC Type 4A Tag Reading - 0,5cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0,5 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12.3 Test Sequence No 3: Distance for NFC Type 4A Tag Reading - 1,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 1 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12.4 Test Sequence No 4: Distance for NFC Type 4A Tag Reading - 2cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 2 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None

Step	Direction	Sequence	Expected Result
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12.5 Test Sequence No 5: Distance for NFC Type 4A Tag Reading - 3,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 3 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.12.6 Test Sequence No 6: Distance for NFC Type 4A Tag Reading – 4,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 4 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13 Distance for NFC Type 4B Tag reading

Test Purpose

This test case verifies the correct interpretation of NFC Type 4B Tag with RTD (Record Type Definition) by the DUT from 0 to 1cm, optional 2 to 4cm

Referenced requirement

- TS26_NFC_REQ_044
- TS26_NFC_REQ_110

Initial Conditions

- Antenna reference point may be marked on the outside of the DUT
- NFC Tags Type 4B with RTD “SmartPoster” (launch browser) is available

3.3.3.13.1 Test Sequence No 1: Distance for NFC Type 4B Tag Reading - 0,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13.2 Test Sequence No 2: Distance for NFC Type 4B Tag Reading - 0,5cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 0,5 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13.3 Test Sequence No 3: Distance for NFC Type 4B Tag Reading - 1,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 1 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13.4 Test Sequence No 4: Distance for NFC Type 4B Tag Reading - 2cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 2 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13.5 Test Sequence No 5: Distance for NFC Type 4B Tag Reading - 3,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None

Step	Direction	Sequence	Expected Result
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 3 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.13.6 Test Sequence No 6: Distance for NFC Type 4B Tag Reading – 4,0cm

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Using **NFC Tag application**, read the tag content	None
2		Remove the NFC Tag from the DUT and close the application **NFC Tag application**	The NFC Tag is read out
3		Place the DUT with the best coupling point at 4 cm from the NFC Tag with RTD “SmartPoster” (launch browser)	None
4		Confirm tag reading	The tag is automatically read and the information retrieved is identical to step 2

3.3.3.14 NFC Type 1 Tag reading performance

Test Purpose

To ensure a tag reading takes 500ms or less on a NFC Type 1 Tag for a Tag message length not exceeding 100 bytes

Referenced requirement

- TS26_NFC_REQ_042

Initial Conditions

RF spy tool able to measure the transaction time.

Time for transaction is measured between:

- The SoF of the first RF command receiving an answer (for ex: Wake Up)
- The EoF of the answer of the last RF command used to read the content.

The way to present the DUT in front of the tag is done in such a way that the number of communication issues is minimized. For the purpose of this testing, tag content exchanged will have a length of 100 bytes.

3.3.3.14.1 Test Sequence No 1

Initial Conditions

NFC Type 1 Tag is personalized with RTD “Text”

Step	Direction	Sequence	Expected Result
1		Start the RF spy	None
2		Read a NFC Type 1 Tag	NFC Tag content is read
3		As soon as the DUT prompts the end user, stop the RF spy	Time for transaction is less than 500ms

3.3.3.15 NFC Type 2 Tag reading performance

Test Purpose

To ensure a tag reading takes 500ms or less on a NFC Type 2 Tag for a Tag message length not exceeding 100 bytes

Referenced requirement

- TS26_NFC_REQ_042

Initial Conditions

RF spy tool able to measure the transaction time.

Time for transaction is measured between:

- The SoF of the first RF command receiving an answer (for ex: Wake Up)
- The EoF of the answer of the last RF command used to read the content.

The way to present the DUT in front of the tag is done in such a way that the number of communication issues is minimized.

For the purpose of this testing, tag content exchanged will have a length of 100 bytes.

3.3.3.15.1 Test Sequence No 1

Initial Conditions

NFC Type 2 Tag is personalized with RTD “SmartPoster” (launch browser)

Step	Direction	Sequence	Expected Result
1		Start the RF spy	None

Step	Direction	Sequence	Expected Result
2		Read a NFC Type 2 Tag	NFC Tag content is read
3		As soon as the DUT prompts the end user, stop the RF spy	Time for transaction is less than 500ms

3.3.3.16 NFC Type 3 Tag reading performance

Test Purpose

To ensure a tag reading takes 500ms or less on a NFC Type 3 Tag for a Tag message length not exceeding 100 bytes

Referenced requirement

- TS26_NFC_REQ_042

Initial Conditions

RF spy tool able to measure the transaction time.

Time for transaction is measured between:

- The SoF of the first RF command receiving an answer (for ex: Wake Up)
- The EoF of the answer of the last RF command used to read the content.

The way to present the DUT in front of the tag is done in such a way that the number of communication issues is minimized.

For the purpose of this testing, tag content exchanged will have a length of 100 bytes.

3.3.3.16.1 Test Sequence No 1

Initial Conditions

NFC Type 3 Tag is personalized with RTD “SmartPoster” (launch browser)

Step	Direction	Sequence	Expected Result
1		Start the RF spy	None
2		Read a NFC Type 3 Tag	NFC Tag content is read
3		As soon as the DUT prompts the end user, stop the RF spy	Time for transaction is less than 500ms

3.3.3.17 NFC Type 4A Tag reading performance

Test Purpose

To ensure a tag reading takes 500ms or less on a NFC Type 4A Tag for a Tag message length not exceeding 100 bytes

Referenced requirement

- TS26_NFC_REQ_042

Initial Conditions

RF spy tool able to measure the transaction time.

Time for transaction is measured between:

- The SoF of the first RF command receiving an answer (for ex: Wake Up)
- The EoF of the answer of the last RF command used to read the content.

The way to present the DUT in front of the tag is done in such a way that the number of communication issues is minimized.

For the purpose of this testing, tag content exchanged will have a length of 100 bytes.

3.3.3.17.1 Test Sequence No 1

Initial Conditions

NFC Type 4A Tag is personalized with RTD “SmartPoster” (launch browser)

Step	Direction	Sequence	Expected Result
1		Start the RF spy	None
2		Read a NFC Type 4A Tag	NFC Tag content is read
3		As soon as the DUT prompts the end user, stop the RF spy	Time for transaction is less than 500ms

3.3.3.18 NFC Type 4B Tag reading performance

Test Purpose

To ensure a tag reading takes 500ms or less on a NFC Type 4B Tag for a Tag message length not exceeding 100 bytes

Referenced requirement

- TS26_NFC_REQ_042

Initial Conditions

RF spy tool able to measure the transaction time.

Time for transaction is measured between:

- The SoF of the first RF command receiving an answer (for ex: Wake Up)
- The EoF of the answer of the last RF command used to read the content.

The way to present the DUT in front of the tag is done in such a way that the number of communication issues is minimized.

For the purpose of this testing, tag content exchanged will have a length of 100 bytes.

3.3.3.18.1 Test Sequence No 1

Initial Conditions

NFC Type 4B Tag is personalized with RTD “SmartPoster” (launch browser)

Step	Direction	Sequence	Expected Result
1		Start the RF spy	None
2		Read a NFC Type 4B Tag	NFC Tag content is read
3		As soon as the DUT prompts the end user, stop the RF spy	Time for transaction is less than 500ms

3.3.3.19 NFC Tag handling during an active data transfer

Test Purpose

To ensure that during an active data transfer (data exchanged over the mobile network) the DUT SHOULD still be able to handle NFC tags accordingly and inform the user of read tags.

Referenced requirement

- TS26_NFC_REQ_034

Initial Conditions

- NFC Forum Type 1 Tag with content as described in Section 2.5.4.5 is available for testing (i.e. vCard, URI or Text).

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has already been established.

Immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier

- Test data with a size of 60k Bytes to induce OTA Load duration in CAT-TP
- Also, the DUT with a test phone number which can be called and permits to maintain the call for several minutes is necessary.
- Prior to this test the device shall have been powered ON and ISO7816 initialization has been completed.

  - Tests shall be made based on the capability of the DUT (Example: For LTE device, test shall use LTE; otherwise, use 3G).

3.3.3.19.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.1	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1 The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of 0xFF)	
5	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the start of the expected data from the server. 91 XX
6		Read a NFC tag	NFC Tag is read
7		Repeat steps 8 to 9 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD – Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
8	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
9	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the remainder of the expected data from the server. 91 XX
10	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	

Step	Direction	Sequence	Expected Result
11	DUT → UICC	TERMINAL RESPONSE: CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as, ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

3.3.3.20 VOID

3.3.3.21 VOID

3.3.3.22 VOID

3.3.3.23 VOID

3.3.3.24 NFC Forum Tag Operation Test Cases

This chapter addresses the inclusion of selected NFC Forum Tag test cases to ensure a device is able to Read and Write to any of the Tags called out in TS.27. Incorporation of these additional NFC Forum test cases improves the depth of coverage for test cases involving reading and writing to tags, checking for supported payload with tags, error redundancy with tags, timing parameters and that a device may work with future Tags used in the current test scenarios.

Test Purpose

To ensure the DUT follows the NFC Forum Specifications for reading and writing to any of the required Tag types.

These tests should be performed prior to Test Cases 3.3.3.1 through 3.3.3.22, which test only the application level of a device's read and write operation.

Referenced requirement

- TS26_NFC_REQ_034
- TS26_NFC_REQ_035
- TS26_NFC_REQ_036
- TS26_NFC_REQ_037

Related Specs/Docs:

NFCForum Test Cases For Type 1 Tag Operation [30]
NFCForum Test Cases For Type 2 Tag Operation [31]
NFCForum Test Cases For Type 3 Tag Operation [32]
NFCForum Test Cases For Type 4 Tag Operation [33]

Test Procedure

The DUT shall pass the Test Cases with ID REQ from the NFC Forum related specs/docs above. The set of applicable test cases is referenced in Annex B.9.

3.3.3.25 NFC Forum Test Cases for Analog

This chapter addresses the inclusion of NFC Forum Test Cases for Analog to ensure interoperability with mobile devices for use with payment transport services. Incorporation of the NFC Forum Analog test cases improves the depth of coverage for test cases involving the operating volume of NFC-A, NFC-B and NFC-F technologies in polling and listening modes.

Referenced requirement

- TS26_NFC_REQ_042

Related Specs/Docs:

- NFCForum-TS-Analog-1.1
- NFC Forum Test Cases for Analog 1.0.04
- NFC Forum Device Requirements_1.3

Test Procedure

The DUT shall pass the Test Cases with ID REQ from the NFC Forum related specs/docs above. The set of applicable test cases is referenced in Annex B.9.2

3.4 Card emulation mode

3.4.1 General overview

This section addresses the requirements for card emulation mode. This includes basic test cases for card emulation in normal mode as well as under different battery modes and distances.

The list of conformance requirements tested within this section is listed in the table in section 3.4.2.

3.4.2 Conformance requirements

TS26_NFC_REQ_020	When the mobile device is automatically switched off, and enters battery low mode, the mobile device SHALL be able to perform 15 transactions in card

	emulation within the following 24 hours
TS26_NFC_REQ_021	NFC transactions SHALL be possible either in battery power off or battery low mode.
TS26_NFC_REQ_026	Card Emulation mode SHALL be enabled as soon as the NFC is turned on.
TS26_NFC_REQ_027	For Card emulation mode the read distance SHALL be in the 0cm – 2cms range for battery operational mode, battery low or power off mode.
TS26_NFC_REQ_157	The device SHALL implement the requirements of the EMV Contactless Communication Protocol Specification, Book D.

3.4.3 Test Cases

3.4.3.1 Card Emulation enabled as soon as NFC hardware is on

Test Purpose

To verify if card emulation mode works on the device as soon as the device is on.

Referenced requirement

- TS26_NFC_REQ_026

Initial Conditions

- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.

3.4.3.1.1 Test Sequence No 1: Card emulation available after boot

Initial Conditions

None.

Step	Direction	Sequence	Expected Result
1	User → DUT DUT → UICC	Power On the DUT and wait until the UICC has completed HCI session initialization	The HCI initialization is performed correctly
2	User → DUT	Enable NFC in the DUT	DUT indicates NFC is on
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	None
4	User → PCD	Power on the field	None

Step	Direction	Sequence	Expected Result
5	PCD → DUT DUT → UICC	Perform the reference transaction using a contactless reader	The reference transaction is performed successfully

3.4.3.1.2 Test Sequence No 2: Card emulation available after reboot

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT DUT → UICC	Power On the DUT and wait until the UICC has completed HCI session initialization	The HCI initialization is performed correctly
2	User → DUT	Enable the NFC on the DUT	None
3	User → DUT	Power off the DUT	None
4	User → DUT	Power on the DUT	None
5	User → DUT	Check that NFC is on	DUT indicates NFC is on
6	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	None
7	User → PCD	Power on the field	None
8	PCD → DUT DUT → UICC	Perform the reference transaction using a contactless reader	The reference transaction is performed successfully

3.4.3.2 NFC during Standby time

Test Purpose

To ensure the NFC transaction in card emulation mode is possible during 24 hours after the DUT automatically switched off due to a low battery level.

DUT SHALL accept 15 correct reference transactions.

Referenced requirement

- TS26_NFC_REQ_020

Initial Conditions

- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.

3.4.3.2.1 Test Sequence No 1

Initial Conditions

The DUT enters Battery Low Mode

Step	Direction	Sequence	Expected Result
1		Execute the reference transaction in loop mode	The DUT must manage the reference transaction 15 times Note: The 15th transaction shall be performed within the last 5 minutes before the expiry of the 24 hours.

3.4.3.3 Verify that device is able to perform Card Emulation Mode A, Card Emulation Mode B and CLT A transaction either in Battery Power Off or Battery Low mode

Test Purpose

To ensure the NFC transaction in card emulation mode is possible in Battery Power off Mode or in Battery Low Mode.

Referenced requirement

- TS26_NFC_REQ_021

Initial Conditions

- **ReferenceApplication.cap** managing the reference transaction with AID_REF selectable into the reference UICC.
- **APDU Application** to send APDUs according to the reference transaction.

3.4.3.3.1 Test Sequence No 1: Card Emulation Mode Type A in Battery Power Off mode

Initial Conditions

The DUT is in Battery Power Off mode.

Step	Direction	Sequence	Expected Result
1		Perform the reference transaction type A using a contactless reader	Verify that the reference transaction is successfully performed

3.4.3.3.2 Test Sequence No 2: Card Emulation Mode Type B in Battery Power Off mode

Initial Conditions

The DUT is in Battery Power Off mode.

Step	Direction	Sequence	Expected Result
1		Perform the reference transaction type B using a contactless reader	Verify that the reference transaction is successfully performed

3.4.3.3.3 Test Sequence No 3: CLT (A) in Battery Power Off mode

FFS

3.4.3.3.4 Test Sequence No 4: Card Emulation Mode Type A in Battery Low Mode

Initial Conditions

- The DUT is in Battery Low mode.

Step	Direction	Sequence	Expected Result
1		Perform the reference transaction type A using a contactless reader	Verify that the reference transaction is successfully performed

3.4.3.3.5 Test Sequence No 5: Card Emulation Mode Type B in Battery Low Mode

Initial Conditions

- The DUT is in Battery Low mode

Step	Direction	Sequence	Expected Result
1		Perform the reference transaction type B using a contactless reader	Verify that the reference transaction is successfully performed

3.4.3.3.6 Test Sequence No 6: CLT (A) in Battery Low Mode

FFS

3.4.3.4 Distance for card emulation

Test Purpose

- To ensure that in card emulation mode, the communication is ok in a range from 0cm to 2cm (antenna side) in Battery Operational Mode

Referenced requirement

- TS26_NFC_REQ_027
- TS26_NFC_REQ_157

Initial Conditions

None

Test Procedure

- Distance for card emulation is tested as part of the test cases referenced in Annex B.2 and tested in 3.5.3.5

3.4.3.5 Distance for card emulation in Battery Power-off Mode (0cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0cm (antenna side) with Battery Power-off Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI Initialization was correctly performed in previous operating session
- NFC is enabled in DUT
- Card emulation is enabled in the DUT
- DUT is in Battery Power-off Mode
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.5.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None

Step	Direction	Sequence	Expected Result
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.6 Distance for card emulation in Battery Power-off Mode (0.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0.5cm (antenna side) with Battery Power-off Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.
- DUT is in Battery Power-off Mode.
- **ReferenceApplication.cap** managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.6.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.7 Distance for card emulation in Battery Power-off Mode (1cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1cm (antenna side) with Battery Power-off Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT
- DUT is in Battery Power-off Mode
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.7.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.8 Distance for card emulation in Battery Power-off Mode (1.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1.5cm (antenna side) with Battery Power-off Mode.

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT

- Card emulation is enabled in the DUT
- DUT is in Battery Power-off Mode
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.8.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.9 Distance for card emulation in Battery Power-off Mode (2cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 2cm (antenna side) with Battery Power-off Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT
- DUT is in Battery Power-off Mode
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 2cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.9.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.10 Distance for card emulation in Battery Power-low Mode (0cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0cm (antenna side) with Battery Power-low Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.
- DUT is in Battery Power-low Mode.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.10.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None

Step	Direction	Sequence	Expected Result
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.11 Distance for card emulation in Battery Power-low Mode (0.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0.5cm (antenna side) with Battery Power-low Mode.

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.
- DUT is in Battery Power-low Mode
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.11.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.12 Distance for card emulation in Battery Power-low Mode (1cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1cm (antenna side) with Battery Power-low Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation for is enabled in the DUT.
- DUT is in Battery Power-low Mode.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.12.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.13 Distance for card emulation in Battery Power-low Mode (1.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1.5cm (antenna side) with Battery Power-low Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.

- DUT is in Battery Power-low Mode.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.13.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.14 Distance for card emulation in Battery Power-low Mode (2cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 2cm (antenna side) with Battery Power-low Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- HCI initialization was correctly performed in previous operating session
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.
- DUT is in Battery Power-low Mode.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 2cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.14.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.15 Distance for card emulation in Battery Power-operational Mode (0cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0cm (antenna side) with Battery Power-operational Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- DUT is powered on and the DUT is in Battery Power-operational Mode
- HCI initialization is correctly performed.
- NFC is enabled in the DUT.
- Card emulation is enabled in the DUT.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.15.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.16 Distance for card emulation in Battery Power-operational Mode (0.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 0.5cm (antenna side) with Battery Power-operational Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- DUT is powered on and the DUT is in Battery Power-operational Mode
- HCI initialization is correctly performed.
- NFC is enabled in the DUT.
- Card emulation is enabled in the DUT.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 0.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.16.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.17 Distance for card emulation in Battery Power-operational Mode (1cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1cm (antenna side) with Battery Power-operational Mode.

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- DUT is powered on and the DUT is in Battery Power-operational Mode
- HCI initialization is correctly performed.
- NFC is enabled in the DUT.
- Card emulation is enabled in the DUT.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.17.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.18 Distance for card emulation in Battery Power-operational Mode (1.5cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 1.5cm (antenna side) with Battery Power-operational Mode.

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- DUT is powered on and the DUT is in Battery Power-operational Mode.
- HCI initialization is correctly performed.
- NFC is enabled in the DUT.
- Card emulation is enabled in the DUT.
- **ReferenceApplication.cap** managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 1.5cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.18.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.4.3.19 Distance for card emulation in Battery Power-operational Mode (2cm)

Test Purpose

To ensure that in card emulation mode, the communication is ok at 2cm (antenna side) with Battery Power-operational Mode

Referenced requirement

- TS26_NFC_REQ_027

Initial Conditions

- DUT is powered on and the DUT is in Battery Power-operational Mode
- HCI initialization is correctly performed
- NFC is enabled in the DUT
- Card emulation is enabled in the DUT.
- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- While the field is off, the DUT is set to 2cm of the reference contactless reader at the best coupling point between DUT and contactless reader. In order to support testing - the antenna reference point may be marked on the DUT.

3.4.3.19.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → PCD	Power on the field	None

Step	Direction	Sequence	Expected Result
2	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully

3.5 Core and Common features

3.5.1 General overview

This section addresses the requirements for the core NFC controller and for the common functions between Reader/Writer and Card emulation mode. This also includes the SWP/HCI and RF protocol compliance.

The list of conformance requirements tested within this section is listed in the table in section 3.5.2.

3.5.2 Conformance requirements

TS26_NFC_REQ_006	The NFC controller SHALL support SWP (Single Wire Protocol) interface with the UICC as per ETSI TS 102.613.
TS26_NFC_REQ_007	The NFC controller SHALL support HCI with the UICC as per ETSI TS 102.622.
TS26_NFC_REQ_008	Contactless tunnelling (CLT=A) mode SHALL be supported for SWP (per ETSI TS 102.613).
TS26_NFC_REQ_009.1	Contactless tunnelling (CLT=F) mode SHALL be supported for SWP (per ETSI TS 102 613).
TS26_NFC_REQ_010	The device interface with UICC SHOULD support Class B.
TS26_NFC_REQ_011	The device interface with UICC SHALL support Class C.
TS26_NFC_REQ_014	The device interface with UICC SHALL support DEACTIVATED followed by subsequent SWP interface activation in full power mode.
TS26_NFC_REQ_015	The NFC controller SHOULD support both windows size set to 3 and set to 4.
TS26_NFC_REQ_025	The mobile device SHALL support Card-emulation as per NFC Forum TS-Analog, TS-Digital and TS-Activity Specifications.
#TS26_NFC_REQ_033	The mobile device SHALL support Reader/Writer Mode as per NFC Forum TS-Analog, TS-Digital and TS-Activity Specifications.
TS26_NFC_REQ_041	The device SHALL support automatic and continuous switching between card emulation and reader mode.

Note: # - This indicates the requirement is still work in progress according to TS.26 NFC Handset Requirements

3.5.3 Test Cases

3.5.3.1 SWP Compliance testing

Test Purpose

To ensure the device conforms to Single Wire Protocol specification

Referenced requirement

- TS26_NFC_REQ_006
- TS26_NFC_REQ_008
- TS26_NFC_REQ_009.1
- TS26_NFC_REQ_010
- TS26_NFC_REQ_011
- TS26_NFC_REQ_014
- TS26_NFC_REQ_015

Method of Test

Related Specs/Docs: ETSI TS 102.613 |9]

Test Procedure

The DUT shall pass all applicable test cases referenced in Annex B.4 and in Table 15, Table 16.

3.5.3.2 HCI Compliance testing

Test Purpose

To ensure the device conforms to Host Controller Interface specification

Referenced requirement

- TS26_NFC_REQ_007

Related Specs/Docs: ETSI TS 102 622 [10]

Test Procedure

The DUT shall pass all applicable test cases referenced in B.5, Table 17 and Table 18.

3.5.3.3 SWP Stress test

Test Purpose

To ensure the DUT manages 100 transactions consecutively

Referenced requirement

- TS26_NFC_REQ_006

Initial Conditions

- The DUT is powered on
- HCI initialization has been performed successfully.
- NFC is enabled on the DUT
- Card Emulation is enabled in the DUT

- **ReferenceApplication.cap** managing the reference transaction with AID_REF selectable into the reference UICC.
- **APDU Application** to send APDUs according to the reference transaction.

3.5.3.3.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	None
2	User → PCD	Power on the field	None
3	PCD → DUT DUT → UICC	Execute the **reference transaction** in loop mode (100 loops)	The reference transaction is performed correctly 100 times consecutively.

3.5.3.4 Switch mode

Test Purpose

To ensure the DUT is able to automatically and continuously switch between card emulation mode and reader emulation mode.

Referenced requirement

- TS26_NFC_REQ_041

Initial Conditions

- The DUT is on
- HCI initialization has been correctly performed
- UICC application with AID01 selectable
- A Type 1 Tag with the RTD “Text” content
- The Tag and the reader are separated by at least 50cm
- The NFC is enabled

3.5.3.4.1 Test Sequence No 1

Initial Conditions

Backlight is on. DUT not locked.

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1		Place the DUT in front of the Tag to read	Tag reading ok
2		Set the DUT in front of the contactless reader then send a SELECT_BY_DF_name AID01	**APDU application** receives Status word 90 00
3		Place the DUT in front of the Tag to read	Tag reading ok
4		Set the DUT in front of the contactless reader then send a SELECT_BY_DF_name AID01	**APDU application** receives Status word 90 00
5		Place the DUT in front of the Tag to read	Tag reading ok
6		Set the DUT in front of the contactless reader then send a SELECT_BY_DF_name AID01	**APDU application** receives Status word 90 00
7		Place the DUT in front of the Tag to read	Tag reading ok
8		Set the DUT in front of the contactless reader then send a SELECT_BY_DF_name AID01	**APDU application** receives Status word 90 00
9		Place the DUT in front of the Tag to read	Tag reading ok
10		Set the DUT in front of the contactless reader then send a SELECT_BY_DF_name AID01	**APDU application** receives Status word 90 00

3.5.3.5 RF Protocol compliance

Test Purpose

To ensure that a mobile device is compliant with NFCForum-TS-Analog-1.1, NFC Forum-TS-Digital-Protocol-1.0 and NFCForum-TS-Activity-1.0 specifications for card and reader emulation modes.

Referenced requirement

- TS26_NFC_REQ_025
- TS26_NFC_REQ_033

Related Specs/Docs: NFC Forum-TS-Analog-1.1, NFC Forum-TS-Digital Protocol-1.0, NFC Forum-TS-Activity-1.0

Test Procedure

The DUT shall pass all the test cases referenced in annex B.2.

3.5.3.6 VOID

4 VOID

5 Secure Element Access Control

5.1 General overview

This chapter addresses the implementation of the Secure Element Access Control mechanism according to the GlobalPlatform Secure Element Access Control [7] standard. It will grant or refuse the communication to/from applets stored in the UICC SE.

The list of conformance requirements tested within this section is listed in the table in section 5.2.

Note: The current version of this test book covers usage of Access Rule Files in some selected aspects.

5.2 Conformance requirements

TS26_NFC_REQ_082	Open OS devices SHALL provide access control as per GlobalPlatform, Secure Element Access Control specification.
TS26_NFC_REQ_083	When no access control data (files or applets) is found on the Active UICC Profile the API SHALL deny access to the Active UICC Profile.
TS26_NFC_REQ_150.1	When several activities registered for the “EVT_TRANSACTION”, the framework SHALL follow the priority scheme described below: 1. “Android:priority” level defined in the Intent Filter SHALL be compared **2.** First installed application package (APK) has a higher priority

5.3 Test Cases

Following initial conditions are applicable for all SE Access Control tests in this section, unless it is otherwise specified for a particular test case.

General Initial Conditions

Two instances of the UICC application **APDU_TestApplication.cap** with AID01 and AID02 are selectable.

For that purpose, **MobileApplication** is registered for EVT_TRANSACTION handling from AID01 and AID02 and implements the functions “Select AID01” and “Select AID02” as it is specified in section 2.

The application is duplicated with different signature configurations as it is specified in section 2 and respectively named:

- GSMA_AC_Mobile_App_SP1_signed
- GSMA_AC_Mobile_App_SP2_signed

Note1: GSMA_AC_Mobile_App_SP1_signed is installed first.

Note2: Steps performed through the contactless interface (e.g. step 17 and 25 in Test Sequence 1) ensure for each test that the application on the mobile is correctly triggered by an NFC event.

Initial state: Power off RF field and no applications should be started manually on the DUT. APDU_TestApplication.cap is not selected on UICC.

5.3.1 GP SE Access Control

Test Purpose

To ensure the Open OS device provide API for Access Control as per Global Platform Specification GPD_SE_Access_Control for:

Secure Element Access API
NFC Event

Referenced requirement

- TS26_NFC_REQ_082
- TS26_NFC_REQ_083
- TS26_NFC_REQ_150.1

5.3.1.1 Test Sequence No 1: Single app access to all AIDs

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF (Application Dedicated File) with a DODF (Data Object Directory File) present and valid
- an ACMF (Access Control Main File) is present and valid
- an ACRF (Access Control Rules File) is present and valid and contains a rule for “all other AIDs” (a rule for all Secure Element applications that are not explicitly protected by a specific rule) and a path for one ACCF containing SP1 hash condition

  ⇨ SP1 has full access to all AIDs

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.16, 5.4.29.2 and 5.4.27.1 provide test steps that are now similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	SELECT command is successful and call to "Select AID01" function returns successfully

Step	Direction	Sequence	Expected Result
3		Call "Select AID02" function	SELECT command is successful and call to "Select AID02" function returns successfully
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD->DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP1_signed** is launched

5.3.1.2 Test Sequence No 2: All apps access to single AID

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF. The ACCF is present and contains no hash condition (access allowed for mobile apps)

  ⇨ AID01 is always accessible, no access allowed for any other AID

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.10 provides test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is successful
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD->DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.1.3 Test Sequence No 3: All apps access to all AIDs

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a rule for all other AIDs and a path for one ACCF. The ACCF is present and contains no hash condition (access allowed for mobile apps)

⇨ all applications have full access to all AIDs

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.22 provides test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is successful
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is successful
7		Call "Select AID02" function	Call is successful
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD-> DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	

Step	Direction	Sequence	Expected Result
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP1_signed** is launched

5.3.1.4 Test Sequence No 4: Single app access to single AID

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing SP1 hash condition

⇨ only access to AID01 by SP1 is allowed

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.2 and 5.4.27.1 provide test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted

Step	Direction	Sequence	Expected Result
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD-> DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.1.5 Test Sequence No 5: Multiple apps access to single AID, single ACCF, installation order

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains
  - one specific target rule for AID01 and a path for one ACCF containing SP1 hash condition
  - one specific target rule for AID01 and a path for one ACCF containing SP2 hash condition

⇨ only access to AID01 by SP1 and SP2 is allowed

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.8 and 5.4.27.1 provide test

steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is successful
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT- >UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched (first installed application)
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.1.6 Test Sequence No 6: Multiple apps access to single AID, separate ACCFs, installation order

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
  - an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing SP1 hash condition and SP2 hash condition.

⇨ SP1 and SP2 can access AID01 only

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.31.3 provides test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in a later version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is successful
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT- >UICC	Send EVT_FIELD_OFF	

Step	Direction	Sequence	Expected Result
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched (first installed application)
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		Repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.1.7 Test Sequence No 7: Multiple apps access to all AIDs, installation order

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains
  - one rule “8200” and a path for one ACCF containing SP1 hash condition
  - one rule “8200” and a path for one ACCF containing SP2 hash condition

⇨ SP1 and SP2 have full access to all AIDs

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.29.10 provides test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is successful
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is successful
7		Call "Select AID02" function	Call is successful

Step	Direction	Sequence	Expected Result
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT- >UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched (first installed application)
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		Repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP1_signed** is launched

5.3.1.8 Test Sequence No 8: Single app access to multiple AIDs

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains
  - one specific target rule for AID01 and a path for one ACCF containing SP1 hash condition
  - one specific target rule for AID02 and a path for the same ACCF

⇨ SP1 has access to AID01 and AID02

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is successful

Step	Direction	Sequence	Expected Result
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT- >UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		Repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP1_signed** is launched

5.3.1.9 Test Sequence No 9: Single app access to single AID, further empty ACCF rule

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains
  - one specific target rule for AID01 and a path for one ACCF containing SP1 hash condition

- one specific target rule for AID01 and a path for one ACCF. The ACCF contains no hash condition (access allowed for mobile apps)

⇨ only access to AID01 by SP1 is allowed

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.32.2 provides test steps that are similar to steps 1 to 8 of this test case. Redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT- >UICC	Send EVT_FIELD_OFF	

Step	Direction	Sequence	Expected Result
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		Repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.2 GP SE Access Control - Refresh tag

Test Purpose

To ensure the DUT does not read all the Access Control rules when the refresh tag is not set.

Referenced requirement

- TS26_NFC_REQ_082
- TS26_NFC_REQ_083

Initial Conditions

- An instance of the UICC application **APDU_TestApplication.cap** with AID01 is selectable.
- **MobileApplication** is installed on the DUT and implements a function “Select AID01”.
- The application is signed with test certificate SP1 (**GSMA_Mobile_App_SP1_signed).**

5.3.2.1 Test Sequence No 1: Refresh tag not updated, refresh tag updated

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing an empty hash condition

⇨ only access to AID01 is allowed

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1		Using the **MobileApplication**, select AID01	Call is successful
2		Start the ISO7816 spy	
3		Using the **MobileApplication**, select AID01	Call is successful
4		Stop the spy.	The log can be used to verify whether the DUT checks the "refresh tag". If after reading the PKCS#15 structure, a logical channel has been opened then check the DUT closes the logical channel at the end of the reading. The whole content of the PKCS#15 is not read.
5		Change the UICC configuration with the following: PKCS#15 ADF with a DODF present and valid an ACMF is present and valid an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing an entry with a corrupted certificate (wrong length) The reference PKCS#15 structure is in Annex E.	
6		Start the ISO7816 spy	
7		Using the **MobileApplication**, select AID01	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Stop the spy.	

5.3.2.2 Test Sequence No 2: Device rebooted

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing an empty hash condition

⇨ only access to AID01 is allowed

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1		Using the **MobileApplication**, select AID01	Call is successful
2		Switch off the DUT	
3		Start the ISO7816 spy	
4		Switch on the DUT	
5		Using the **MobileApplication**, select AID01	Call is successful
6		Stop the spy.	The log can be used to verify whether the DUT read the whole content during the first access to the PKCS#15 content.

5.3.3 GP SE Access Control – ADF_PKCS#15 and DF PKCS#15

Test Purpose

To ensure the DUT correctly manages card configuration with a PKCS#15 ADF selectable and another DF PKCS#15 available in EF_DIR

Referenced requirement

- TS26_NFC_REQ_082

Initial Conditions

Only the following versions of the MobileApplication are used for these tests:

- GSMA_AC_Mobile_App_SP1_signed
- GSMA_AC_Mobile_App_SP2_signed

5.3.3.1 Test Sequence No 1

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing a SP1 hash condition
  - EF_DIR contains a reference to PKCS#15 DF structure containing a specific target rule for AID02 and a path for one ACCF containing a SP2 hash condition

⇨ only access to AID01 by SP1 is allowed

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.4 GP SE Access Control – PKCS#15 selection via EF_DIR

Test Purpose

To ensure the DUT correctly manages card configuration without PKCS#15 AID. According to GP specification, if the selection of the PKCS#15 AID fails, the DUT selects the EF_DIR to locate a PKCS#15 DF

Referenced requirement

- TS26_NFC_REQ_082

Initial Conditions

Only the following versions of the MobileApplication are used for these tests:

- GSMA_AC_Mobile_App_SP1_signed
- GSMA_AC_Mobile_App_SP2_signed

5.3.4.1 Test Sequence No 1

Initial Conditions for test #1

The following configuration is loaded into the UICC:

- ADF PKCS#15 is absent
- EF_DIR contains a reference to PKCS#15 DF structure containing a specific target rule for AID01 and a path for one ACCF containing a SP1 hash condition

⇨ only access to AID01 by SP1 is allowed

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted

Step	Direction	Sequence	Expected Result
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		repeat steps 9 to 15 with AID02 instead of AID01	No application is triggered

5.3.5 GP SE Access Control – Configuration limits

Test Purpose

To ensure the DUT correctly manages card configuration with large contents.

Referenced requirement

- TS26_NFC_REQ_082

Initial Conditions

Only the following versions of the MobileApplication are used for these tests:

- **GSMA_AC_Mobile_App_SP1_signed**
- **GSMA_AC_Mobile_App_SP2_signed**

5.3.5.1 Test Sequence No 1: Many hash conditions

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains

- one specific target rule for AID01 and a path for one ACCF containing 10 dummy hash conditions and a SP1 hash condition
- one specific target rule for AID02 and a path for one ACCF containing 10 dummy hash conditions and a SP2 hash condition

⇨ access to AID01 by SP1 is allowed – access to AID02 by SP2 is allowed

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.31.1 provide test steps that are similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is successful
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	

Step	Direction	Sequence	Expected Result
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close GSMA_AC_Mobile_App_SP1_signed	
16		Repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP2_signed** is launched

5.3.5.2 Test Sequence No 2: Many rules

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains
- one specific target rule for AID01 and a path for one ACCF containing 1 dummy hash condition and a SP1 hash condition
- one specific target rule for AID02 and a path for one ACCF containing 1 dummy hash condition and a SP2 hash condition
- 48 rules “A0XX04XX[dummy AIDs]” and a path for one ACCF containing 2 dummy hash conditions

- access to AID01 by SP1 is allowed – access to AID02 by SP2 is allowed

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform – SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.31.2 provide test steps that are similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch GSMA_AC_Mobile_App_SP1_signed	
2		Call "Select AID01" function	Call is successful
3		Call "Select AID02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
4		Close GSMA_AC_Mobile_App_SP1_signed	

Step	Direction	Sequence	Expected Result
5		Launch GSMA_AC_Mobile_App_SP2_signed	
6		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
7		Call "Select AID02" function	Call is successful
8		Close GSMA_AC_Mobile_App_SP2_signed	
9	PCD	Power on RF field	
10	PCD-> DUT	Perform RF protocol initialisation	
11	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
12	PCD	Power off RF field	
13	DUT->UICC	Send EVT_FIELD_OFF	
14		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**GSMA_AC_Mobile_App_SP1_signed** is launched
15		Close **GSMA_AC_Mobile_App_SP1_signed**	
16		Repeat steps 9 to 15 with AID02 instead of AID01	**GSMA_AC_Mobile_App_SP2_signed** is launched

5.3.6 GP SE Access Control – No access

Test Purpose

To ensure the DUT denies the access to

- Secure Element Access API
- NFC Event when no PKCS#15 structure is available

Referenced requirement

- TS26_NFC_REQ_083

Initial Conditions

An instance of the UICC application **APDU_TestApplication.cap** with AID01 is selectable.

For that purpose, **MobileApplication** is registered for EVT_TRANSACTION handling from AID01 and implements a function “Select AID01”.

The application is signed with test certificate SP1 (**GSMA_AC_Mobile_App_SP1_signed).**

5.3.6.1 Test Sequence No 1: PKCS#15 ADF absent

Initial Conditions

The following configuration is loaded into the UICC:

- ADF PKCS#15 is absent
- EF_DIR does not contain references to PKCS#15 structure

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.1.2 provide test steps that are similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch **GSMA_AC_Mobile_App_SP1_signed**	
2		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
3		Close **GSMA_AC_Mobile_App_SP1_signed**	
4	PCD	Power on RF field	
5	PCD-> DUT	Perform RF protocol initialisation	
6	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
7	PCD	Power off RF field	
8	DUT->UICC	Send EVT_FIELD_OFF	
9		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	No application is triggered

5.3.6.2 Test Sequence No 2: ACRF absent

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- ACRF is absent

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.1.9 provide test steps that are similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		**Launch GSMA_AC_Mobile_App_SP1_signed**	
2		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
3		Close **GSMA_AC_Mobile_App_SP1_signed**	
4	PCD	Power on RF field	
5	PCD-> DUT	Perform RF protocol initialisation	
6	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
7	PCD	Power off RF field	
8	DUT->UICC	Send EVT_FIELD_OFF	
9		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	No application is triggered

5.3.6.3 Test Sequence No 3: ACRF empty

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- ACRF is present but without any rule entry

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.1.14 provide test steps that are similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch **GSMA_AC_Mobile_App_SP1_signed**	
2		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
3		Close **GSMA_AC_Mobile_App_SP1_signed**	
4	PCD	Power on RF field	
5	PCD-> DUT	Perform RF protocol initialisation	
6	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
7	PCD	Power off RF field	
8	DUT- >UICC	Send EVT_FIELD_OFF	
9		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	No application is triggered

5.3.6.4 Test Sequence No 4: Corrupted certificate, wrong length

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing an entry with a corrupted certificate (wrong length)

The reference PKCS#15 structure is in Annex E.

Note: Annex B.8 of this document lists the test cases from the GlobalPlatform - SEAC DeviceSide Test Plan [27]. Test cases referenced as 5.4.1.16 provide test steps that are

similar to steps 1 to 8 of this test case. For a sake of clarity, redundancies will be handled in the next version of this Test Book.

Step	Direction	Sequence	Expected Result
1		Launch **GSMA_AC_Mobile_App_SP1_signed**	
2		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
3		Close **GSMA_AC_Mobile_App_SP1_signed**	
4	PCD	Power on RF field	
5	PCD-> DUT	Perform RF protocol initialisation	
6	PCD->DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
7	PCD	Power off RF field	
8	DUT->UICC	Send EVT_FIELD_OFF	
9		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	No application is triggered

5.3.6.5 Test Sequence No 5: Corrupted certificate, invalid content

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a specific target rule for AID01 and a path for one ACCF containing an entry with a corrupted certificate (original ACCF padded with two 0x00 bytes)

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1		Launch **GSMA_AC_Mobile_App_SP1_signed**	

Step	Direction	Sequence	Expected Result
2		Call "Select AID01" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted
3		Close **GSMA_AC_Mobile_App_SP1_signed**	
4	PCD	Power on RF field	
5	PCD-> DUT	Perform RF protocol initialisation	
6	PCD->DUT	Start **APDU application** by sending a SELECT command with AID01	**APDU Application** receives Status Word 90 00
7	PCD	Power off RF field	
8	DUT->UICC	Send EVT_FIELD_OFF	
9		The **APDU_TestApplication.cap** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	No application is triggered

5.4 GP SE Access Control – GP Test Plan

Test Purpose

To ensure the device provide API for Access Control as per Global Platform Specification GPD_SE_Access_Control

Referenced requirement

- TS26_NFC_REQ_082
- TS26_NFC_REQ_083

Related Specs/Docs: GlobalPlatform - SEAC DeviceSide Test Plan [27]

The DUT shall pass the Test Cases with ID REQ from GlobalPlatform - SEAC DeviceSide Test Plan [27], the set of applicable test cases is referenced in Annex B.1.

6 Secure Element Access API

6.1 General overview

This chapter addresses the implementation of the Mobile Device APIs according to the SIMalliance Open Mobile API specification or equivalent. The objective is to verify mobile applications can access different Secure Elements in a mobile device such as SIMs.

The list of conformance requirements tested within this section is listed in the table in section 6.2.

6.2 Conformance requirements

TS26_NFC_REQ_047	OS implementations SHALL provide an API for communicating with the Active UICC Profile.
TS26_NFC_REQ_047.1	Communication with the Active UICC Profile SHALL be done through the logical channels.
TS26_NFC_REQ_047.2	Communication with the Active UICC Profile SHALL prevent access to basic channel (channel 0).
TS26_NFC_REQ_047.3	The API SHALL implement the SIMalliance Open Mobile API transport layer or provide an equivalent set of features. Note: SIMalliance OMAPI specification v3.2 does not define values for EventTypes. This is a known issue and is expected to be addressed in a future version of the SIMalliance OMAPI specification. For implementations based on the current version of TS.26, the following values SHALL be used for EventTypes: Reader:IOErrorEventType = (int) 0x1001 Reader:SEInsertedEventType = (int) 0x2001 Reader:SERemovalEventType = (int) 0x2002 It is anticipated that a future version of the SIMalliance OMAPI specification will use the same values as specified above.

6.3 Test Cases

6.3.1 SIMalliance APIs

Test Purpose

To ensure the DUT follows the SIMalliance specification for the Transport API part of the Open Mobile API.

Referenced requirement

- TS26_NFC_REQ_047
- TS26_NFC_REQ_047.1
- TS26_NFC_REQ_047.3

Related Specs/Docs: SIMalliance - Open Mobile API specification [6]

The DUT shall pass the test cases referenced in annex B.1

6.3.2 Prevent access to basic channel.

Test Purpose

APDU APIs SHALL prevent access to basic channel (channel 0).

Referenced requirement

- TS26_NFC_REQ_047.2

Method of Test

For devices supporting the Open Mobile API, the DUT shall pass the Test Case ID7 in Clause 6.4.6 from Open Mobile API test specification, the full set of applicable test cases is referenced in Annex B.1.

6.3.3 VOID

6.3.4 VOID

6.3.5 VOID

7 Multiple Card Emulation Environment

7.1 General overview

This chapter addresses the requirements for Multiple Card Emulation Environment support when the device has the capacity to handle further Secure Elements to the UICC.

The list of conformance requirements tested within this section is listed in the table in section 7.2.

7.2 Conformance requirements

TS26_NFC_REQ_051	The mobile device software platform SHOULD expose an API to select and switch the Active CEE. A change in the Active CEE selection SHALL not imply a power cycle of the device, modem or the UICC.
TS26_NFC_REQ_065	The device SHALL provide a routing mechanism using the following priority: AID, then default AID route, then RF protocol and then RF technology.
TS26_NFC_REQ_068	The device SHALL provide a mechanism to handle AID Conflict.
TS26_NFC_REQ_068.02	When managing AIDconflict resolution, the device SHALL follow the end-user preferences.
TS26_NFC_REQ_116	The OS implementation SHALL provide an API that allows an application to enable & disable Card Emulation Mode.
TS26_NFC_REQ_117	In Multiple Active CEE model, the UICC SHALL be one of the active CEEs.
TS26_NFC_REQ_118.1	At first power up or factory reset the device SHALL set the route for NFCA and NFCB technologies (as defined in NFC Forum specification) to the UICC.
TS26_NFC_REQ_118.2	At first power up or factory reset the device SHALL set the route for ISO_DEP protocol (as defined in NFC Forum specification) to the UICC.
TS26_NFC_REQ_162.1	The default AID route SHALL be independent of any other routes configured in the NFC controller (such as those for RF Protocol (for example: ISO_DEP, T1t, T2t, T3t) or RF Technology (for example: NFC A, NFC B, NFC F))

7.3 Test Cases

7.3.1 VOID

7.3.2 SE selection

Test Purpose

Check the DUT allows selecting the SE available over the contactless interface

Referenced requirement

- TS26_NFC_REQ_051

Test execution:

This test case should be executed for all SE's other than the UICC.

Initial Conditions

- **ReferenceApplication.cap** is installed with AID_REF on the UICC
- **APDU Application** to send APDUs according to the reference transaction.

No application with AID_REF is installed on the other SE.

7.3.2.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	PCD → DUT	Using the **APDU application,** perform the reference transaction	Reference transaction is performed successfully
2	App → DUT	Select the other SE using the API for selecting the Active CEE.	API call is successful
3	PCD → DUT	Using the **APDU application,** perform the reference transaction	Reference transaction fails (at the application selection).
4	App → DUT	Select the UICC using the API for selecting the Active CEE.	API call is successful. The DUT doesn't power cycle the DUT, the modem or the UICC
5	PCD → DUT	Using the **APDU application,** perform the reference transaction	Reference transaction is performed successfully

7.3.3 VOID

7.3.4 VOID

7.3.5 VOID

7.3.6 Switch for Card Emulation Mode

Test Purpose

Test that in Single Active Card Emulation Environment, there is an OS API that allows for enabling & disabling of Card Emulation Mode.

Referenced requirement

- TS26_NFC_REQ_116

Initial Conditions

- ReferenceApplication.cap is installed
- APDU Application to send APDUs according to the reference transaction.

7.3.6.1 Test Sequence No 1

Initial Conditions

- NFC is enabled
- No AIDs are registered in the CLF routing table
- The active SE is the UICC
- The mobile application must be signed with one of the certificates stored in the PKCS#15 topology of the UICC

Step	Direction	Sequence	Expected Result
1		Call the API to enable Card Emulation Mode	
2		Using the **APDU application,** perform the reference transaction while the device and screen is on	Reference Transaction is passed.
3		Call the API to disable Card Emulation Mode	
4		Using the **APDU application,** perform the reference transaction while device and screen is on.	Reference transaction performed unsuccessfully

7.3.7 Multiple CE Environments

Test Purpose

Check the UICC is an active Card Emulation Environment in Multiple Card Emulation Environments models.

Referenced requirement

- TS26_NFC_REQ_068
- TS26_NFC_REQ_068.1
- TS26_NFC_REQ_117

Initial Conditions

- The DUT is powered on
- HCI initialization has been performed successfully
- NFC is enabled in the DUT
- No applications should be started manually on the DUT
- ReferenceApplication.cap for managing the reference transaction with AID_REF is installed and selectable on the UICC
- APDU Application to send APDUs according to the reference transaction.
- No off_host_apdu_service and/or host_apdu_service shall be registered with AID_REF in the CLF routing table.

7.3.7.1 Test Sequence No 1: Default route UICC, contactless session with unregistered AID

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- In the NFC Controller the default AID route is set to UICC (see section 2.6.1)
- The AID_REF is not registered.

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT DUT → UICC	Execute the reference transaction	Reference transaction is performed successfully with UICC as CEE.

7.3.7.2 Test Sequence No 2: Default route HCE, contactless session with unregistered AID

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- In the NFC Controller the default AID route is set to HCE (see section 2.6.1)
- The AID_REF is not registered.

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT DUT → UICC	Execute the **reference transaction**	The DUT returns SW indicating error code on the select AID command. No APDU shall be forwarded to the UICC.

7.3.7.3 Test Sequence No 3: Default route UICC, off-host AID

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “other”.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to UICC (see section 2.6.1). .	
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
4	PCD	Power on RF field	
5	PCD → DUT	Perform RF protocol initialisation	
6	PCD → DUT DUT → UICC	Execute the reference transaction For AID_REF	Reference transaction is performed successfully with UICC as CEE.

7.3.7.4 Test Sequence No 4: Default route HCE, off-host AID

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “other”.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to HCE. (see section 2.6.1)	
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
4	PCD	Power on RF field	

Step	Direction	Sequence	Expected Result
5	PCD → DUT	Perform RF protocol initialisation	
6	PCD → DUT DUT → UICC	Execute the reference transaction for AID_REF.	Reference transaction is performed successfully with UICC as CEE.

7.3.7.5 Test Sequence No 5: Default route UICC, AID conflict, off-host service selected

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “other”.
- App02: an android application which registers in its Manifest a host_apdu_service (HCE) for AID_REF and specifies the category as “other”. This App manages the reference transaction.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to UICC. (see section 2.6.1)	
3	User → DUT	Install App02	The application is installed successfully
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	None
5	PCD	Power on RF field	
6	PCD → DUT	Perform RF protocol initialisation	
7	PCD → DUT DUT → UICC	Execute the **reference transaction**	- Reference transaction fails - the DUT shall prompt the user with a pop-up, asking to select the desired application (Conflict of AIDs as the same AID is registered towards both UICC and HCE)

Step	Direction	Sequence	Expected Result
8	User → DUT	Select App01	
9	PCD	Power off RF field	
10	PCD	Power on RF field	
11	PCD → DUT	Perform RF protocol initialisation	
12	PCD → DUT DUT → UICC	Execute the **reference transaction** for AID.	Reference transaction is performed successfully with UICC as CEE.

7.3.7.6 Test Sequence No 6: Default route HCE, AID conflict, off-host service selected

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “other”.
- App02: an android application which registers in its Manifest a host_apdu_service (HCE) for AID_REF and specifies the category as “other”. This App manages the reference transaction.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to HCE. (see section 2.6.1)	
3	User → DUT	Install App02	The application is installed successfully
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
5	PCD	Power on RF field	
6	PCD → DUT DUT → UICC	Perform RF protocol initialisation	

Step	Direction	Sequence	Expected Result
7	PCD → DUT DUT → UICC	Execute the **reference transaction**	) Reference transaction fails) the DUT shall prompt the user with a pop-up, asking to select the desired application (Conflict of AIDs as the same AID is registered towards both UICC and HCE)
8	User → DUT	Select App01	
9	User → PCD	Power off the field	
10	User → PCD	Power on the field	
11	PCD → DUT DUT → UICC	Start card emulation session	Contactless Session is started
12	PCD → DUT DUT → UICC	Execute the **reference transaction** for AID_REF.	**Reference transaction** is performed successfully with UICC as CEE.

7.3.7.7 Test Sequence No 7: Default route UICC, off-host service selected in Tap&Pay

Initial Conditions

) All NFC applications on the DUT are uninstalled except applications that are preinstalled|
) App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “payment”.|
) App02: an android application which registers in its Manifest at the host_apdu_service (HCE) for AID_REF and specifies the category as “payment”. This App manages the reference transaction.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01.	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to UICC. (see section 2.6.1)	

Step	Direction	Sequence	Expected Result
3	User → DUT	Install App02	The application is installed successfully
4	User → DUT	Select App01 in the Tap&Pay menu	App01 is selected as Tap&Pay.
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
6	PCD	Power on RF field	
7	PCD → DUT	Perform RF protocol initialisation	
8	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully with UICC as CEE. The DUT shall NOT prompt the user with a pop-up.

7.3.7.8 Test Sequence No 8: Default route HCE, off-host service selected in Tap&Pay

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “payment”.
- App02: an android application which registers in its Manifest a host_apdu_service (HCE) for AID_REF and specifies the category as “payment”. This App manages the reference transaction.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to HCE. (see section 2.6.1)	
3	User → DUT	Install App02	The application is installed successfully
4	User → DUT	Select the App01 in the Tap&Pay menu	App01 is selected as Tap&Pay.
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	

Step	Direction	Sequence	Expected Result
6	PCD	Power on RF field	
7	PCD → DUT	Perform RF protocol initialisation	
8	PCD → DUT DUT → UICC	Execute the **reference transaction**	**Reference transaction** is performed successfully with UICC as CEE. DUT shall NOT prompt the user with a pop-up.

7.3.7.9 Test Sequence No 9: Default route UICC, HCE service selected in Tap&Pay

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “payment”.
- App02: an android application which registers in its Manifest a host_apdu_service (HCE) for AID_REF and specifies the category as “payment”. This App manages the reference transaction

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to UICC. (see section 2.6.1)	
3	User → DUT	Install App02.	The application is installed successfully
4	User → DUT	Select App02 in the Tap&Pay menu	App02 is selected as Tap&Pay.
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
6	PCD	Power on RF field	
7	PCD → DUT	Perform RF protocol initialisation	
8	PCD → DUT DUT → UICC	Execute the **reference transaction** For AID_REF	**Reference transaction** is performed successfully with HCE as CEE. The DUT shall NOT prompt the user with a pop-up, since the HCE applet will answer to the AID Select.

7.3.7.10 Test Sequence No 10: Default route HCE, HCE service selected in Tap&Pay

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- App01: an android application which registers in its Manifest an off_host_apdu_service for AID_REF and specifies the category as “payment”.
- App02: an Android application which registers in its Manifest a host_apdu_service (HCE) for AID_REF and specifies the category as “payment”. This App manages the reference transaction

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	In the NFC Controller set the default AID route to HCE. (see section 2.6.1)	The default Card Emulation Environment is now HCE.
3	User → DUT	Install App02.	The application is installed successfully
4	User → DUT	Select App02 in the Tap&Pay menu	App02 is selected as Tap&Pay.
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
6	PCD	Power on RF field	
7	PCD → DUT	Perform RF protocol initialisation	
8	PCD → DUT DUT → UICC	Execute the reference transaction For AID_REF	Reference transaction is performed successfully with HCE as CEE. The DUT shall NOT prompt the user with a pop-up, since the HCE applet will answer to the AID Select.

7.3.8 Active Card Emulation in Multiple CE Environments / Card Emulation

Test Purpose

Test that after initial power up or factory reset NFC communication is routed to the UICC by default.

Referenced requirement

- TS26_NFC_REQ_065
- TS26_NFC_REQ_118.1
- TS26_NFC_REQ_118.2
- TS26_NFC_REQ_162.1

7.3.8.1 VOID

7.3.8.2 Test Sequence No 2: REQ_065 for NFCA

Initial Conditions

- The NFC reader is polling in type A only or provide a mechanism to make sure the NFC transaction will be performed using RF type A.
- The default AID route is set to HCE (see section 2.6.1)
- The routing table of the CLF contains an entry for an Applet identified by [AID01] and route for AID01 is set to UICC
- Install an Applet with [AID01] on the UICC implementing External Authenticate according to Annex A.4.4.

Step	Direction	Sequence	Expected Result
1		Use a contactless reader to explicitly select this Applet by AID01	Status Word 90 00 is received by the contactless reader
2		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using the contactless reader	Status Word 90 00 is received by the contactless reader

7.3.8.3 Test Sequence No 3: REQ_118.2 for NFCA

Initial Conditions

- If the phone supports a mechanism to change the default technology, protocol or Default AID route, then do a factory reset before the test
- The NFC reader is polling in type A only or provide a mechanism to make sure the NFC transaction will be performed using RF type A.
- Install an applet on the UICC implementing External Authenticate according to Annex A.4.4, implicitly selectable via NFCA. Note: The reader shall not explicitly select the Applet by AID
- The default AID route is set to UICC (see section 2.6.1)

Step	Direction	Sequence	Expected Result
1		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using a contactless reader Note: The reader shall access the applet without explicitly selecting it by AID.	Status Word 90 00 is received by the contactless reader

7.3.8.4 Test Sequence No 4: REQ_118.2 for NFCB

Initial Conditions

- If the phone supports a mechanism to change the default technology, protocol or Default AID route, then do a factory reset before the test

- The NFC reader is polling in type B only or provide a mechanism to make sure the NFC transaction will be performed using RF type B.
- Install an applet on the UICC implementing External Authenticate according to Annex A.4.4, implicitly selectable via NFCB. Note: The reader shall not explicitly select the Applet by AID
- The default AID route is set to UICC (see section 2.6.1)

Step	Direction	Sequence	Expected Result
1		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using a contactless reader Note: The reader shall access the applet without explicitly selecting it by AID.	Status Word 90 00 is received by the contactless reader

7.3.8.5 Test Sequence No 5: REQ_118.1 and REQ_162.1 for NFCA

Initial Conditions

- If the phone supports a mechanism to change the default technology, protocol or Default AID route, then do a factory reset before the test
- The NFC reader is polling in type A only or provide a mechanism to make sure the NFC transaction will be performed using RF type A.
- The NFC reader is establishing an ISO 14443-3 communication over type A.
- Install an Applet on the UICC, to handle CLT=A mode or use an intrinsic UICC mechanism (e.g. MIFARE Classic)
- The default AID route is set to HCE (see section 2.6.1)

Step	Direction	Sequence	Expected Result
1		Use a contactless reader to exchange command with this applet while remaining at ISO 14443-3 communication level (e.g. a MIFARE classic reader).	Status Word 90 00 is returned

7.3.8.6 Test Sequence No 6: REQ_065 for NFCB

Initial Conditions

- The NFC reader is polling in type B only or provide a mechanism to make sure the NFC transaction will be performed using RF type B.
- Install an Applet with [AID01] on the UICC implementing External Authenticate according to Annex A.4.4
- The default AID route is set to HCE (see section 2.6.1)
- The routing table of the CLF contains an entry with [AID01] and route for AID01 is set to UICC

Step	Direction	Sequence	Expected Result
1		Use a contactless reader to explicitly select this Applet by its AID	Status Word 90 00 is received by the contactless reader
2		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using a contactless reader	Status Word 90 00 is received by the contactless reader

7.3.8.7 VOID

7.3.8.8 VOID

7.3.8.9 Test Sequence No 9: REQ_118.2 and REQ_162.1 for NFCA

Initial Conditions

- If the phone supports a mechanism to change the default technology, protocol or Default AID route, then do a factory reset before this test.
- The NFC reader is polling in type A only or provide a mechanism to make sure the NFC transaction will be performed using RF type A.
- Install an Applet on the UICC implementing External Authenticate according to Annex A.4.4, implicitly selectable via NFCA. Note: The reader shall not explicitly select the Applet by AID.
- The default AID route is set to HCE (see section 2.6.1.)

Step	Direction	Sequence	Expected Result
1		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using a contactless reader Note: The reader shall access the applet without explicitly selecting it by AID.	Status Word 90 00 is received by the contactless reader

7.3.8.10 Test Sequence No 10: REQ_118.2 and REQ_162.1 for NFCB

Initial Conditions

- If the phone supports a mechanism to change the default technology, protocol or Default AID route, then do a factory reset before this test.
- The NFC reader is polling in type B only or provide a mechanism to make sure the NFC transaction will be performed using RF type B.
- Install an Applet on the UICC implementing External Authenticate according to Annex A.4.4, implicitly selectable via NFCB. Note: The reader shall not explicitly select the Applet by AID.
- The default AID route is set to HCE (see section 2.6.1.)

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1		Send EXTERNAL AUTHENTICATE (acc to Annex A.4.4) using a contactless reader Note: The reader shall access the applet without explicitly selecting it by AID.	Status Word 90 00 is received by the contactless reader

8 UI Application triggering

8.1 General overview

This chapter addresses the UI application triggering. The aim is to ensure the NFC controller is able to trigger the appropriate UI application.

The list of conformance requirements tested within this section is listed in the table in section 8.2.

8.2 Conformance requirements

<table>
<tr><td>TS26_NFC_REQ_069</td><td>For UICC, Secure Element Name SHALL be SIM[smartcard slot] (e.g. SIM/SIM1, SIM2… SIMn).</td></tr>
<tr><td>TS26_NFC_REQ_071</td><td>The device SHALL support HCI event EVT_TRANSACTION as per ETSI TS 102 622</td></tr>
<tr><td>TS26_NFC_REQ_072</td><td>The OS implementation SHALL provide a mechanism to inform authorised OS applications of Transaction Events and this SHALL include the Secure Element name and the AID of the applet which triggered the transaction and PARAMETERS holding the payload conveyed by the HCI EVT_TRANSACTION event.</td></tr>
<tr><td>TS26_NFC_REQ_096</td><td>Transaction event data SHALL be set in the following extended field:
<table><tr><td>com.gsma.services.nfc.extra.AID
ByteArray</td><td>Contains the card “Application Identifier” [optional]</td></tr><tr><td>com.gsma.services.nfc.extra.DATA
ByteArray</td><td>Payload conveyed by the HCI event “EVT_TRANSACTION”</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_129</td><td>A Transaction Event (EVT_TRANSACTION) SHALL be triggered based on the following information:
<table><tr><td>Action</td><td>com.gsma.services.nfc.action.TRANSACTION_EVENT</td></tr><tr><td>Mime type</td><td>-</td></tr><tr><td>URI</td><td>nfc://secure:0/<SEName>/<AID>
- SEName reflects the originating SE It must be compliant with SIMalliance Open Mobile API
- AID reflects the originating UICC applet identifier</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_131</td><td>The device SHALL request the following permission for receiving a Transaction event:
<table><tr><td>NFC Controller</td><td>android.permission.NFC</td></tr><tr><td>Transaction Event</td><td>com.gsma.services.nfc.permission.TRANSACTION_EVENT</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_150</td><td>In “Unicast” mode, “EVT_TRANSACTION” event SHALL be received by only one activity.</td></tr>
</table>

TS26_NFC_REQ_150.1	When several activities registered for the “EVT_TRANSACTION”, the framework SHALL follow the priority scheme described below: 1. “Android:priority” level defined in the Intent Filter SHALL be compared 2. First installed application package (APK) has a higher priority

8.3 Test Cases

8.3.1 EVT_TRANSACTION

Test Purpose

To ensure the DUT correctly handles the EVT_TRANSACTION event as per the ETSI 102 622 [10] specification

Referenced requirement

- TS26_NFC_REQ_071

Initial Conditions

Related Specs/Docs: ETSI TS 102 622 [10]

The DUT shall pass the Test Case 5.8.2.3.5.2 from ETSI TS 102 695-1, the full set of applicable test cases is referenced in Annex B4.

8.3.2 Permissions

Test Purpose

To ensure the DUT correctly manages the Android mechanism of permissions relative to NFC.

Referenced requirement

- TS26_NFC_REQ_131

Initial Conditions

The application is registered for EVT_TRANSACTION handling from AID01 with *com.gsma.services.nfc.action.TRANSACTION_EVENT*

8.3.2.1 Test Sequence No 1: NFC and TRANSACTION_EVENT declared

Initial Conditions

The following permission is declared in the Mobile Application manifest:

android.permission.NFC

com.gsma.services.nfc.permission.TRANSACTION_EVENT

Step	Direction	Sequence	Expected Result
1	User → DUT	Install the Android application	DUT shall prompt the user to authorize the application installation indicating the NFC permission

8.3.2.2 Test Sequence No 2: NFC not declared, TRANSACTION_EVENT declared

Initial Conditions

The following permission is declared in the Mobile Application manifest:

com.gsma.services.nfc.permission.TRANSACTION_EVENT

The following permission is NOT declared in the Mobile Application manifest:

android.permission.NFC

Step	Direction	Sequence	Expected Result
1	User → DUT	Install the Android application	DUT does not require the user to authorize the NFC permission

8.3.2.3 Test Sequence No 3: NFC declared, TRANSACTION_EVENT not declared

Initial Conditions

The following permission is declared in the Mobile Application manifest:
android.permission.NFC

The following permission is NOT declared in the Mobile Application manifest:
com.gsma.services.nfc.permission.TRANSACTION_EVENT

Step	Direction	Sequence	Expected Result
1	User → DUT	Install the Android application	DUT shall prompt the user to authorize the application installation indicating the NFC permission.

8.3.3 Intent management

Test Purpose

To ensure the DUT correctly manages the Android mechanism of intents.

Referenced requirement

- TS26_NFC_REQ_069
- TS26_NFC_REQ_096
- TS26_NFC_REQ_129

Initial Conditions

- The DUT is powered on
- HCI initialization has been performed successfully
- NFC is enabled in the DUT
- Three instances of the UICC application APDU_TestApplication.cap with AID01, AID02 and AID03 are selectable.
- The mobile application is registered for EVT_TRANSACTION handling from AID01 and AID02 with com.gsma.services.nfc.action.TRANSACTION_EVENT
- No applications should be started manually on the DUT

8.3.3.1 Test Sequence No 1: EVT_TRANSACTION, no data

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	Application is triggered and receives the transaction event and URI format is the following: - nfc://secure:0/SE_Name/AID with - AID equals to AID01 - SE_Name according to SIMalliance open mobile API specification
8	App → DUT	Open OMAPI session with the reader named “SE_NAME” returned in step 6	Session is opened successfully
9	DUT→ UICC	Call the “Select AID01” function	Application with AID01 is selected

Step	Direction	Sequence	Expected Result
10	DUT → UICC	Send **APDU Case 4** P1 = 0x00 'XX 04 01 00 FF' <Data field of 255 bytes> FF)	Expected response returned from "SE_Name" is: R-APDU – data field of 255 bytes, SW1, SW2

8.3.3.2 Test Sequence No 2: EVT_TRANSACTION, with data

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID02	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID02 with data (0x20 bytes long)	Application is triggered and receives the transaction event with additional data (0x20 bytes long). The URI format is the following: - nfc://secure:0/SE_Name/AID with - AID equals to AID02 SE_Name according to SIMalliance open mobile API specification - received data retrieved from com.gsma.services.nfc.extra.DATA
8	App → DUT	Open OMAPI session with the reader named "SE_NAME" returned in step 6	Session is open successfully
9	DUT→ UICC	Call the "Select AID02" function	Application with AID02 is selected and SW 90 00 is returned by SE_Name

Step	Direction	Sequence	Expected Result
10	DUT → UICC	Send **APDU Case 4** P1 = 0x01 'XX 04 01 00 FF' <Data field of 255 bytes> FF)	Expected response returned from reader "SE_Name" is: R-APDU – data field of 255 bytes, SW1, SW2

8.3.3.3 Test Sequence No 3: EVT_TRANSACTION, application not registered for AID

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID03	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID03	Application doesn't receive the transaction event

8.3.4 Application's triggering order

Test Purpose

Check the launch, and order of launch of the applications; check that for the same HCI_Event, which calls 2 applications, only the first installed one answers, and that no application is launched when an event does not refer to any AID.

Referenced requirement

- TS26_NFC_REQ_150
- TS26_NFC_REQ_150.1

Initial Conditions

- The DUT is powered on
- HCI initialization has been performed successfully
- NFC is enabled in the DUT
- Install GSMA_Mobile_App_UIA #1 first

- **GSMA_Mobile_App_UIA #1** signed with a private key corresponding to test certificate #1 defined to be woken up on HCI Events from AID01 and AID02

Install **GSMA_Mobile_App_UIA #2**

- **GSMA_Mobile_App_UIA_#2** signed with a private key corresponding to test certificate #2

defined to be woken up on HCI Events from AID02

Three instances of the **APDU_TestApplication.cap** (respectively with AID01, AID02 and AID03).

- No applications should be started manually on the DUT

8.3.4.1 Test Sequence No 1: First installed application triggered

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a rule for all other AIDs and a path for one ACCF containing an empty hash condition

⇨ all applications have full access to all AIDs
The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	**GSMA_Mobile_App_UIA_#1** is launched
8	User → DUT	Close the application **GSMA_Mobile_App_UIA_#1**	Application is closed

Step	Direction	Sequence	Expected Result
9	User → DUT	Repeat steps 2 – 5	
10	UICC → DUT	UICC sends EVT_TRANSACTION with AID02	**GSMA_Mobile_App_UIA_#1** is launched
11	User → DUT	Close the application **GSMA_Mobile_App_UIA_#1**	Application is closed
12	User → DUT	Repeat steps 2 – 5	
13	UICC → DUT	UICC sends EVT_TRANSACTION with AID03	No mobile application is launched

8.3.4.2 Test Sequence No 2: Different AID

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a rule for all other AIDs and a path for one ACCF containing an empty hash condition

⇨ all applications have full access to all AIDs

Install another **GSMA_Mobile_App_UIA_#3**

- **GSMA_Mobile_App_UIA_#3** signed with a private key corresponding to test certificate #1 defined to be woken up on HCI Events from all AIDs

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT->UICC	Send EVT_FIELD_OFF	
7		UICC sends EVT_TRANSACTION with AID01	**GSMA_Mobile_App_UIA_#1** is launched

Step	Direction	Sequence	Expected Result
8	User → DUT	Close the application **GSMA_Mobile_App_UIA_#1**	Application is closed
9	User → DUT	Repeat steps 2 – 5	
10	UICC → DUT	UICC sends EVT_TRANSACTION with AID02	**GSMA_Mobile_App_UIA_#1**is launched
11	User → DUT	Close the application **GSMA_Mobile_App_UIA_#1**	Application is closed
12	User → DUT	Repeat steps 2 – 5	
13	UICC → DUT	UICC sends EVT_TRANSACTION with AID03	**GSMA_Mobile_App_UIA_#3**is launched

8.3.4.3 Test Sequence No 3: Single application has SEAC access

Initial Conditions

The following configuration is loaded into the UICC:

- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a rule for all other AIDs and a path for one ACCF containing SP2 hash condition

⇨ SP2 has full access to all AIDs

The reference PKCS#15 structure is in Annex E.

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	No mobile application is launched
8	User → DUT	Repeat steps 2 – 5	

Step	Direction	Sequence	Expected Result
9	UICC → DUT	UICC sends EVT TRANSACTION with AID02	**GSMA_Mobile_App_UIA_#2** is launched
10	User → DUT	Close the application **GSMA_Mobile_App_UIA_#2**	Application is closed
11	User → DUT	Repeat steps 2 – 5	
12	UICC → DUT	UICC sends EVT TRANSACTION with AID03	No mobile application is launched

8.3.5 Triggering on HCI event EVT_CARD_DEACTIVATED

Test Purpose

To ensure the device is able to launch the mobile application on EVT_TRANSACTION when a HCI EVT_CARD_DEACTIVATED event is processed by the CLF.

Referenced requirement

- TS26_NFC_REQ_071
- TS26_NFC_REQ_072

Initial Conditions

- The DUT is powered on
- HCI initialisation has been performed successfully
- NFC is enabled in the DUT
- **APDU_TestApplication_card_deactivated** is installed on the UICC and is selectable with AID01
- **MobileApplication** is installed on the DUT and is launched on EVT_TRANSACTION from AID01
- No applications should be started manually on the DUT.

8.3.5.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	None
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	

Step	Direction	Sequence	Expected Result
4	PCD → DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD → DUT	The **APDU application** sends a contactless DESELECT	None
6	DUT → UICC	The DUT sends EVT_CARD_DEACTIVED	None
7	UICC → DUT	UICC sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	MobileApplication is launched and the intent received indicates reception of EVT_TRANSACTION with AID01

8.3.6 Triggering on HCI event EVT_FIELD_OFF

Test Purpose
To ensure the device is able to launch the mobile application on EVT_TRANSACTION when a HCI EVT_FIELD_OFF event is processed by the CLF.

Referenced requirement
- TS26_NFC_REQ_071
- TS26_NFC_REQ_072

Initial Conditions
- The DUT is powered on
- HCI initialization has been performed successfully
- NFC is enabled in the DUT
- APDU_TestApplication is installed on the UICC and is selectable with AID01
- MobileApplication is installed on the DUT and is launched on EVT_TRANSACTION from AID01
- No applications should be started manually on the DUT.
- APDU_TestApplication is not selected on UICC.

8.3.6.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	None
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00

Step	Direction	Sequence	Expected Result
5	PCD	Power off RF field	
6	DUT → UICC	Send EVT_ FIELD_OFF	
7	UICC → DUT	The **UICC** sends EVT_TRANSACTION to **GSMA_AC_Mobile_App_SP1_signed**	**MobileApplication** is launched and the intent received indicates the reception of EVT_TRANSACTION with AID01

9 VOID

10 VOID

11 Mobile Device APN management

11.1 General overview

This chapter addresses the APN management by the device according to ETSI specifications.

The list of conformance requirements tested within this section is listed in the table in section 11.2.

11.2 Conformance requirements

TS26_NFC_REQ_075	For mobile devices supporting multiple APNs, the device SHALL be able to set-up an Active UICC Profile OTA channel using the APN information that is provided in the OPEN CHANNEL command.
TS26_NFC_REQ_076	For devices which are configured as "Always-ON" and only support a single APN, the APN information provided in the OPEN CHANNEL command SHALL be ignored and the device SHALL use the device default APN.
TS26_NFC_REQ_077	If the APN information provided by the network in the OPEN CHANNEL command is empty the device SHALL always use the device default APN.

11.3 Test Cases

11.3.1 OPEN CHANNEL

Test Purpose

To verify OPEN CHANNEL related to Default APN Always

Referenced requirement

- TS26_NFC_REQ_075
- TS26_NFC_REQ_076
- TS26_NFC_REQ_077

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

11.3.1.1 Test Sequence No 1: (OPEN CHANNEL - Default APN Always-ON - Multiple APN supported - with different APN)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.1.1	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.1.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 11.1.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: GPRS/UTRAN packet service/ E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

Network access name (APN):web99.test-nfc1.com

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 11.1.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status: Channel identifier 1 and link established or PDP context activated

Bearer Description:

Bearer type: GPRS/UTRAN packet service/ E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer size 1024

11.3.1.2 Test Sequence No 2: (OPEN CHANNEL - Default APN Always–ON - Only Single APN supported - with different APN)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.2.1	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.2.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.2.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 11.2.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: GPRS/UTRAN packet service/ E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size:	1024
Network access name (APN):	web99.test-nfc1.com

UICC/ME interface transport level

Transport format:	UDP
Port number:	44444
Data destination address	01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 11.2.1

Logically:

Command details

Command number:	1
Command type:	OPEN CHANNEL
Command qualifier:	immediate link establishment

Device identities

Source device:	ME
Destination device:	UICC

Result

General Result:	Command performed successfully
Channel status:	Channel identifier 1 and link established or PDP context activated

Bearer Description:

Bearer type:	GPRS/UTRAN packet service/ E-UTRAN
Bearer parameter:	
Precedence Class:	02
Delay Class:	04
Reliability Class:	02
Peak throughput class:	05
Mean throughput class:	31
Packet data protocol:	02 (IP)

Buffer

Buffer size	1024

11.3.1.3 Test Sequence No 3: (OPEN CHANNEL - Default APN Always-ON - APN empty)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.3.1	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.3.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.3.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 11.3.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: GPRS/UTRAN packet service/ E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 11.3.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: GPRS/UTRAN packet service/ E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

11.3.1.4 Test Sequence No 4: (OPEN CHANNEL - Default APN Always-ON - APN empty- Default Bearer Type used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.4.1	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.4.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.4.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 11.4.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer Type

Buffer

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 11.4.1

Logically:

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel status Channel identifier 1 and link established or PDP context activated
Bearer description
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024

11.3.2 CLOSE CHANNEL

Test Purpose

To verify CLOSE CHANNEL related to Default APN Always-ON

Referenced requirement

- TS26_NFC_REQ_075
- TS26_NFC_REQ_076
- TS26_NFC_REQ_077

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

11.3.2.1 Test Sequence No 1: (CLOSE CHANNEL - Default APN Always-ON - Multiple APN supported - with different APN- SUCCESSFUL)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.1.1	See OPEN CHANNEL SEQ 11.1.1

Step	Direction	Sequence	Expected Result
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.1.1	
5	ME → USER	The ME may display channel opening information	
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.1.1	[Command performed successfully]
9	UICC → ME	PROACTIVE COMMAND: PENDING CLOSE CHANNEL 11.1.1	
10	ME → UICC	FETCH	
11	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 11.1.1	
12	ME → USS	PDP context deactivation request	
13	USS → ME	PDP context deactivation accept	
14	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 11.1.1	[Command performed successfully]

PROACTIVE COMMAND: CLOSE CHANNEL 11.1.1

Logically:

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

TERMINAL RESPONSE: CLOSE CHANNEL 1.1

Logically:

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

11.3.2.2 Test Sequence No 2: (CLOSE CHANNEL - Default APN Always–ON - Only Single APN supported - with different APN- SUCCESSFUL)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.2.1	Please See OPEN CHANNEL SEQ 11.2.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.2.1	
5	ME → USER	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.2.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 11.1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 11.1.1	
11	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 11.1.1	[Command performed successfully]

11.3.2.3 Test Sequence No 3: (CLOSE CHANNEL - Default APN Always-ON - APN empty- SUCCESSFUL)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.3.1	See OPEN CHANNEL SEQ 11.3.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.3.1	
5	ME → USER	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.3.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 11.1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 11.1.1	
11	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 11.1.1	[Command performed successfully]

11.3.2.4 Test Sequence No 4: (CLOSE CHANNEL - Default APN Always-ON - APN empty- SUCCESSFUL- Default Bearer Type Used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC →ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.4.1	See OPEN CHANNEL SEQ 11.4.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.4.1	
5	ME → USER	The ME may display channel opening information	
6	ME →USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.4.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 11.1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 11.1.1	
11	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 11.1.1	[Command performed successfully]

11.3.3 RECEIVE DATA

Test Purpose

To verify RECEIVE DATA related to Default APN Always-ON

Referenced requirement

- TS26_NFC_REQ_075
- TS26_NFC_REQ_076
- TS26_NFC_REQ_077

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

11.3.3.1 Test Sequence No 1: (RECEIVE DATA - Default APN Always-ON - Multiple APN supported - with different APN)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.1.1	See OPEN CHANNEL SEQ 11.1.1
7	ME → UICC	FETCH	
8	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.1.1	
9	ME → User	The ME may display channel opening information	
10	ME → USS	PDP context activation request	
11	USS → ME	PDP context activation accept	
12	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.1.1	[Command performed successfully]
13	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
14	ME → UICC	FETCH	
15	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.1	
16	ME → USS	Transfer of 8 Bytes of data to the USS through channel 1	[To retrieve ME’s port number]
17	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.1	[Command performed successfully]

Step	Direction	Sequence	Expected Result
18	USS → ME	Transfer of 1024 Bytes of data to the M' through channel 1 using the ME's port number, which was retrieved in step 16	
19	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 11.1.1	(1024 Bytes of data in the ME buffer)
20	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.1	
21	ME → UICC	FETCH	
22	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.1	205 Bytes
23	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.1	
24	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.2	
25	ME → UICC	FETCH	
26	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.2	205 Bytes
27	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.2	
28	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.3	
29	ME → UICC	FETCH	
30	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.3	205 Bytes
31	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.3	
32	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.4	
33	ME → UICC	FETCH	
34	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.4	205 Bytes
35	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.4	
36	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.5	
37	ME → UICC	FETCH	

Step	Direction	Sequence	Expected Result
38	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.5	204 Bytes
39	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.5	

PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1

Logically:

Command details
- Command number: 1
- Command type: SET UP EVENT LIST
- Command qualifier: RFU

Device identities
- Source device: UICC
- Destination device: ME

Event list: Data available

TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1

Logically:

Command details
- Command number: 1
- Command type: SET UP EVENT LIST
- Command qualifier: RFU

Device identities
- Source device: ME
- Destination device: UICC

Result
- General Result: Command performed successfully

PROACTIVE COMMAND: SEND DATA 11.1.1

Logically:

Command details
- Command number: 1
- Command type: SEND DATA
- Command qualifier: Send Immediately

Device identities
- Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 11.1.1

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

ENVELOPE: EVENT DOWNLOAD - Data available 11.1.1

Logically:

Event list

Event: Data available

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: FF (more than 255 bytes are available)

PROACTIVE COMMAND: RECEIVE DATA 11.1.1

Logically:

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 11.1.2

Logically:

Command details

Command number: 2

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 11.1.3

Logically:

Command details

Command number: 3

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 11.1.4

Logically:

Command details

Command number: 4

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 11.1.5

Logically:

Command details

Command number: 5

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 204

TERMINAL RESPONSE: RECEIVE DATA 11.1.1

Logically:

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: 00 01 02 .. CC (205 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 11.1.2

Logically:

Command details

Command number: 2

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: CD CE CF .. FF 00 01 .. 99(205 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 11.1.3

Logically:

Command details

Command number: 3

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: 9A 9B .. FF 00 01 – 66 (205 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 11.1.4

Logically:

Command details

Command number: 4

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : 67 68 .. FF 00 01 .. 33 (205 Bytes of data)

Channel data length: CC

TERMINAL RESPONSE: RECEIVE DATA 11.1.5

Logically:

Command details

Command number: 5

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel Data: 34 35 .. FF (204 Bytes of data)
Channel data length: 00

11.3.3.2 Test Sequence No 2: (RECEIVE DATA - Default APN Always–ON - Only Single APN supported - with different APN)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.2.1	See OPEN CHANNEL SEQ 11.2.1
7	ME → UICC	FETCH	
8	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.2.1	
9	ME → User	The ME may display channel opening information	
10	ME → USS	The terminal shall not send a PDP context activation request	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.2.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
13	ME → UICC	FETCH	

Step	Direction	Sequence	Expected Result
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.1	
15	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.1	[Command performed successfully]
17	USS → ME	Transfer 1024 Bytes of data to the ME through channel 1 using the ME's port number, which was retrieved in step 15	
18	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 11.1.1	(1024 Bytes of data in the ME buffer)
19	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.1	
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.1	205 Bytes
22	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.1	
23	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.2	
24	ME → UICC	FETCH	
25	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.2	205 Bytes
26	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.2	
27	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.3	
28	ME → UICC	FETCH	
29	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.3	205 Bytes
30	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.3	
31	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.4	
32	ME → UICC	FETCH	
33	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.4	205 Bytes

Step	Direction	Sequence	Expected Result
34	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.4	
35	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.5	
36	ME → UICC	FETCH	
37	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.5	204 Bytes
38	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.5	

11.3.3.3 Test Sequence No 3: (RECEIVE DATA - Default APN Always-ON - APN empty)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.3.1	See OPEN CHANNEL SEQ 11.3.1
7	ME → UICC	FETCH	
8	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.3.1	
9	ME → User	The ME may display channel opening information	
10	ME → USS	The terminal shall not send a PDP context activation request	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.3.1	[Command performed successfully]

Step	Direction	Sequence	Expected Result
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.1	
15	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.1	[Command performed successfully]
17	USS → ME	Transfer 1024 Bytes of data to the ME through channel 1 using the ME's port number, which was retrieved in step 15	
18	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 11.1.1	(1024 Bytes of data in the ME buffer)
19	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.1	
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.1	205 Bytes
22	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.1	
23	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.2	
24	ME → UICC	FETCH	
25	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.2	205 Bytes
26	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.2	
27	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.3	
28	ME → UICC	FETCH	
29	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.3	205 Bytes
30	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.3	
31	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.4	

Step	Direction	Sequence	Expected Result
32	ME → UICC	FETCH	
33	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.4	205 Bytes
34	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.4	
35	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.5	
36	ME → UICC	FETCH	
37	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.5	204 Bytes
38	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.5	

11.3.3.4 Test Sequence No 4: (RECEIVE DATA - Default APN Always-ON - APN empty-Default Bearer Type used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.4.1	See OPEN CHANNEL SEQ 11.4.1
7	ME → UICC	FETCH	
8	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.4.1	
9	ME → User	The ME may display channel opening information	

Step	Direction	Sequence	Expected Result
10	ME → USS	The terminal shall not send a PDP context activation request	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.4.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.1	
15	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.1	[Command performed successfully]
17	USS → ME	Transfer 1024 Bytes of data to the ME through channel 1 using the ME's port number, which was retrieved in step 15	
18	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 11.1.1	(1024 Bytes of data in the ME buffer)
19	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.1	
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.1	205 Bytes
22	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.1	
23	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.2	
24	ME → UICC	FETCH	
25	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.2	205 Bytes
26	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.2	
27	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.3	
28	ME → UICC	FETCH	
29	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.3	205 Bytes

Step	Direction	Sequence	Expected Result
30	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.3	
31	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.4	
32	ME → UICC	FETCH	
33	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.4	205 Bytes
34	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.4	
35	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 11.1.5	
36	ME → UICC	FETCH	
37	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 11.1.5	204 Bytes
38	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 11.1.5	

11.3.4 SEND DATA

Test Purpose

To verify SEND DATA related to Default APN Always-ON

Referenced requirement

- TS26_NFC_REQ_075
- TS26_NFC_REQ_076
- TS26_NFC_REQ_077

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

11.3.4.1 Test Sequence No 1: (SEND DATA - Default APN Always-ON - Multiple APN supported - with different APN - BUFFER FULLY USED)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.

Step	Direction	Sequence	Expected Result
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.1.1	See OPEN CHANNEL SEQ 11.1.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.1.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.1.1	[Command performed successfully]
9	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
10	ME → UICC	FETCH	
11	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.1	Send 1024 Bytes of data by packet of 200 Bytes
12	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.1	[Command performed successfully]
13	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.2	
14	ME → UICC	FETCH	
15	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.2	[205 Bytes]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.2	[Command performed successfully]
17	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.3	
18	ME → UICC	FETCH	
19	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.3	[205 Bytes]
20	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.3	[Command performed successfully]
21	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.4	

Step	Direction	Sequence	Expected Result
22	ME → UICC	FETCH	
23	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.4	[205 Bytes]
24	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.4	[Command performed successfully]
25	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.5	
26	ME → UICC	FETCH	
27	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.5	[204 Bytes]
28	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	
29	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.5	[Command performed successfully]

PROACTIVE COMMAND: SEND DATA 11.1.1

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 02 .. CC (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 11.1.1

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 11.1.2

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: CD CE CF .. FF 00 01 .. 99(205 Bytes of data

TERMINAL RESPONSE: SEND DATA 11.1.2

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 11.1.3

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 9A 9B .. FF 00 01 .. 66 (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 11.1.3

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 11.1.4

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 67 68 .. FF 00 01 .. 33 (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 11.1.4

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: 204 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 11.1.5

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 34 35 .. FF (204 Bytes of data)

TERMINAL RESPONSE: SEND DATA 11.1.5

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

11.3.4.2 Test Sequence No 2: (SEND DATA - Default APN Always–ON - Only Single APN supported - with different APN - BUFFER FULLY USED)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.2.1	SEE OPEN CHANNEL SEQ 11.2.1

Step	Direction	Sequence	Expected Result
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.2.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.2.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.1	Send 1024 Bytes of data by packets of 205 Bytes
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.2	[200 Bytes]
15	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.2	[Command performed successfully]
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.3	[200 Bytes]
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.3	[Command performed successfully]
20	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.4	
21	ME → UICC	FETCH	

Step	Direction	Sequence	Expected Result
22	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.4	[200 Bytes]
23	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.4	[Command performed successfully]
24	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.5	
25	ME → UICC	FETCH	
26	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.5	[200 Bytes]
27	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	
28	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.5	[Command performed successfully]

11.3.4.3 Test Sequence No 3: (SEND DATA - Default APN Always-ON - APN empty - BUFFER FULLY USED)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.3.1	See OPEN CHANNEL SEQ 11.3.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.3.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.3.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	

Step	Direction	Sequence	Expected Result
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.1	Send 1024 Bytes of data by packets of 205 Bytes
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.2	[205 Bytes]
15	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.2	[Command performed successfully]
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.3	[205 Bytes]
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.3	[Command performed successfully]
20	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.4	
21	ME → UICC	FETCH	
22	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.4	[205 Bytes]
23	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.4	[Command performed successfully]
24	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.5	
25	ME → UICC	FETCH	
26	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.5	[204 Bytes]
27	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	

Step	Direction	Sequence	Expected Result
28	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.5	[Command performed successfully]

11.3.4.4 Test Sequence No 4: (SEND DATA - Default APN Always-ON - APN empty - BUFFER FULLY USED - Default Bearer Type used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	ME is connected to the USS and the first PDN to the APN for “Always on connection” (web.network.com) has been already established.	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 11.4.1	See OPEN CHANNEL SEQ 11.4.1
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 11.4.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	The terminal shall not send a PDP context activation request	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 11.4.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.1	Send 1024 Bytes of data by packets of 205 Bytes
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.2	[205 Bytes]
15	ME →	TERMINAL RESPONSE: SEND	[Command performed successfully]

Step	Direction	Sequence	Expected Result
	UICC	DATA (store mode) 11.1.2	
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.3	[205 Bytes]
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.3	[Command performed successfully]
20	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.4	
21	ME → UICC	FETCH	
22	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 11.1.4	[205 Bytes]
23	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 11.1.4	[Command performed successfully]
24	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 11.1.5	
25	ME → UICC	FETCH	
26	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 11.1.5	[204 Bytes]
27	ME → USS	Transfer 1024 Bytes of data to the USS through channel 1	
28	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 11.1.5	[Command performed successfully]

12 Remote Management of NFC Services

12.1 General overview

This chapter addresses the remote management of NFC services. The objective is to ensure that the device allows remote application management according to GSMA requirements.

The test cases are grouped in a sub section testing the basic remote management functions of the device and a sub section covering use cases with approach to handle end-2-end functionalities.

The list of conformance requirements tested within this section is listed in the table in section 12.2.

12.2 Conformance requirements

TS26_NFC_REQ_078	The mobile device SHALL support BIP in UICC client mode for UDP.
TS26_NFC_REQ_079	The mobile device SHALL support BIP in UICC client mode for TCP.
TS26_NFC_REQ_080	The mobile device SHALL support two concurrent channels, BIP in UICC client mode.
TS26_NFC_REQ_081	The mobile device SHALL support SMS push (per ETSI TS 102.226 and 3GPP TS 31.116) to establish an open BIP channel as per ETSI TS 102.223 Open Channel Command
TS26_NFC_REQ_088	The device SHALL support the letter class “e” with the following commands and events: Proactive command: OPEN CHANNEL ((UICC in client mode and with the support of UDP/TCP bearer)) Proactive command: CLOSE CHANNEL Proactive command: RECEIVE DATA Proactive command: SEND DATA Proactive command: G ET CHANNEL STATUS Event download: Data available Event download: Channel status
TS26_NFC_REQ_120	The device SHALL support the BIP session regardless of incoming or outgoing calls, incoming or outgoing MMS, SMS. Note: This is not applicable if the device is on a 2G network.

12.3 Basic Remote Management

12.3.1 General overview

This section addresses the testing of the Bearer Independent Protocol (BIP) used in remote management of NFC services.

The list of conformance requirements tested within this section is listed in the table in section 12.3.2.

12.3.2 Conformance requirements

TS26_NFC_REQ_078	The mobile device SHALL support BIP in UICC client mode for UDP.
TS26_NFC_REQ_079	The mobile device SHALL support BIP in UICC client mode for TCP.
TS26_NFC_REQ_080	The mobile device SHALL support two concurrent channels, BIP in UICC client mode.
TS26_NFC_REQ_081	The mobile device SHALL support SMS push (per ETSI TS 102.226) to establish an open BIP channel as per ETSI TS 102.223 Open Channel Command
TS26_NFC_REQ_088	The device SHALL support the letter class “e” with the following commands and events: Proactive command: OPEN CHANNEL ((UICC in client mode and with the support of UDP/TCP bearer)) Proactive command: CLOSE CHANNEL Proactive command: RECEIVE DATA Proactive command: SEND DATA Proactive command: G ET CHANNEL STATUS Event download: Data available Event download: Channel status

12.3.3 Test Cases

12.3.3.1 Remote management in BIP

Test Purpose

To ensure the DUT allows remote management over the Bearer Independent Protocol

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_079
- TS26_NFC_REQ_080
- TS26_NFC_REQ_088

Related Specs/Docs: ETSI TS 102 223 [22]

Test Procedure

The DUT shall pass all test cases referenced in Annex B.6 and in Table 19 and Table 20.

12.3.3.2 OPEN CHANNEL

Test Purpose

To verify OPEN CHANNEL related to Default (network) Bearer, for UICC in client mode for UDP.

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

- All TCs are defined by making use of Bearer Type '03'= default bearer for requested transport layer.
- The DUT is registered in idle mode and is configured to not establish a PDN connection triggered by the OS itself

12.3.3.2.1 Test Sequence No 1: (OPEN CHANNEL, No APN, immediate link establishment, Default Bearer for requested transport layer, No local address, no alpha identifier)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → ME	Set and activate APN "TestGp.rs" in the terminal configuration if required	[see initial conditions]
2	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND : OPEN CHANNEL 1.1	
5	ME → User	The ME may display channel opening information	
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE : OPEN CHANNEL 1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

12.3.3.2.2 Test Sequence No 2: (OPEN CHANNEL, with APN, immediate link establishment, Default Bearer for requested transport layer, no alpha identifier)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 2.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 2.1	

Step	Direction	Sequence	Expected Result
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 2.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 2.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Network access name (APN): TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 2.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status: Channel identifier 1 and link established or PDP context activated

Bearer Description:

Bearer Type: Default Bearer for requested transport layer

Buffer

Buffer size 1400

12.3.3.2.3 Test Sequence No 3: (OPEN CHANNEL, with alpha identifier, immediate link establishment, Default Bearer for requested transport layer)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 3.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 3.1	
4	ME → User	Confirmation phase with alpha ID	“Open ID”
5	User → ME	Confirm	
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 3.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Alpha Identifier Open ID

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

12.3.3.2.4 Test Sequence No 4: (OPEN CHANNEL, with null alpha identifier, immediate link establishment, Default Bearer for requested transport layer)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 4.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 4.1	
4	ME → User	Confirmation phase	[The ME should not give any information]
5	User → ME	Confirm	[Only if the ME asks for user confirmation]
6	ME → USS	PDP context activation request	
7	USS → ME	PDP context activation accept	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 4.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source de vice: UICC

Destination device: ME

Alpha Identifier Null

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

12.3.3.2.5 Test Sequence No 5: (OPEN CHANNEL, command performed with modifications (buffer size), immediate link establishment, Default Bearer for requested transport layer)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 5.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 5.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 5.1	[Command performed with modification]

PROACTIVE COMMAND: OPEN CHANNEL 5.1

Command details

Command number:1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 65535

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 5.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed with modifications (07)

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: The buffer size TLV shall be attached and contain the value stated in Table 6a/1 "Preferred buffer size supported by the terminal for Open Channel command".

12.3.3.2.6 Test Sequence No 6A: (OPEN CHANNEL, user rejection, immediate link establishment, Default Bearer for requested transport layer, open command with alpha identifier,)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 6.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 6.1	
4	ME → User	Confirmation phase with alpha ID	[The ME shall display “Open ID”]
5	User → ME	Reject	
6	ME → USS	No PDP context activation request is sent to the USS	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 6.1	[User did not accept the proactive command]

PROACTIVE COMMAND: OPEN CHANNEL 6.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Alpha Identifier "Open ID"

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 6.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: User did not accept the proactive command

Channel status The presence and content of this TLV shall not be verified

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: Because the value depends in this case on the terminal's implementation, it shall be ignored.

12.3.3.2.7 Test Sequence No 6B: (OPEN CHANNEL, User rejection, immediate link establishment, Default Bearer for requested transport layer, open command with alpha identifier)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 6.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 6.1	
4	ME → USS	PDP context activation request	
5	USS → ME	PDP context activation accept	
6	ME → User	Confirmation phase with alpha ID	[The ME shall display "Open ID"]
7	User → ME	Reject	
8	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 6.1	[User did not accept the proactive command]

PROACTIVE COMMAND: OPEN CHANNEL 6.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: UICC
Destination device: ME
Alpha Identifier "Open ID"
Bearer description
Bearer type: Default Bearer for requested transport layer
Buffer
Buffer size: 1400
Network access name: TestGp.rs
Text String: UserLog (User login)
Text String: UserPwd (User password)
UICC/ME interface transport level
Transport format: UDP
Port number: 44444
Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 6.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: ME
Destination device: UICC
Result
General Result: User did not accept the proactive command
Channel status The presence and content of this TLV shall not be verified
Bearer description
Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: Because the value depends in this case on the terminal's implementation, it shall be ignored.

12.3.3.3 CLOSE CHANNEL

Test Purpose

To verify CLOSE CHANNEL related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

- All TCs are defined by making use of Bearer Type '03'= default bearer for requested transport layer.
- The DUT is registered in idle mode and is configured to not establish a PDN connection triggered by the OS itself

12.3.3.3.1 Test Sequence No 1: (CLOSE CHANNEL, successful)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 1.1	

Step	Direction	Sequence	Expected Result
11	ME → USS	PDP context deactivation request	
12	USS → ME	PDP context deactivation accept	
13	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

PROACTIVE COMMAND: CLOSE CHANNEL 1.1

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

TERMINAL RESPONSE: CLOSE CHANNEL 1.1

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

12.3.3.3.2 Test Sequence No 2: (CLOSE CHANNEL, with an invalid channel identifier)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	

Step	Direction	Sequence	Expected Result
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 2.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 2.1	
11	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 2.1	[Invalid channel number]

PROACTIVE COMMAND: CLOSE CHANNEL 2.1

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 2

TERMINAL RESPONSE: CLOSE CHANNEL 2.1

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Bearer Independent Protocol error

Additional Result: Channel identifier not valid

12.3.3.3.3 Test Sequence No 3: (CLOSE CHANNEL, on an already closed channel)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 1.1	
11	ME → USS	PDP context deactivation request	
12	USS → ME	PDP context deactivation accept	
13	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 1.1	[Command performed successfully]
14	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 1.1	
15	ME → UICC	FETCH	
16	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 1.1	
17	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 3.1A or TERMINAL RESPONSE CLOSE CHANNEL 3.1B	[Channel closed] [Channel identifier invalid]

TERMINAL RESPONSE: CLOSE CHANNEL 3.1A

Command details

Command number:1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Bearer Independent Protocol error

Additional Result: Channel closed

TERMINAL RESPONSE: CLOSE CHANNEL 3.1B

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Bearer Independent Protocol error

Additional Result: Channel identifier invalid

12.3.3.4 RECEIVE DATA

Test Purpose

To verify RECEIVE DATA related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

- All TCs are defined by making use of Bearer Type ‘03’= default bearer for requested transport layer.
- The DUT is registered in idle mode and is configured to not establish a PDN connection triggered by the OS itself

12.3.3.4.1 Test Sequence No 1: (RECEIVE DATA)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 1.1 PENDING	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 1.1	
4	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 1.1	
5	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
6	ME → UICC	FETCH	
7	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
8	ME → User	The ME may display channel opening information	
9	ME → USS	PDP context activation request	
10	USS → ME	PDP context activation accept	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 1.1	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 1.1	
15	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 1.1	[Command performed successfully]
17	USS → ME	Transfer 1000 Bytes of data to the ME through channel 1 using the ME's port number, which was retrieved in step 15	
18	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 1.1	(1000 Bytes of data in the ME buffer)
19	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1.1	

Step	Direction	Sequence	Expected Result
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1.1	200 Bytes
22	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1.1	
23	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1.2	
24	ME → UICC	FETCH	
25	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1.2	200 Bytes
26	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1.2	
27	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1.3	
28	ME → UICC	FETCH	
29	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1.3	200 Bytes
30	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1.3	
31	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1.4	
32	ME → UICC	FETCH	
33	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1.4	200 Bytes
34	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1.4	
35	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1.5	
36	ME → UICC	FETCH	
37	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1.5	200 Bytes
38	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1.5	

PROACTIVE COMMAND: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP EVENT LIST

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: ME

Event list Data available

TERMINAL RESPONSE: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP EVENT LIST

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

PROACTIVE COMMAND: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

ENVELOPE: EVENT DOWNLOAD - Data available 1.1

Event list

Event: Data available

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: FF (more than 255 bytes are available)

PROACTIVE COMMAND: RECEIVE DATA 1.1

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 200

PROACTIVE COMMAND: RECEIVE DATA 1.2

Command details

Command number: 2

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 200

PROACTIVE COMMAND: RECEIVE DATA 1.3

Command details

Command number: 3

Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 200

PROACTIVE COMMAND: RECEIVE DATA 1.4
Command details
Command number: 4
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 200

PROACTIVE COMMAND: RECEIVE DATA 1.5
Command details
Command number: 5
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 200

TERMINAL RESPONSE: RECEIVE DATA 1.1
Command details
Command number: 1
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result

General Result: Command performed successfully

Channel Data : 00 01 02 .. C7 (200 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 1.2

Command details

Command number: 2

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : C8 C9 CA .. FF 00 01 .. 8F (200 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 1.3

Command details

Command number: 3

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : 90 91 .. FF 00 01 – 57 (200 Bytes of data)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 1.4

Command details

Command number: 4

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : 58 59 .. FF 00 01 .. 1F (200 Bytes of data)

Channel data length: C8

TERMINAL RESPONSE: RECEIVE DATA 1.5

Command details

Command number: 5

Command type: RECEIVE DATA

Command qualifier: RFU Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: 20 21 .. E7 (200 Bytes of data)

Channel data length: 00

12.3.3.5 SEND DATA

Test Purpose

To verify SEND DATA related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

- All TCs are defined by making use of Bearer Type '03' = default bearer for requested transport layer.
- The DUT is registered in idle mode and is configured to not establish a PDN connection triggered by the OS itself

12.3.3.5.1 Test Sequence No 1: (SEND DATA, immediate mode)

Initial Conditions

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	

Step	Direction	Sequence	Expected Result
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 1.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 1.1	
11	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	
12	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 1.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

PROACTIVE COMMAND: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

12.3.3.5.2 Test Sequence No 2: (SEND DATA, Store mode)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 2.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 2.1	Send 500 Bytes of data (200 + 200 + 100)
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 2.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 2.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 2.2	[200 Bytes]
15	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 2.2	[Command performed successfully]
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 2.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (Immediate mode) 2.3	[100 Bytes]

Step	Direction	Sequence	Expected Result
19	ME → USS	Transfer 500 Bytes of data to the USS through channel 1	
20	ME → UICC	TERMINAL RESPONSE: SEND DATA (Immediate mode) 2.3	[Command performed successfully]

PROACTIVE COMMAND: SEND DATA 2.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 00 01 .. C7 (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 2.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 2.2

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : C8 C9 .. FF 00 01 .. 8F (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 2.2

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 2.3

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Immediate mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 90 91 .. F3 (100 Bytes of data)

TERMINAL RESPONSE: SEND DATA 2.3

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Immediate mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

12.3.3.5.3 Test Sequence No 3: (SEND DATA, Tx buffer fully used, Store mode)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.1	Send 1000 Bytes of data by packets of 200 Bytes
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.2	[200 Bytes]
15	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.2	[Command performed successfully]
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.3	[200 Bytes]

Step	Direction	Sequence	Expected Result
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.3	[Command performed successfully]
20	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.4	
21	ME → UICC	FETCH	
22	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.4	[200 Bytes]
23	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.4	[Command performed successfully]
24	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.5	
25	ME → UICC	FETCH	
26	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 3.5	[200 Bytes]
27	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	
28	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 3.5	[Command performed successfully]

PROACTIVE COMMAND: SEND DATA 3.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 00 01 02 .. C7 (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 3.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 3.2

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : C8 C9 CA .. FF 00 01 .. 8F (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 3.2

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 3.3

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 90 91 .. FF 00 01 .. 57 (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 3.3

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 3.4

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data : 58 59 .. FF 00 01 .. 1F (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 3.4

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Store mode

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: 200 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 3.5

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 20 21 .. E7 (200 Bytes of data)

TERMINAL RESPONSE: SEND DATA 3.5

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

12.3.3.5.4 Test Sequence No 4: (SEND DATA, 2 consecutive SEND DATA Store mode)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	

Step	Direction	Sequence	Expected Result
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1..1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.1	Send 1000 Bytes of data by packets of 200 Bytes
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.1	[Command performed successfully]
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.2	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.2	[200 Bytes]
15	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.2	[Command performed successfully]
16	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.3	
17	ME → UICC	FETCH	
18	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.3	[200 Bytes]
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.3	[Command performed successfully]
20	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.4	
21	ME → UICC	FETCH	
22	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.4	[200 Bytes]
23	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.4	[Command performed successfully]
24	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.5	
25	ME → UICC	FETCH	

Step	Direction	Sequence	Expected Result
26	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 3.5	[200 Bytes]
27	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	
28	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 3.5	[Command performed successfully]
29	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.1	
30	ME → UICC	FETCH	
31	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.1	Send 1000 Bytes of data by packets of 200 Bytes
32	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.1	[Command performed successfully]
33	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.2	
34	ME → UICC	FETCH	
35	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.2	[200 Bytes]
36	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.2	[Command performed successfully]
37	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.3	
38	ME → UICC	FETCH	
39	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.3	[200 Bytes]
40	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.3	[Command performed successfully]
41	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.4	
42	ME → UICC	FETCH	
43	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 3.4	[200 Bytes]
44	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 3.4	[Command performed successfully]

Step	Direction	Sequence	Expected Result
45	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 3.5	
46	ME → UICC	FETCH	
47	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 3.5	[200 Bytes]
48	ME → USS	Transfer 1000 Bytes of data to the USS through channel 1	
49	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 3.5	[Command performed successfully]

12.3.3.5.5 Test Sequence No 5: (SEND DATA, immediate mode with a bad channel identifier)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → User	The ME may display channel opening information	
5	ME → USS	PDP context activation request	
6	USS → ME	PDP context activation accept	
7	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
8	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 5.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 5.1	
11	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 5.1	[Invalid channel number]

PROACTIVE COMMAND: SEND DATA 5.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 2

Channel Data

Channel Data : 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 5.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Bearer Independent Protocol error (3A)

Additional Result: Channel identifier not valid (03)

12.3.3.6 GET CHANNEL STATUS

Test Purpose

To verify GET CHANNEL STATUS related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

All TCs are defined by making use of Bearer Type '03'= default bearer for requested transport layer.

12.3.3.6.1 Test Sequence No 1: (GET STATUS, without any BIP channel opened)

Initial Conditions

No channel has been opened.

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: GET CHANNEL STATUS 1.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: GET STATUS 1.1	
4	ME → UICC	TERMINAL RESPONSE GET STATUS 1.1A Or TERMINAL RESPONSE: GET STATUS 1.1B Or TERMINAL RESPONSE: GET STATUS 1.1C	[Command performed successfully]

PROACTIVE COMMAND: GET STATUS 1.1

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: ME

TERMINAL RESPONSE: GET STATUS 1.1A

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

TERMINAL RESPONSE: GET STATUS 1.1B

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel status: No Channel available, link not established or PDP context not activated

TERMINAL RESPONSE: GET STATUS 1.1C

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel 1 status: Channel identifier 1, Link not established or PDP context not activated

Channel 2 status: Channel identifier 2, Link not established or PDP context not activated

.

Channel n status: Channel identifier n, Link not established or PDP context not activated

The number of channel status data objects shall be same as the number of channels(n) supported by the ME

12.3.3.6.2 Test Sequence No 2: (GET STATUS, with a BIP channel currently opened)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions

Step	Direction	Sequence	Expected Result
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
4	ME → USS	PDP context activation request	
5	USS → ME	PDP context activation accept	
6	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
7	UICC → ME	PROACTIVE COMMAND PENDING: GET CHANNEL STATUS 2.1	
8	ME → UICC	FETCH	
9	UICC → ME	PROACTIVE COMMAND: GET STATUS 2.1	
10	ME → UICC	TERMINAL RESPONSE GET STATUS 2.1A Or TERMINAL RESPONSE: GET STATUS 2.1B	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

PROACTIVE COMMAND: GET STATUS 2.1

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: ME

TERMINAL RESPONSE: GET STATUS 2.1A

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel status: Channel 1 open, link established or PDP context activated

TERMINAL RESPONSE: GET STATUS 2.1B

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel 1 status: Channel identifier 1 open, Link established or PDP context activated

Channel 2 status: Channel identifier 2, Link not established or PDP context not activated

Channel n status: Channel identifier n, Link not established or PDP context not activated

The number of channel status data objects shall be same as the number of channels(n) supported by the ME

12.3.3.6.3 Test Sequence No 3: (GET STATUS, after a link dropped)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: SET UP EVENT LIST 1.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 1.1	
4	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 1.1	[Command performed successfully]
5	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions

Step	Direction	Sequence	Expected Result
6	ME → UICC	FETCH	
7	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
8	ME → USS	PDP context activation request	
9	USS → ME	PDP context activation accept	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
11	USS → ME	DROP LINK	
12	ME → UICC	ENVELOPE EVENT DOWNLOAD: CHANNEL STATUS 1.1	[Link dropped]
13	UICC → ME	PROACTIVE COMMAND PENDING: GET STATUS 1.1	
14	ME → UICC	FETCH	
15	UICC → ME	PROACTIVE COMMAND: GET STATUS 1.1	
16	ME → UICC	TERMINAL RESPONSE: GET STATUS 3.1A Or TERMINAL RESPONSE: GET STATUS 3.1B Or TERMINAL RESPONSE: GET STATUS 3.1C Or TERMINAL RESPONSE: GET STATUS 3.1D Or TERMINAL RESPONSE: GET STATUS 3.1E	[Command performed successfully]

TERMINAL RESPONSE: GET STATUS 3.1A

Same as TERMINAL RESPONSE: GET STATUS 1.1A

TERMINAL RESPONSE: GET STATUS 3.1B

Same as TERMINAL RESPONSE: GET STATUS 1.1B

TERMINAL RESPONSE: GET STATUS 3.1C

Same as TERMINAL RESPONSE: GET STATUS 1.1C

TERMINAL RESPONSE: GET STATUS 3.1D

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel status: Channel 1, link dropped

TERMINAL RESPONSE: GET STATUS 3.1E

Command details

Command number: 1

Command type: GET STATUS

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status

Channel 1 status: Channel identifier 1, link dropped

Channel 2 status: Channel identifier 2, Link not established or PDP context not activated

.

Channel n status: Channel identifier n, Link not established or PDP context not activated

The number of channel status data objects shall be same as the number of channels(n) supported by the ME

PROACTIVE COMMAND: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP‘EV’NT LIST

Command qualifier: ’00’

Device identities

Source device: UICC

Destination device: ME

Event list

Event 1: Channel Status

TERMINAL RESPONSE: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP‘EV’NT LIST

Command qualifier: ’00’

Device identities

Source device: ME

Destination device: UICC

Result General Result: Command performed successfully

ENVELOPE EVENT DOWNLOAD: CHANNEL STATUS 1.1

Event list

Event list: Channel Status

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1, link dropped

12.3.3.7 Data available event

Test Purpose

To verify Data available event related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

All TCs are defined by making use of Bearer Type ‘03’ = default bearer for requested transport layer.

12.3.3.7.1 Test Sequence No 1: (EVENT DOWNLOAD - Data available)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC ⎸ ME	PROACTIVE COMMAND PENDING: SET UP EVENT LIST 1.1	
2	ME⎸ UICC	FETCH	
3	UICC⎸ ME	PROACTIVE COMMAND: SET UP EVENT LIST 1.1	
4	ME⎸ UICC	TERMINAL RESPONSE: SET UP EVENT LIST 1.1	
5	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
6	ME → UICC	FETCH	
7	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	[Command performed successfully]
8	ME → User	The ME may display channel opening information	
9	ME → USS	PDP context activation request	
10	USS → ME	PDP context activation accept	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	
12	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 1.1	
13	ME → UICC	FETCH	
14	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 1.1	
15	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
16	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 1.1	[Command performed successfully]
17	USS → ME	Send data through the BIP channel using the ME's port number, which was retrieved in step 11	
18	ME → UICC	ENVELOPE 1.1 (Event-Data Available)	

PROACTIVE COMMAND: SET UP EVENT LIST 1.1

Logically:

Command details
Command number: 1
Command type: SET UP EVENT LIST
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: ME
Event list Data available

TERMINAL RESPONSE: SET UP EVENT LIST 1.1

Logically:

Command details
Command number: 1
Command type: SET UP EVENT LIST
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: UICC
Destination device: ME
Bearer
Bearer type: Default Bearer for requested transport layer
Buffer
Buffer size: 1000
Network access name: TestGp.rs
Text String: UserLog (User login)
Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

PROACTIVE COMMAND: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 1.1

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

ENVELOPE: EVENT DOWNLOAD - Data available 1.1

Event list

Event: Data available

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: 8 Bytes available in Rx buffer

12.3.3.8 Channel Status event

Test Purpose

To verify Channel Status event related to Default (network) Bearer, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

All TCs are defined by making use of Bearer Type '03'= default bearer for requested transport layer.

12.3.3.8.1 Test Sequence No 1: (EVENT DOWNLOAD - Channel Status on a link dropped)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: SET UP EVENT LIST 1.1	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMA ND: SET UP EVENT LIST 1.1	[EVENT: channel status]

Step	Direction	Sequence	Expected Result
4	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 1.1	[command performed successfully]
5	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 1.1	See initial conditions
6	ME → UICC	FETCH	
7	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 1.1	
8	ME → User	The ME may display channel opening information	
9	ME → USS	PDP context activation request	
10	USS → ME	PDP context activation accept	
11	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 1.1	[Command performed successfully]
12	USS → ME	Drop Link	
13	ME → UICC	ENVELOPE 1.1 (Event-Channel Status)	

PROACTIVE COMMAND: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP‘EV’NT LIST

Command qualifier: ’00’

Device identities

Source device: UICC

Destination device: ME

Event list

Event 1: Channel Status

TERMINAL RESPONSE: SET UP EVENT LIST 1.1

Command details

Command number: 1

Command type: SET UP‘EV’NT LIST

Command qualifier: ’00’

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

Network access name: TestGp.rs

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: Default Bearer for requested transport layer

Buffer

Buffer size: 1000

ENVELOPE: EVENT DOWNLOAD - Channel Status 1.1

Event list

Event: Channel Status

Device identities

Soure device: ME

Destination device: UICC

Channel status

Channel status: Channel 1, link dropped

12.3.3.9 SMS-PP Data Download

Test Purpose

To verify SMS-PP Data Download related to GPRS, for UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_081

Initial Conditions

All TCs are defined by making use of Bearer Type '02'= GPRS bearer for requested transport layer.

12.3.3.9.1 Test Sequence No 1: (SMS-PP - followed by Open channel - Send/Receive data)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Test Procedure SMS-PP Data Download	as specified in 12.3.3.9.4.
2		Test Procedure Open Channel	as specified in 12.3.3.9.4.
3		Test Procedure Send Data	as specified in 12.3.3.9.4.
4		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
5		Test Procedure Send Data	as specified in 12.3.3.9.4.
6		Test Procedure Send Data	as specified in 12.3.3.9.4.
7		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
8		Test Procedure Send Data	as specified in 12.3.3.9.4.
9		Test Procedure Send Data	as specified in 12.3.3.9.4.
10		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
11		Test Procedure Send Data	as specified in 12.3.3.9.4.

Step	Direction	Sequence	Expected Result
12		Test Procedure Send Data	as specified in 12.3.3.9.4.
13		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
14		Test Procedure Send Data	as specified in 12.3.3.9.4.
15		Test Procedure Send Data	as specified in 12.3.3.9.4.
16		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
17		Test Procedure Send Data	as specified in 12.3.3.9.4.
18		Test Procedure Send Data	as specified in 12.3.3.9.4.
19		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
20		Test Procedure Send Data	as specified in 12.3.3.9.4.
21		Test Procedure Send Data	as specified in 12.3.3.9.4.
22		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
23		Test Procedure Send Data	as specified in 12.3.3.9.4.
24		Test Procedure Send Data	as specified in 12.3.3.9.4.
25		Test Procedure Receive Data 1	as specified in 12.3.3.9.4
26		Test Procedure Receive Data 1	as specified in 12.3.3.9.4

12.3.3.9.2 Test Sequence No 2: (SMS-PP - Send SM -followed by Open channel - Send/Receive data)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Test Procedure SMS-PP Data Download	as specified in 12.3.3.9.4
2		Test Procedure Send Short Message	as specified in 12.3.3.9.4
3		Test Procedure Open Channel	as specified in 12.3.3.9.4
4		Test Procedure Send Data	as specified in 12.3.3.9.4
5		Test Procedure Receive Data 1	as specified in 12.3.3.9.4
6		Test Procedure Send Data	as specified in 12.3.3.9.4
7		Test Procedure Send Data	as specified in 12.3.3.9.4
8		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
9		Test Procedure Send Data	as specified in 12.3.3.9.4

Step	Direction	Sequence	Expected Result
10		Test Procedure Send Data	as specified in 12.3.3.9.4
11		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
12		Test Procedure Send Data	as specified in 12.3.3.9.4
13		Test Procedure Send Data	as specified in 12.3.3.9.4
14		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
15		Test Procedure Send Data	as specified in 12.3.3.9.4
16		Test Procedure Send Data	as specified in 12.3.3.9.4
17		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
18		Test Procedure Send Data	as specified in 12.3.3.9.4
19		Test Procedure Send Data	as specified in 12.3.3.9.4
20		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
21		Test Procedure Send Data	as specified in 12.3.3.9.4
22		Test Procedure Send Data	as specified in 12.3.3.9.4
23		Test Procedure Receive Data 2	as specified in 12.3.3.9.4
24		Test Procedure Send Data	as specified in 12.3.3.9.4
25		Test Procedure Send Data	as specified in 12.3.3.9.4
26		Test Procedure Receive Data 1	as specified in 12.3.3.9.4
27		Test Procedure Receive Data 1	as specified in 12.3.3.9.4

12.3.3.9.3 Test Sequence No 3: (SMS-PP - Send SM -followed by Open channel - Send/Receive data with timer management)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Test Procedure SMS-PP Data Download	as specified in 12.3.3.9.4.
2		Test Procedure Send Short Message	as specified in 12.3.3.9.4.
3		Test Procedure Open Channel	as specified in 12.3.3.9.4.
4		Test Procedure Send Data	as specified in 12.3.3.9.4.
5		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
6		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.

Step	Direction	Sequence	Expected Result
7		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
8		Test Procedure Send Data	as specified in 12.3.3.9.4.
9		Test Procedure Send Data	as specified in 12.3.3.9.4.
10		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
11		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
12		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
13		Test Procedure Send Data	as specified in 12.3.3.9.4.
14		Test Procedure Send Data	as specified in 12.3.3.9.4.
15		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
16		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
17		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
18		Test Procedure Send Data	as specified in 12.3.3.9.4.
19		Test Procedure Send Data	as specified in 12.3.3.9.4.
20		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
21		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
22		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
23		Test Procedure Send Data	as specified in 12.3.3.9.4.
24		Test Procedure Send Data	as specified in 12.3.3.9.4.
25		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
26		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
27		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
28		Test Procedure Send Data	as specified in 12.3.3.9.4.
29		Test Procedure Send Data	as specified in 12.3.3.9.4.
30		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
31		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.

Step	Direction	Sequence	Expected Result
32		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
33		Test Procedure Send Data	as specified in 12.3.3.9.4.
34		Test Procedure Send Data	as specified in 12.3.3.9.4.
35		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
36		Test Procedure Receive Data 2	as specified in 12.3.3.9.4.
37		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.
38		Test Procedure Send Data	as specified in 12.3.3.9.4.
39		Test Procedure Send Data	as specified in 12.3.3.9.4.
40		Test Procedure Timer Management (Start Timer)	as specified below
41		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
42		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
43		Test Procedure Timer Management (Deactivate Timer)	as specified in 12.3.3.9.4.

12.3.3.9.4 Reference Test Procedures

Test Procedure Open Channel (OPEN CHANNEL, immediate link establishment, GPRS, no local address)

Step	Direction	Sequence	Expected Result
1	UICC ⎪ ME	PROACTIVE COMMAND PENDING : SET UP EVENT LIST	
2	ME⎪ UICC	FETCH	
3	UICC⎪ ME	PROACTIVE COMMAND: SET UP EVENT LIST	
4	ME⎪ UICC	TERMINAL RESPONSE: SET UP EVENT LIST	
5	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL	
6	ME → UICC	FETCH	
7	UICC → ME	PROACTIVE COMMAND : OPEN CHANNEL	
8	ME → User	The ME may display channel opening information	

Step	Direction	Sequence	Expected Result
9	ME → USS	PDP context activation request	
10	USS → ME	PDP context activation accept	
11	ME → UICC	TERMINAL RESPONSE : OPEN CHANNEL	[Command performed successfully]

PROACTIVE COMMAND: SET UP EVENT LIST

Logically:

Command details

Command number: 1

Command type: SET UP EVENT LIST

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: ME

Event list Data available

TERMINAL RESPONSE: SET UP EVENT LIST

Logically:

Command details

Command number: 1

Command type: SET UP EVENT LIST

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

PROACTIVE COMMAND: OPEN CHANNEL

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: GPRS

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

Network Access Name: web99.test-nfc1.com

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status: Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: GPRS

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

Test Procedure Send Data (SEND DATA, immediate mode)

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate)	
4	ME → USS	Transfer 40 Bytes of data to the USS through channel 1	
5	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate)	[Command performed successfully]

PROACTIVE COMMAND: SEND DATA

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22 23 24 25 26 27 (40 Bytes of data)

TERMINAL RESPONSE: SEND DATA

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

Test Procedure Receive Data 1 (RECEIVE DATA)

Step	Direction	Sequence	Expected Result
1	USS → ME	Transfer 20 Bytes of data to the ME through channel 1	
2	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 1	(20 Bytes of data in the ME buffer)1
3	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 1	
4	ME → UICC	FETCH	
5	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 1	20 Bytes
6	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 1	

ENVELOPE: EVENT DOWNLOAD - Data available 1

Event list

Event: Data available

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: 20

PROACTIVE COMMAND: RECEIVE DATA 1

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 20

TERMINAL RESPONSE: RECEIVE DATA 1

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13(20 Bytes of data)

Channel data length: 00

Test Procedure Receive Data 2 (RECEIVE DATA)

Step	Direction	MESSAGE / Action	Comments
1	USS → ME	Transfer 1022 Bytes of data to the ME through channel 1	
2	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 2	(FF Bytes of data in the ME buffer) 2
3	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 2.1	
4	ME → UICC	FETCH	
5	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 2.1	FF Bytes
6	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 2.1	
7	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 2.2	
8	ME → UICC	FETCH	
9	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 2.2	FF Bytes
10	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 2.2	
11	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 2.3	
12	ME → UICC	FETCH	
13	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 2.3	FF Bytes
14	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 2.3	

Step	Direction	MESSAGE / Action	Comments
15	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 2.4	
16	ME → UICC	FETCH	
17	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 2.4	FF Bytes
18	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 2.4	
19	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 2.5	
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 2.5	74 Bytes
22	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 2.5	

ENVELOPE: EVENT DOWNLOAD - Data available 2

Event list

Event: Data available

Device identities

Source device: ME

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: FF (more than 255 bytes are available)

PROACTIVE COMMAND: RECEIVE DATA 2.1

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: FF

PROACTIVE COMMAND: RECEIVE DATA 2.2

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: FF

PROACTIVE COMMAND: RECEIVE DATA 2.3

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: FF

PROACTIVE COMMAND: RECEIVE DATA 2.4

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: FF

PROACTIVE COMMAND: RECEIVE DATA 2.5

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 74

TERMINAL RESPONSE: RECEIVE DATA 2.1

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: 00 01 02……EC (237 Bytes)

Channel data length: FF Bytes

TERMINAL RESPONSE: RECEIVE DATA 2.2

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: ED EE EF……D9 (237 Bytes)

Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 2.3

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: DA DB…..C6(237 Bytes)

Channel data Length: FF

TERMINAL RESPONSE: RECEIVE DATA 2.4

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: C7 C9…..B3(237 Bytes)

Channel data Length: 74

TERMINAL RESPONSE: RECEIVE DATA 2.5

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : B4…..FD (74 Bytes)

Channel data length: 00

Test Procedure Timer Management (Start Timer)

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: TIMER MANAGEMENT	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: TIMER MANAGEMENT	Start timer 1

Step	Direction	Sequence	Expected Result
4	ME → UICC	TERMINAL RESPONSE: TIMER MANAGEMENT	Command performed successfully.

PROACTIVE COMMAND: TIMER MANAGEMENT (Start timer)

Command details
Command number: 1
Command type: TIMER MANAGEMENT
Command qualifier: start the Timer
Device identities
Source device: UICC
Destination device: ME
Timer identifier
Identifier of timer: 1
Timer value
Value of timer: 00:02:00

TERMINAL RESPONSE: TIMER MANAGEMENT

Command details
Command number: 1
Command type: TIMER MANAGEMENT
Command qualifier: start the Timer
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Timer identifier
Identifier of timer: 1

Test Procedure Timer Management (Deactivate Timer)

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: TIMER MANAGEMENT	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: TIMER MANAGEMENT	Deactivate timer 1

Step	Direction	Sequence	Expected Result
4	ME → UICC	TERMINAL RESPONSE: TIMER MANAGEMENT	Command performed successfully.

PROACTIVE COMMAND: TIMER MANAGEMENT (Deactivate Timer)

Command details
Command number: 1
Command type: TIMER MANAGEMENT
Command qualifier: deactivate the Timer
Device identities
Source device: UICC
Destination device: ME
Timer identifier
Identifier of timer: 1

TERMINAL RESPONSE: TIMER MANAGEMENT

Command details
Command number: 1
Command type: TIMER MANAGEMENT
Command qualifier: deactivate the Timer
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Timer identifier
Identifier of timer: 1
Timer value
Value of timer: not checked

Test Procedure Send Short Message

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: SEND SHORT MESSAGE	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: SEND SHORT MESSAGE	[packing not required,8 bit data]
4	ME → USS	Send RP-DATA containing SMS-PP (SEND SHORT MESSAGE) Message	CS or PS domain is used to send and receive short messages

Step	Direction	Sequence	Expected Result
5	USS → ME	RP-ACK	
6	ME → UICC	TERMINAL RESPONSE: SEND SHORT MESSAGE	[Command performed successfully]

PROACTIVE COMMAND: SEND SHORT MESSAGE

Command details

Command number: 1

Command type: SEND SHORT MESSAGE

Command qualifier: packing not required

Device identities

Source device: UICC

Destination device: Network

Address

TON: International number

NPI: "ISDN / telephone numbering plan"

Dialling number string "491720354333"

SMS TPDU

TP-MTI: SMS-SUBMIT (in the direction MS to SC)

TP-RD: Instruct the SC to accept an SMS-SUBMIT for a SM

TP-VPF: TP-VP field not present

TP-RP: TP-Reply-Path is not set in this SMS-SUBMIT

TP-UDHI: The beginning of the TP-UD field contains a header in addition to the short message

TP-SRR: A status report is not requested

TP-MR: "00"

TP-DA

TON: Unknown

NPI: "ISDN / telephone numbering plan"

Address value: "10001"

TP-PID: no interworking, but SME to SME protocol

TP-DCS: 8-bit data, Class 2 SIM-specific Message

TP-UDL: 19

Information-Element-Ident: RFU

Data: "A@@...."

TP-UD: 02 71 00 00 0E 0A C0 00 00 00 00 00 04 31 00 00 01 6A 88

SMS-PP (SEND SHORT MESSAGE) Message

TP-MTI: SMS-SUBMIT(in the direction MS to SC)

TP-RD: Instruct the SC to accept an SMS-SUBMIT for a SM

TP-VPF: TP-VP field not present

TP-RP: TP-Reply-Path is not set in this SMS-SUBMIT

TP-UDHI: The beginning of the TP-UD field contains a header in addition to the short message

TP-SRR: A status report is not requested

TP-MR: "01"

TP-DA

TON: Unknown

NPI: "ISDN / telephone numbering plan"

Address value: "10001"

TP-PID: no interworking, but SME to SME protocol

TP-DCS: 8-bit data, Class 2 SIM-specific Message

TP-UDL: 19

Information-Element-Ident: RFU

Data: "A@@...."

TP-UD: 02 71 00 00 0E 0A C0 00 00 00 00 00 04 31 00 00 01 6A 88

TERMINAL RESPONSE: SEND SHORT MESSAGE

Command details

Command number: 1

Command type: SEND SHORT MESSAGE

Command qualifier: packing not required

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Test Procedure SMS-PP Data Download

Step	Direction	Sequence	Expected Result
1	User → ME	Switch the ME on	ME will perform Profile Download and USIM initialisation
2	ME → USS	ME performs CS/PS or CS or PS registration.	
3	USS → ME	SMS-PP Data Download Message	See Note 1.

4	ME → User	The ME shall not display the message or alert the user of a short message waiting.	
5	ME → UICC	ENVELOPE: SMS-PP DOWNLOAD	
6	UICC → ME	SMS-PP Data Download UICC Acknowledgement	[SW1 / SW2 of '90 00']
7	ME → USS	SMS-PP Data Download UICC Acknowledgement in the TP-User-Data element of the RP-ACK message. The values of protocol identifier and data coding scheme in RP-ACK shall be as in the original message.	
Note 1: CS or PS domain is used to send and receive short messages			

SMS-PP (Data Download) Message

SMS TPDU

TP-MTI: SMS-DELIVER

TP-MMS: No more messages waiting for the MS in this SC

TP-RP: TP-Reply-Path is not set in this SMS-DELIVER

TP-UDHI: The beginning of the TP-UD field contains a header in addition to the short message

TP-SRI: A status report will be returned to the SME

TP-OA

TON Unknown

NPI "ISDN / telephone numbering plan"

Address value "10001"

TP-PID (U): U SIM Data download

TP-DCS

Coding Group General Data Coding

Compression Text is uncompressed

Message Class: Class 2 USIM Specific Message

Alphabet 8 bit data

TP-SCTS: 01/01/98 00:00:00 +0

TP-UDL : 109

TP-UD 02 70 00 00 68 15 16 21 19 19 C0 00 00 4F F5 A4 61 BE 1E E9 C0 6A 62 44 15 23 47 DA 22 24 B8 87 27 CC F7 0B 32 38 B2 6D D2 E0 7F 18 33 5A 06 4E 5F C5 C1 44 F7 0E 17 68 51 41 09 D9 28 43 79 B3 65 16 F4 E0 6F E3 10 0A 04 C2 18 0B 64 D7 F8 7C 88 6D BB F1 D9 EC 39 0C 02 67 24 BB DC 7B 50 06 9A 22 15 6F FC 3F 04 1B EE E1 C7 04 33

ENVELOPE: SMS-PP DOWNLOAD

SMS-PP Download

Device identities

Source device: Network

Destination device: UICC

Address

TON: International number

NPI: "ISDN / telephone numbering plan"

Dialling number string: "491720354333"

SMS TPDU

TP-MTI: SMS-DELIVER

TP-MMS: No more messages waiting for the MS in this SC

TP-RP: TP-Reply-Path is not set in this SMS-DELIVER

TP-UDHI: The beginning of the TP-UD field contains a header in addition to the short message

TP-SRI: A status report will be returned to the SME

TP-OA

TON: Unknown

NPI: "ISDN / telephone numbering plan"

Address value: "10001"

TP-PID: USIM Data download

TP-DCS

Coding Group General Data Coding

Compression Text is uncompressed

Message Class: Class 2 (U)SIM Specific Message

Alphabet : 8 bit data

TP-SCTS: 01/01/98 00:00:00 +0

TP-UDL 109

TP-UD: 02 70 00 00 68 15 16 21 19 19 C0 00 00 4F F5 A4 61 BE 1E E9 C0 6A 62 44 15 23 47 DA 22 24 B8 87 27 CC F7 0B 32 38 B2 6D D2 E0 7F 18 33 5A 06 4E 5F C5 C1 44 F7 0E 17 68 51 41 09 D9 28 43 79 B3 65 16 F4 E0 6F E3 10 0A 04 C2 18 0B 64 D7 F8 7C 88 6D BB F1 D9 EC 39 0C 02 67 24 BB DC 7B 50 06 9A 22 15 6F FC 3F 04 1B EE E1 C7 04 33

SMS-PP Data Download UICC Acknowledgement

Test Procedure More Time

Step	Direction	Sequence	Expected Result
1	UICC → ME	PROACTIVE COMMAND PENDING: MORE TIME	
2	ME → UICC	FETCH	
3	UICC → ME	PROACTIVE COMMAND: MORE TIME	

Step	Direction	Sequence	Expected Result
4	ME → UICC	TERMINAL RESPONSE: MORE TIME	Command performed successfully.

PROACTIVE COMMAND: MORE TIME

Command details
Command number: 1
Command type: MoreTime
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: ME

TERMINAL RESPONSE: MORE TIME

Command details
Command number: 1
Command type: MoreTime
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully

12.3.3.9.5 Test Sequence No 4: (SMS-PP - Open channel - Send/Receive data - Send SM with More Time)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Test Procedure SMS-PP Data Download	as specified in 12.3.3.9.4.
2		Test Procedure Open Channel	as specified in 12.3.3.9.4.
3		Test Procedure Send Data	as specified in 12.3.3.9.4.
4		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
5		Test Procedure More Time	as specified in 12.3.3.9.4.
6		Test Procedure More Time	as specified in 12.3.3.9.4.

Step	Direction	Sequence	Expected Result
7		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
8		Test Procedure Timer Management (disable timer)	as specified in 12.3.3.9.4.
9		Test Procedure Send Data	as specified in 12.3.3.9.4.
10		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
11		Test Procedure Send SMS	as specified in 12.3.3.9.4.
12		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
13		Test Procedure Timer Management (disable timer)	as specified in 12.3.3.9.4.

12.3.3.9.6 Test Sequence No 5: (SMS-PP - Open channel - Send/Receive data - Send SM without More Time)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		Test Procedure SMS-PP Data Download	as specified in 12.3.3.9.4.
2		Test Procedure Open Channel	as specified in 12.3.3.9.4.
3		Test Procedure Send Data	as specified in 12.3.3.9.4.
4		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
5		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
6		Test Procedure Timer Management (disable timer)	as specified in 12.3.3.9.4.
7		Test Procedure Send Data	as specified in 12.3.3.9.4.
8		Test Procedure Timer Management (Start Timer)	as specified in 12.3.3.9.4.
9		Test Procedure Send SMS	as specified in 12.3.3.9.4.
10		Test Procedure Receive Data 1	as specified in 12.3.3.9.4.
11		Test Procedure Timer Management (disable timer)	as specified in 12.3.3.9.4.

12.3.3.10 Concurrent BIP channels

Test Purpose

To verify that the DUT supports two concurrent channels, BIP in client mode.

Referenced requirement

- TS26_NFC_REQ_080

Initial Conditions

None

12.3.3.10.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1		The 3GPP TS 31.124 "27.22.2 Contents of the TERMINAL PROFILE command" test SHALL be performed in order to check that the DUT declare to support two concurrent channels, BIP in client mode.	
2		The 3GPP TS 31.124 "27.22.4.27 Open Channel (related to GPRS)" test SHALL be performed in order to open a first channel BIP in client mode.	The Channel is correctly opened
3		Before the first channel is closed, and in order to open a second channel the 3GPP TS 31.124 "27.22.4.27 Open Channel (related to GPRS)" test SHALL be performed again in order to open a second channel BIP in client mode.	The Channel is correctly opened

12.3.3.11 Contents of the TERMINAL PROFILE

Direction: terminal to UICC.

Test Purpose

To verify the content of TERMINAL PROFILE for BIP in UDP client mode.

Referenced requirement

- TS26_NFC_REQ_080

Initial Conditions

The ME is connected to the UICC Simulator. All elementary files are coded as the default UICC Application Toolkit personalization.

12.3.3.11.1 Test Sequence No 1: (TERMINAL PROFILE – command for BIP in UDP, client mode)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	User → ME	Power on the ME.	
2	ME → UICC	Send the TERMINAL PROFILE command	After the ME sends the TERMINAL PROFILE command to the UICC Simulator, the UICC Simulator shall record the content of the TERMINAL PROFILE as mentioned below in Profile section
3	UICC → ME	UICC sends SW1 / SW2 of '90 00'.	The contents of the TERMINAL PROFILE is recorded and compared to the corresponding Byte 1, Byte 12, Byte 13 and Byte 17 as explained below.

The test is terminated upon the ME sending the TERMINAL PROFILE command to the UICC Simulator

Command parameters/data:

Description	Clause	M/O/C	Length
Profile	-	M	length

Profile:

- Contents:
  - The list of CAT facilities that are supported by the terminal.
- Coding:
  - 1 bit is used to code each facility:
    bit = 1: facility supported by terminal;
    bit = 0: facility not supported by terminal.
    (bit = x: not checked by the UICC Simulator)

The terminal shall indicate Profile download as SUPPORTED in the content of TERMINAL PROFILE at First byte to be used for BIP in UDP, client mode as shown below:

First byte (Download):

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
-	-	-	-	-	-	-	1	Profile download
-	-	-	-	-	-	X	-	Reserved by 3GPP (SMS-PP data download)
-	-	-	-	-	X	-	-	Reserved by 3GPP (Cell Broadcast data download)
-	-	-	-	X	-	-	-	Menu selection
-	-	-	X	-	-	-	-	Reserved by 3GPP (SMS-PP data download)
-	-	X	-	-	-	-	-	Timer expiration
-	X	-	-	-	-	-	-	Reserved by 3GPP and 3GPP2 (USSD string data object support in Call Control by USIM)
X	-	-	-	-	-	-	-	Call Control by NAA

The terminal shall indicate OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA and SEND DATA as SUPPORTED in the content of TERMINAL PROFILE at 12th byte to be used for BIP in UDP, client mode as shown below:

Twelfth byte (Bearer Independent protocol proactive commands, class "e"):

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
-	-	-	-	-	-	-	1	Proactive UICC: OPEN CHANNEL
-	-	-	-	-	-	1	-	Proactive UICC: CLOSE CHANNEL
-	-	-	-	-	1	-	-	Proactive UICC: RECEIVE DATA
-	-	-	-	1	-	-	-	Proactive UICC: SEND DATA Proactive
-	-	-	X	-	-	-	-	UICC: GET CHANNEL STATUS Proactive
-	-	X	-	-	-	-	-	UICC: SERVICESEARCH
-	X	-	-	-	-	-	-	Proactive UICC: GET SERVICE INFORMATION
X	-	-	-	-	-	-	-	Proactive UICC: DECLARE Service

The terminal shall indicate GPRS as SUPPORTED and Number of channels supported by terminal (Minimum = 1) in the content of TERMINAL PROFILE at 13th byte to be used for BIP in UDP, client mode as shown below:

Thirteenth byte (Bearer Independent protocol supported bearers, class "e"):

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
-	-	-	-	-	-	-	X	CSD
-	-	-	-	-	-	1	-	GPRS
-	-	-	-	-	X	-	-	Bluetooth
-	-	-	-	X	-	-	-	IrDA

-	-	-	X	-	-	-	-	RS232
-	-	x1	-	-	-	-	-	Number of channels supported by terminal
-	x2	-	-	-	-	-	-	Number of channels supported by terminal
x3	-	-	-	-	-	-	-	Number of channels supported by terminal

Number of channels coded by x1, x2 and x3 must be >0

The terminal shall indicate UDP, UICC in client mode as SUPPORTED in the content of TERMINAL PROFILE at 17th byte to be used for BIP in UDP, client mode as shown below:

Seventeenth byte (Bearer independent protocol supported transport interface/bearers, class "e"):

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
-	-	-	-	-	-	-	X	TCP, UICC in client mode, remote connection
-	-	-	-	-	-	1	-	UDP, UICC in client mode, remote connection
-	-	-	-	-	X	-	-	TCP, UICC in server mode
-	-	-	-	X	-	-	-	TCP, UICC in client mode, local connection (i.e. class "k" is supported)
-	-	-	X	-	-	-	-	UDP, UICC in client mode, local connection (i.e. class "k" is supported)
-	-	X	-	-	-	-	-	Direct communication channel (i.e. class "k" is supported)
-	X	-	-	-	-	-	-	Reserved by 3GPP (E-UTRAN)
X	-	-	-	-	-	-	-	Reserved by 3GPP (HSDPA)

12.3.3.12 OPEN CHANNEL - Terminal connected to Wi-Fi

Test Purpose

To verify OPEN CHANNEL for terminal connected to Wi-Fi, UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ 078

Initial Conditions

For Wi-Fi the test platform has to assure exclusive SSID which does not allow access except the DUT, same for login and password.

The DUT has to be connected to Wi-Fi

12.3.3.12.1 Test Sequence No 1: (OPEN CHANNEL, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)

Initial Conditions

Use Bearer Type '03'= default bearer for requested transport layer.

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for "Always on connection" (web.network.com).	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for "Always on connection" (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 12.3.3.12.1	
5	ME → UICC	FETCH	
6	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.12.1	
7	ME → User	The ME may display channel opening information	
8	ME → USS	PDP context activation request on the cellular network	
9	USS → ME	PDP context activation accept on the cellular network	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.12.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.12.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024
UICC/ME interface transport level
Transport format: UDP
Port number: 44444
Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.12.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel status Channel identifier 1 and link established or PDP context activated
Bearer description
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024

12.3.3.12.2 Test Sequence No 2: (OPEN CHANNEL, Terminal connected to Wi-Fi-APN empty-GPRS Bearer Type used)

Initial Conditions

Use **GPRS Bearer Type** for requested transport layer.

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for “Always on connection” (web.network.com).	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.

Step	Direction	Sequence	Expected Result
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for “Always on connection” (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 12.3.3.12.2	
5	ME → UICC	FETCH	
6	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.12.2	
7	ME → User	The ME may display channel opening information	
8	ME → USS	PDP context activation request	
9	USS → ME	PDP context activation accept	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.12.2	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.12.2

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: GPRS/ UTRAN packet service/E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.12.2

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer

Bearer type: GPRS/ UTRAN packet service/E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

12.3.3.13 CLOSE CHANNEL – Terminal connected to Wi-Fi

Test Purpose

To verify CLOSE CHANNEL for terminal connected to Wi-Fi, UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

For Wi-Fi the test platform has to assure exclusive SSID which does not allow access except the DUT, same for login and password.

12.3.3.13.1 Test Sequence No 1: (CLOSE CHANNEL, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)

Initial Conditions

Use Bearer Type '03' = default bearer for requested transport layer.

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for "Always on connection" (web.network.com).	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for "Always on connection" (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL12.3.3.13.1	
5	ME → UICC	FETCH	
6	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.13.1	
7	ME → User	The ME may display channel opening information	
8	ME → USS	PDP context activation request	
9	USS → ME	PDP context activation accept	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.13.1	[Command performed successfully]
11	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 12.3.3.13.1	
12	ME → UICC	FETCH	
13	UICC →	PROACTIVE COMMAND: CLOSE	

	ME	CHANNEL 12.3.3.13.1	
14	ME → USS	PDP context deactivation request	
15	USS → ME	PDP context deactivation accept	
16	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 12.3.3.13.1	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.13.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer Type

Buffer

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.13.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024

PROACTIVE COMMAND: CLOSE CHANNEL 12.3.3.13.1

Command details
Command number: 1
Command type: CLOSE CHANNEL
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1

TERMINAL RESPONSE: CLOSE CHANNEL 12.3.3.13.1

Command details
Command number: 1
Command type: CLOSE CHANNEL
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully

12.3.3.13.2 Test Sequence No 2: (CLOSE CHANNEL, Terminal connected to Wi-Fi-APN empty-GPRS Bearer Type used)

Initial Conditions

Use **GPRS Bearer Type** for requested transport layer.

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for “Always on connection” (web.network.com).	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.

Step	Direction	Sequence	Expected Result
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for “Always on connection” (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 12.3.3.13.2	
5	ME → UICC	FETCH	
6	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.13.2	
7	ME → User	The ME may display channel opening information	
8	ME → USS	PDP context activation request	
9	USS → ME	PDP context activation accept	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.13.2	[Command performed successfully]
11	UICC → ME	PROACTIVE COMMAND PENDING: CLOSE CHANNEL 12.3.3.13.2	
12	ME → UICC	FETCH	
13	UICC → ME	PROACTIVE COMMAND: CLOSE CHANNEL 12.3.3.13.2	
14	ME → USS	PDP context deactivation request	
15	USS → ME	PDP context deactivation accept	
16	ME → UICC	TERMINAL RESPONSE CLOSE CHANNEL 12.3.3.13.2	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.13.2

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device:ME

Bearer

Bearer type: GPRS/ UTRAN packet service/E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05

Mean throughput class: 31

Packet data protocol: 02 (IP)

Buffer

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.13.2

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: GPRS/ UTRAN packet service/E-UTRAN

Bearer parameter:

Precedence Class: 02

Delay Class: 04

Reliability Class: 02

Peak throughput class: 05
Mean throughput class: 31
Packet data protocol: 02 (IP)

Buffer
Buffer size: 1024

PROACTIVE COMMAND: CLOSE CHANNEL 12.3.3.13.2

Logically:

Command details
Command number: 1
Command type: CLOSE CHANNEL
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1

TERMINAL RESPONSE: CLOSE CHANNEL 12.3.3.13.2

Logically:

Command details
Command number: 1
Command type: CLOSE CHANNEL
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully

12.3.3.14 RECEIVE DATA – Terminal connected to Wi-Fi

Test Purpose

To verify RECEIVE DATA related to Default (network) Bearer, for terminal connected to Wi-Fi, UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

For the Wi-Fi the test platform has to assure exclusive SSID which does not allow access except the DUT, same for login and password.

12.3.3.14.1 Test Sequence No 1: (RECEIVE DATA, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for “Always on connection” (web.network.com).	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for “Always on connection” (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 12.3.3.14.1 PENDING	
5	ME → UICC	FETCH	
6	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST12.3.3.14.1	
7	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 12.3.3.14.1	
8	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 12.3.3.14.1	
9	ME → UICC	FETCH	
10	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.14.1	
11	ME → User	The ME may display channel opening information	
12	ME → USS	PDP context activation request	
13	USS → ME	PDP context activation accept	
14	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.14.1	[Command performed successfully]
15	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 12.3.3.14.1	

Step	Direction	Sequence	Expected Result
16	ME → UICC	FETCH	
17	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 12.3.3.14.1	
18	ME → USS	Transfer 8 Bytes of data to the USS through channel 1	[To retrieve ME's port number]
19	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 12.3.3.14.1	[Command performed successfully]
20	USS → ME	Transfer 1024 Bytes of data to the ME through channel 1 using the ME's port number, which was retrieved in step 18	
21	ME → UICC	ENVELOPE: EVENT DOWNLOAD - Data available 12.3.3.14.1	(1024 Bytes of data in the ME buffer)
22	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 12.3.3.14.1	
23	ME → UICC	FETCH	
24	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.1	205 Bytes
25	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.1	
26	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 12.3.3.14.2	
27	ME → UICC	FETCH	
28	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.2	205 Bytes
29	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.2	
30	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 12.3.3.14.3	
31	ME → UICC	FETCH	
32	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.3	205 Bytes
33	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.3.3.12.3.3	

Step	Direction	Sequence	Expected Result
34	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 12.3.3.14.4	
35	ME → UICC	FETCH	205 Bytes
36	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.4	
37	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.4	
38	UICC → ME	PROACTIVE COMMAND PENDING: RECEIVE DATA 12.3.3.14.5	
39	ME → UICC	FETCH	204 Bytes
40	UICC → ME	PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.5	
41	ME → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.5	

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.14.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer

Bearer type: Default Bearer Type

Buffer

Buffer size: 1024

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.14.1

Command details

Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel status Channel identifier 1 and link established or PDP context activated
Bearer description
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024

PROACTIVE COMMAND: SET UP EVENT LIST 12.3.3.14.1

Command details
Command number: 1
Command type: SET UP EVENT LIST
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: ME
Event list Data available

TERMINAL RESPONSE: SET UP EVENT LIST 12.3.3.14.1

Command details
Command number: 1
Command type: SET UP EVENT LIST
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully

PROACTIVE COMMAND: SEND DATA 12.3.3.14.1

Command details
- Command number: 1
- Command type: SEND DATA
- Command qualifier: Send Immediately

Device identities
- Source device: UICC
- Destination device: Channel 1

Channel Data
- Channel Data: 00 01 .. 07 (8 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.14.1

Command details
- Command number: 1
- Command type: SEND DATA
- Command qualifier: Send Immediately

Device identities
- Source device: ME
- Destination device: UICC

Result
- General Result: Command performed successfully
- Channel data length: More than 255 bytes of space available in the Tx buffer

ENVELOPE: EVENT DOWNLOAD - Data available 12.3.3.14.1

Event list
- Event: Data available

Device identities
- Source device: ME
- Destination device: UICC

Channel status
- Channel status: Channel 1 open, link established

Channel Data Length
- Channel data length: FF (more than 255 bytes are available)

PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.1

Command details

Command number: 1
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.2

Command details
Command number: 2
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.3

Command details
Command number: 3
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.4

Command details
Command number: 4
Command type: RECEIVE DATA
Command qualifier: RFU

Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 205

PROACTIVE COMMAND: RECEIVE DATA 12.3.3.14.5

Command details
Command number: 5
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data Length
Channel Data Length: 204

TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.1

Command details
Command number: 1
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel Data : 00 01 02 .. CC (205 Bytes of data)
Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.2

Command details
Command number: 2
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities

Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel Data : CD CE CF .. FF 00 01 .. 99(205 Bytes of data)
Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.3

Command details
Command number: 3
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel Data : 9A 9B .. FF 00 01 – 66 (205 Bytes of data)
Channel data length: FF

TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.4

Command details
Command number: 4
Command type: RECEIVE DATA
Command qualifier: RFU
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel Data : 67 68 .. FF 00 01 .. 33 (205 Bytes of data)
Channel data length: CC

TERMINAL RESPONSE: RECEIVE DATA 12.3.3.14.5

Command details
Command number: 5

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data: 34 35 .. FF (204 Bytes of data)

Channel data length: 00

12.3.3.15 SEND DATA - Terminal connected to Wi-Fi

Test Purpose

To verify SEND DATA related to Default (network) Bearer, for terminal connected to Wi-Fi, UICC in client mode for UDP

Referenced requirement

- TS26_NFC_REQ_078

Initial Conditions

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

For the Wi-Fi the test platform has to assure exclusive SSID which does not allow access except the DUT, same for login and password.

12.3.3.15.1 Test Sequence No 1: (SEND DATA, Terminal connected to Wi-Fi-APN empty-Default Bearer Type used)

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	ME	Connect ME to the USS and establish the first PDN to the APN for “Always on connection” (web.network.com) .	Indication to the test operator required to configure the ME for the establishment of the first PDN connection to the desired APN after registration.
2	ME	Connect ME to the local Wi-Fi hot spot	Wi-Fi needs to be turned ON after first PDN registration
3	ME	Disconnect ME from the first APN for “Always on connection” (web.network.com)	
4	UICC → ME	PROACTIVE COMMAND PENDING: OPEN CHANNEL 12.3.3.15.1	
5	ME → UICC	FETCH	

Step	Direction	Sequence	Expected Result
6	UICC → ME	PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.15.1	
7	ME → UICC	The ME may display channel opening information	
8	ME → USS	PDP context activation request	
9	USS → ME	PDP context activation accept	
10	ME → UICC	TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.15.1	[Command performed successfully]
11	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 12.3.3.15.1	
12	ME → UICC	FETCH	
13	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 12.3.3.15.1	Send 1024 Bytes of data by packets of 205 Bytes
14	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 12.3.3.15.1	[Command performed successfully]
15	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 12.3.3.15.2	
16	ME → UICC	FETCH	
17	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 12.3.3.15.2	[205 Bytes]
18	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 12.3.3.15.2	[Command performed successfully]
19	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 12.3.3.15.3	
20	ME → UICC	FETCH	
21	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 12.3.3.15.3	[205 Bytes]
22	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 12.3.3.15.3	[Command performed successfully]
23	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA 12.3.3.15.4	
24	ME → UICC	FETCH	
25	UICC → ME	PROACTIVE COMMAND: SEND DATA (store mode) 12.3.3.15.4	[205 Bytes]

Step	Direction	Sequence	Expected Result
26	ME → UICC	TERMINAL RESPONSE: SEND DATA (store mode) 12.3.3.15.4	[Command performed successfully]
27	UICC → ME	PROACTIVE COMMAND PENDING: SEND DATA12.3.3.15.5	
28	ME → UICC	FETCH	
29	UICC → ME	PROACTIVE COMMAND: SEND DATA (immediate) 12.3.3.15.5	[204 Bytes]
30	ME → USS	Transfer 1024 Bytes of data to the USS through channel 1	
31	ME → UICC	TERMINAL RESPONSE: SEND DATA (immediate) 12.3.3.15.5	[Command performed successfully]

PROACTIVE COMMAND: OPEN CHANNEL 12.3.3.15.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities
Source device: UICC
Destination device: ME
Bearer
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024
UICC/ME interface transport level
Transport format: UDP
Port number: 44444
Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.3.3.15.1

Command details
Command number: 1
Command type: OPEN CHANNEL
Command qualifier: immediate link establishment
Device identities

Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel status Channel identifier 1 and link established or PDP context activated
Bearer description
Bearer type: Default Bearer Type
Buffer
Buffer size: 1024

PROACTIVE COMMAND: SEND DATA 12.3.3.15.1

Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data
Channel Data : 00 01 02 .. CC (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.15.1

Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 12.3.3.15.2

Command details
Command number: 1

Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data
Channel Data : CD CE CF .. FF 00 01 .. 99(205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.15.2

Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 12.3.3.15.3

Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data
Channel Data : 9A 9B .. FF 00 01 .. 66 (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.15.3

Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode

Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel data length: More than 255 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 12.3.3.15.4
Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: UICC
Destination device: Channel 1
Channel Data
Channel Data : 67 68 .. FF 00 01 .. 33 (205 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.15.4
Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Store mode
Device identities
Source device: ME
Destination device: UICC
Result
General Result: Command performed successfully
Channel data length: 204 bytes of space available in the Tx buffer

PROACTIVE COMMAND: SEND DATA 12.3.3.15.5
Command details
Command number: 1
Command type: SEND DATA
Command qualifier: Send Immediately
Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 34 35 .. FF (204 Bytes of data)

TERMINAL RESPONSE: SEND DATA 12.3.3.15.5

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer.

12.4 Remote Management use cases

12.4.1 General overview

This section addresses testing of selected use cases for NFC services in environment with possible real data transfer in place.

The list of conformance requirements tested within this section is listed in the table in section 12.4.2.

12.4.2 Conformance requirements

TS26_NFC_REQ_078	The mobile device SHALL support BIP in UICC client mode for UDP.
TS26_NFC_REQ_079	The mobile device SHALL support BIP in UICC client mode for TCP.
TS26_NFC_REQ_081	The mobile device SHALL support the SMS push (per ETSI TS 102 226 and 3GPP TS 31.116) to establish an open BIP channel as per ETSI TS 102 223 Open Channel Command
TS26_NFC_REQ_120	The device SHALL support the BIP session regardless of incoming or outgoing calls, incoming or outgoing MMS, SMS. Note: This is not applicable if the device is on a 2G network.

12.4.3 Test Cases

12.4.3.1 Contactless transaction during BIP session

Test Purpose

To ensure that the device is able to perform contactless transaction during a CAT-TP/BIP session

Referenced requirement

- TS26_NFC_REQ_078

12.4.3.1.1 Test Sequence No 1: Receiving or send a SMS during BIP data transfer

Initial Conditions

- **ReferenceApplication.cap** managing the reference transaction with AID_REF selectable into the reference UICC.
- **APDU Application** to send APDUs according to the reference transaction.

Step	Direction	Sequence	Expected Result
1	DUT → UICC	Send Fetch OPEN CHANNEL command	
2	UICC → DUT	OPEN CHANNEL 1.1	
3	DUT → UICC	TERMINAL RESPONSE: OPEN CHANNEL	TR Open Channel successful + SW = 91xx
4		Fetch Send Data (CATTP SYN command for Link establishment)	TR Successful + 90 00
5		Send Event Data Available to the UICC (Reception of CATTP SYN-ACK)	91 XX
6	DUT → UICC	Fetch Receive Data	TR Successful + 91 XX
7		Fetch Send Data (ACK-PDU)	Ask server for downloading data
8	DUT → UICC	Send Event Data Available to the UICC (Reception of data from the server)	91 FF
9	DUT → UICC	Fetch Receive Data (with 0xFF data)	TR Successful + 91 FF
10	DUT → UICC	Fetch Receive Data (with 0xFF data)	TR Successful + 91 FF
11		Execute the **reference transaction** in loop mode (5 loops)	The DUT must manage the reference transaction at least 5 transaction done consecutively without any loss.
12	DUT → UICC	Fetch Receive Data (with 0xFF data)	TR Successful + 91 yy (last Bytes)
13		Fetch Receive Data (with 0x'yy' data)	TR Successful + 91 zz
14		Fetch Send Data store data in Tx	TR Successful + 90 00

Step	Direction	Sequence	Expected Result
		buffer (with 0x'zz' data)	
15		Send Event Data Available to the UICC	
16		Fetch Receive Data (with 0xFF data)	TR Successful + 91 FF
17	DUT → UICC	Fetch Receive Data (with 0xFF data)	TR Successful + 91 yy (last Bytes)
18		Fetch Receive Data (with 0x'yy' data)	TR Successful + 91 zz
19		Fetch Send Data immediate	TR Successful + 90 00
20		Send Event Data Available to the UICC	
21		Fetch Receive Data (with 0xFF data)	TR Successful + 91 FF
22		Fetch Receive Data (with 0xFF data)	TR Successful + 91 yy (last Bytes)
23		Fetch Receive Data (with 0x'yy' data)	TR Successful + 91 zz
24		Fetch Send Data immediate	TR Successful + 91 xx
25		Fetch Close Channel	TR Successful + 90 00

PROACTIVE COMMAND: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: ME

Bearer description

Bearer type: 03 Default Bearer for requested transport layer

Buffer

Buffer size: 1400

Text String: UserLog (User login)

Text String: UserPwd (User password)

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 1.1

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel status Channel identifier 1 and link established or PDP context activated

Bearer description

Bearer type: 03 Default Bearer for requested transport layer

Buffer

Buffer size: 1400

12.4.3.2 OTA Data Loading

Test Purpose

Ensure that the Baseband can support the OTA data Loading

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_079
- TS26_NFC_REQ_081
- TS26_NFC_REQ_120

Initial Conditions

- A test data with a size of 60k Bytes to induce OTA Load duration in CAT-TP
- Set up a network simulator for the appropriate radio access technology as defined in chapter 2.5.8.
- Also, the DUT with a test phone number which can be called and permits to maintain the call for several minutes is necessary.
- Simulated UICC is connected to the DUT
- Prior to this test the DUT shall have been powered ON and ISO7816 initialization has been completed.

- Test shall be made based on the capability of the DUT (Example: For LTE device, test shall use LTE; otherwise, use 3G).

12.4.3.2.1 Test Sequence No 1: Receiving and accepting a voice call during BIP CAT-TP data transfer

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

immediate Link establishment,

Bearer Type 03 (Default Bearer for requested transport layer),

No Alpha Identifier

Step	Direction	Sequence	Expected Result
1	Server → DUT	Perform Push SMS procedure as defined in section 12.4.3.7.1	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1 The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of 0xFF)	
5	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the start of the expected data from the server. 91 XX
6		During CATTP data transfer, Receive and accept an incoming voice call. Operate the Call for the whole test sequence.	Voice call established
7		Repeat steps 8 to 9 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT	

Step	Direction	Sequence	Expected Result
		DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
8	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
9	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the remainder of the expected data from the server. 91 XX
10	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
11	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

PROACTIVE COMMAND: SEND DATA 12.1

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data

Channel Data: 00 01 .. 07 (8 Bytes of data) (or other data as specified in the referencing test procedure)

TERMINAL RESPONSE: SEND DATA 12.1

Logically:

Command details

Command number: 1

Command type: SEND DATA

Command qualifier: Send Immediately

Device identities

Source device: DUT

Destination device: UICC

Result

General Result: Command performed successfully

Channel data length: More than 255 bytes of space available in the Tx buffer

ENVELOPE: EVENT DOWNLOAD - Data available 12.1

Logically:

Event list

Event: Data available

Device identities

Source device: DUT

Destination device: UICC

Channel status

Channel status: Channel 1 open, link established

Channel Data Length

Channel data length: FF (more than 255 bytes are available)

PROACTIVE COMMAND: RECEIVE DATA 12.1

Logically:

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel 1

Channel Data Length

Channel Data Length: 200 (or other value as specified in the referencing test procedure)

TERMINAL RESPONSE: RECEIVE DATA 12.1

Logically:

Command details

Command number: 1

Command type: RECEIVE DATA

Command qualifier: RFU

Device identities

Source device: ME

Destination device: UICC

Result

General Result: Command performed successfully

Channel Data : 00 01 02 .. C7 (Segmented Bytes of data) (or other data as specified in the referencing test procedure)

Channel data length: FF (for the last TERMINAL RESPONSE: RECEIVE DATA the channel data length should be 00)

PROACTIVE COMMAND: CLOSE CHANNEL 12.1

Logically:

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: UICC

Destination device: Channel

TERMINAL RESPONSE: CLOSE CHANNEL 12.1

Logically:

Command details

Command number: 1

Command type: CLOSE CHANNEL

Command qualifier: RFU

Device identities

Source device: DUT

Destination device: UICC

Result

General Result: Command performed successfully

12.4.3.2.2 VOID

Covered by section 12.4.3.2.1

12.4.3.2.3 Test Sequence No 3: Voice Call made from the device during BIP CAT-TP session

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.1	
2	Server → DUT	Transfer of 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1 The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of 0xFF)	
5	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the start of the expected data from the server. 91 XX
6		During CATTP data transfer, Start a voice call to a test phone number and Receive the call. Operate the Call for the whole test sequence	Voice call established
7		Repeat steps 8 to 9 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available	

Step	Direction	Sequence	Expected Result
		commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
8	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with with channel data length of YY according to the amount of data available)	
9	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the remainder of the expected data from the server. 91 XX
10	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
11	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as, ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

12.4.3.2.4 VOID

Covered by section 12.4.3.2.3

12.4.3.2.5 Test Sequence No 5: BIP CAT-TP data transfer during a Voice Call is established

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer),

No alpha identifier

Step	Direction	Sequence	Expected Result
1		Start the test by Receiving and accepting an incoming voice call over 2G/3G. Operate the call for the whole test sequence.	Voice call established
2	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.1	
3	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 2. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
4	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
5		Repeat steps 6 to 7 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
6	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
7	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server.

Step	Direction	Sequence	Expected Result
			91 XX
8	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
9	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as, ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

12.4.3.2.6 VOID

Covered by section 12.4.3.2.5

12.4.3.3 OTA Data Loading with and without *proof of Receipt* (PoR)

Test Purpose

Ensure that the mobile device supports the OTA data Loading with and without proof of Receipt (PoR) request by the OTA server.

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_081

Initial Conditions

- A test data with a size of 60k Bytes to induce OTA data transfer
- Set up a network simulator for the appropriate radio access technology as defined in chapter 2.5.8.
- Also, a test phone number which may be called and which permits to maintain the call during several minutes is necessary.

- Simulated UICC is connected to the DUT
- Prior to this test the DUT shall have been powered ON and ISO7816 initialization has been completed.
- Test shall be made based on the capability of the DUT (Example: For LTE device, test shall use LTE; otherwise, use 3G).

12.4.3.3.1 Test Sequence No 1: OTA data loading without PoR requested by OTA server

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Test UICC should be configured to No PoR.

Immediate Link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT→ Server	Perform Push SMS procedure as defined in section 12.4.3.7.1	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1 The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX

Step	Direction	Sequence	Expected Result
4		Repeat steps 5 to 6 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
5	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
6	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
7	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
8	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically:

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1

Same as ENVELOPE: EVENT DOWNLOAD – Data available 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

12.4.3.3.2 Test Sequence No 2: OTA data loading with PoR requested by OTA server

Initial Conditions

Set up a network simulator for supported network technology as defined in section 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT→ Server	Perform Push SMS procedure as defined in section 12.4.3.7.2	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1 The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4		Repeat steps 5 to 6 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
5	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
6	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
7	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
8	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically:

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1

Same as ENVELOPE: EVENT DOWNLOAD – Data available 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

12.4.3.3.3 Test Sequence No 3: OTA data loading with PoR requested by OTA server when the device is booting

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier

Step	Direction	Sequence	Expected Result
1		Switch Off the device	
2	Server → DUT DUT → Server	Perform a Push SMS procedure as defined in section 12.4.3.7.2	
3	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 2. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
4	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
5		Repeat steps 6 to 7 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive	

Step	Direction	Sequence	Expected Result
		PROACTIVE COMMAND: Receive Data commands.	
6	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
7	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
8	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
9	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1

Same as ENVELOPE: EVENT DOWNLOAD – Data available 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL REPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL REPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

12.4.3.3.4 Test Sequence No 4: OTA data loading with PoR requested by OTA server after the device comes back from airplane mode

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha Identifier

Step	Direction	Sequence	Expected Result
1		Activate the airplane mode of the test device.	

Step	Direction	Sequence	Expected Result
2	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.2	
3	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 2. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
4	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
5		Repeat steps 6 to 7 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
6	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
7	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
8	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
9	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1

Same as ENVELOPE: EVENT DOWNLOAD – Data available 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

12.4.3.3.5 Test Sequence No 5: OTA data loading with PoR requested by OTA server only on error

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Immediate link establishment,

Bearer Type 03 (Default Bearer for requested transport layer)

No alpha identifier.

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT → Server	Perform Push SMS procedure with SPI '12 22' as defined in section 12.4.3.7.1 with SPI set to '12 22' (PoR only on error)	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4		Repeat steps 5 to 6 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD –Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	

Step	Direction	Sequence	Expected Result
5	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
6	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
7	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
8	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1

Same as ENVELOPE: EVENT DOWNLOAD – Data available 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1

12.4.3.4 Secure Element Access during BIP session

Test Purpose

To ensure that the device is able to perform Secure Element Access during a BIP session

Referenced requirement

- TS26_NFC_REQ_078

12.4.3.4.1 Test Sequence No 1

Initial Conditions

Set up a network simulator supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

- APDU_TestApplication.cap implements the sequence used by the MobileApplication.
- MobileApplication to call Secure Element Access APIs for open channel and Send APDU. This Application has full access to all AIDs.

The UICC simulator is connected to the DUT

- The following configuration is loaded into the UICC:
- PKCS#15 ADF with a DODF present and valid
- an ACMF is present and valid
- an ACRF is present and valid and contains a rule for all other AIDs and a path for
- one ACCF containing an empty hash condition.

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.1 or 12.4.3.7.2	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of 0xFF)	
5	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the start of the expected data from the server. 91 XX
6		Execute the **MobileApplication** in loop mode (20 loops) sending APDUs simultaneously, APDU Case 1, Case 2, Case 3, Case 4 .	APDU Case 1 and 3: 90 00 APDU Case 2 and 4: Data field of 0xFF bytes+ 9000
7		Repeat steps 8 to 9 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD – Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	

Step	Direction	Sequence	Expected Result
8	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
9	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the remainder of the expected data from the server. 91 XX
10	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
11	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL REPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

12.4.3.5 SMS and Internet Connection during OTA data loading.

Test Purpose

Ensure that the mobile device supports the OTA data Loading during receiving/sending SMS

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_081
- TS26_NFC_REQ_120

Initial Conditions

- A test data with a size of 60k Bytes to induce OTA data transfer
- Set up a network simulator for the appropriate radio access technology as defined in chapter 2.5.8.
- Also, a test phone number which may be called and which permits to maintain the call during several minutes is necessary.
- Simulated UICC is connected to the DUT

- Prior to this test the DUT shall have been powered ON and ISO7816 initialization has been completed.
- Test shall be made based on the capability of the DUT (Example: For LTE device, test shall use LTE; otherwise, use 3G).

12.4.3.5.1 Test Sequence No 1: Receiving and send a SMS during BIP data transfer

Initial Conditions

Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Step	Direction	Sequence	Expected Result
1	Server → DUT DUT → Server	Perform Push SMS procedure as defined in section 12.4.3.7.1 or 12.4.3.7.2	
2	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 1. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
3	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
4	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of 0xFF)	
5	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the start of the expected data from the server. 91 XX
6		Send SMS from DUT to test phone number. Receive SMS from test phone number on DUT.	SMS Sent and Received
7		Repeat steps 8 to 9 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD – Data Available	

Step	Direction	Sequence	Expected Result
		commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
8	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
9	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the remainder of the expected data from the server. 91 XX
10	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
11	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL REPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

12.4.3.6 OTA Loading of a Cardlet on SYN retry (simulate loss of PDUs).

Test Purpose

Ensure that the mobile device supports the OTA Loading of a Cardlet on SYN retry (simulate loss of PDUs) by the OTA server.

Referenced requirement

- TS26_NFC_REQ_078
- TS26_NFC_REQ_081

Initial Conditions

- A test Cardlet with a size of 60k Bytes to induce OTA Load duration in CAT-TP.
- Set up a network simulator for the appropriate radio access technology as defined in chapter 2.5.8.
- A UICC simulator on which the test Cardlet is not installed is inserted or connected to the DUT.
- Prior to this test the DUT shall have been powered ON and ISO7816 initialization has been completed.
- Test shall be made based on the capability of the DUT (Example: For LTE device, test shall use LTE, otherwise use 3G).

12.4.3.6.1 Test Sequence No 1: OTA Loading with SYN retry (simulate loss of PDUs) by OTA server

Initial Conditions
Set up a network simulator for supported network technology as defined in chapter 2.5.8.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Immediate link establishment

Bearer type 03 (Default Bearer for requested transport layer)

No alpha identifier

Wi-Fi disabled on the DUT

Step	Direction	Sequence	Expected Result
1	Server → DUT	Send “PUSH SMS” (content see below) with two commands: - “Request for BIP channel opening” as defined in TS 102 226 and TS 102 223.The SPI parameter is set to "12 21" in the SMS open channel push - “Request for CAT_TP link establishment” as defined in TS 102 226 [23] and TS 102 127 [24]	ENVELOPE (SMS-PP DOWNLOAD), forwarding the PUSH SMS to the UICC
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	

Step	Direction	Sequence	Expected Result
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → DUT	PROACTIVE COMMAND: OPEN CHANNEL 12.1	• Open PDN connection TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
7		Repeat steps 8 to 10 three times	
8	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (SYN PDU)	• Transfer data to the network through channel 1 to retrieve DUT's port number. • TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
9	Server	Simulate loss of PDUs by the Server (NO SYN-ACK PDU, link response sent to DUT)	Note: Nothing to be transmitted from the Server
10	UICC	Wait for one second	
11	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (SYN PDU)	• Transfer 8 Bytes of data to the network through channel 1 to retrieve DUT's port number. • TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
12	Network → DUT	Transmit SYN/ACK Packet	ENVELOPE(EVENT DOWNLOAD – Data Available 12.1)
13	UICC → DUT	PROACTIVE COMMAND: RECEIVE DATA 12.1 (SYN/ACK PDU)	TERMINAL RESPONSE (Command performed successfully, '91 xx')
14	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (ACK PDU)	• Transfer ACK Packet into network • TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
15	UICC → DUT	PROACTIVE COMMAND: SEND SHORT MESSAGE(PoR)	• Transfer PoR into network • TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1

Step	Direction	Sequence	Expected Result
16	Server → DUT	Transfer 60k Bytes of data to the DUT through channel 1 using the DUT's port number, which was retrieved within step 8. The data shall be constructed such that each portion of the data can be unambiguously identified when received by the UICC.	
17	DUT → UICC	ENVELOPE: EVENT DOWNLOAD – Data Available (Reception of data from the server, 60K Bytes of data in the DUT buffer)	91 XX
18		Repeat steps 19 to 20 until the complete 60k Bytes of data have been received by the UICC. Additional ENVELOPE: EVENT DOWNLOAD – Data Available commands may be sent by the DUT in between successive PROACTIVE COMMAND: Receive Data commands.	
19	UICC → DUT	PROACTIVE COMMAND: Receive Data 12.1 (with channel data length of YY according to the amount of data available)	
20	DUT → UICC	TERMINAL RESPONSE: RECEIVE DATA 12.1	TR Successful Channel data contains the expected data from the server. 91 XX
21	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
22	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

12.4.3.7 Link Establishment using Push SMS

Test Purpose

To ensure that the device establishes a connection to a given remote management server on request by an appropriate Push SMS

Referenced requirement

- TS26_NFC_REQ_081

12.4.3.7.1 Test Sequence No 1: OPEN CHANNEL on receiving Push SMS without PoR

Initial Conditions

Set up a network simulator for LTE, terminal is authenticating against LTE.

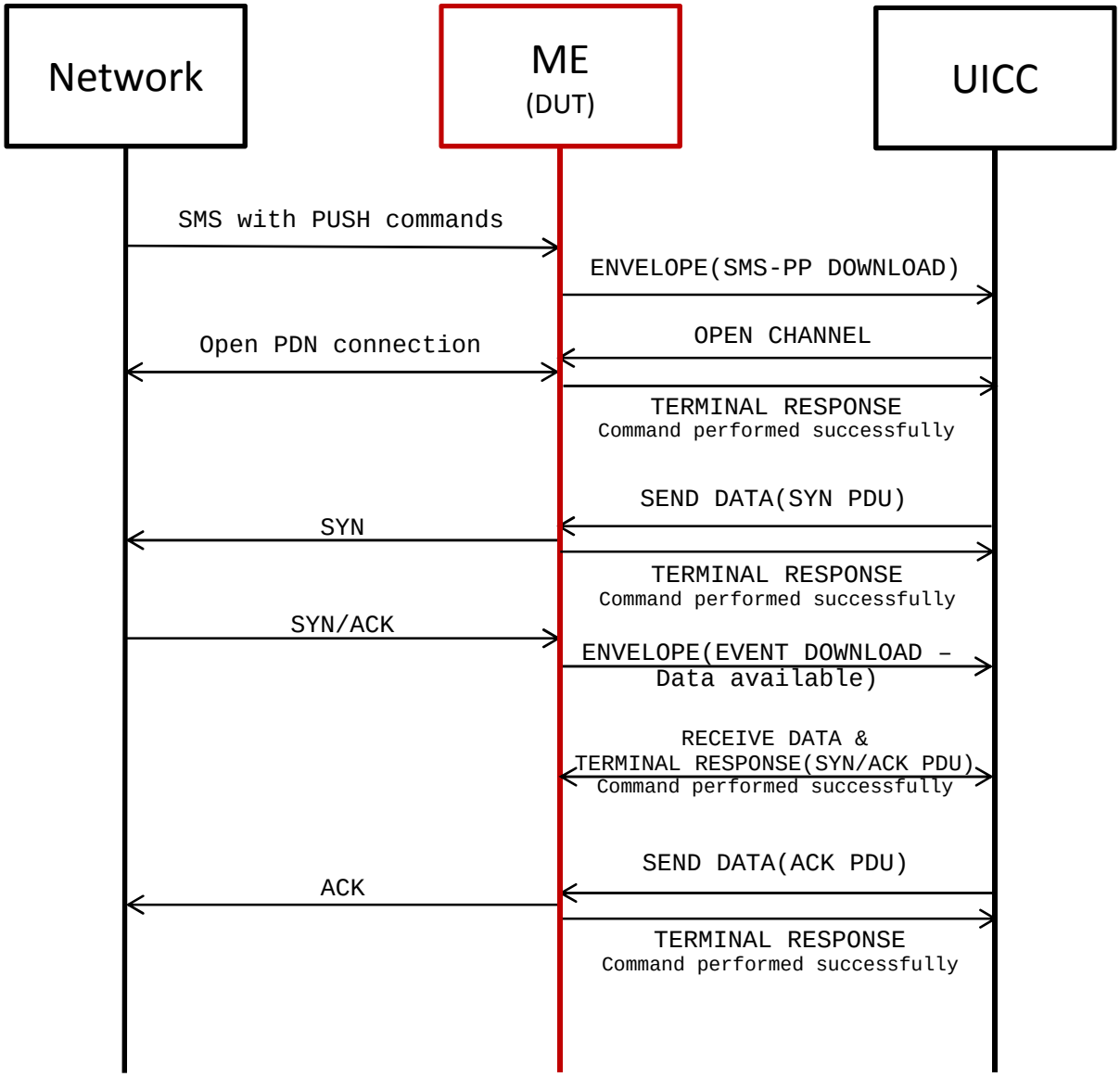
If PUSH SMS is sent through IMS over LTE: Set up an IMS server, DUT is registering with IMS in order to receive and send SMS.

If PUSH SMS is sent through 2G/3G network: Set up a network simulator for 2G/3G, terminal is authenticating against 2G/3G in order to receive and send SMS.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Test UICC should send no PoR.

Test Environment



Test Procedure

(With APN, immediate link establishment, Bearer type 03 (Default Bearer for requested transport layer), no alpha identifier)

Step	Direction	Sequence	Expected Result
1	Network → DUT	Send "PUSH SMS" (content see below) with two commands: - "Request for BIP channel opening" as defined in TS 102 226 and TS 102 223. The SPI parameter is set to "12 00" in the sms open channel push - "Request for CAT_TP link establishment" as defined in TS 102 226 [23] and TS 102 127 [24]	ENVELOPE(SMS-PP DOWNLOAD), forwarding the PUSH SMS to the UICC
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → DUT	PROACTIVE COMMAND: OPEN CHANNEL 12.1	- Open PDN connection - TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
7	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (SYN PDU)	- Transfer data to the network through channel 1 to retrieve DUT's port number. - TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
8	Network → DUT	Transmit SYN/ACK Packet	ENVELOPE(EVENT DOWNLOAD - Data available 12.1)
9	UICC → DUT	PROACTIVE COMMAND: RECEIVE DATA 12.1 (SYN/ACK PDU)	TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
10	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (ACK PDU)	- Transfer ACK Packet into network - TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1

Step	Direction	Sequence	Expected Result
11		If test case 12.4.3.7.1 is being executed directly, proceed to step 12. Otherwise (if this procedure is being performed as part of a different test case), the execution of this procedure is complete.	
12	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
13	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

PROACTIVE COMMAND: OPEN CHANNEL 12.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities

Source device: UICC

Destination device: DUT

Bearer description

Bearer type: 03 Default Bearer for requested transport layer

Buffer

Buffer size: 1400

UICC/ME interface transport level

Transport format: UDP

Port number: 44444

Data destination address: 01.01.01.01

TERMINAL RESPONSE: OPEN CHANNEL 12.1

Logically:

Command details

Command number: 1

Command type: OPEN CHANNEL

Command qualifier: immediate link establishment

Device identities
Source device: DUT
Destination device: UICC
Result
General Result: Command performed successfully
Channel status Channel identifier 1 and link established or PDP context activated
Bearer description
Bearer type: 03 Default Bearer for requested transport layer
Buffer
Buffer size: 1400

Same as PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 in clause 11.3.3.1.
Same as TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1 in clause 11.3.3.1.

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.
Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as, ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE DATA 12.1 in clause 12.4.3.2.1.
Same as TERMINAL RESPONSE: RECEIVE DATA 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.
Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

12.4.3.7.2 Test Sequence No 2: OPEN CHANNEL on receiving Push SMS, with PoR

Initial Conditions

Set up a network simulator for LTE, terminal is authenticating against LTE.

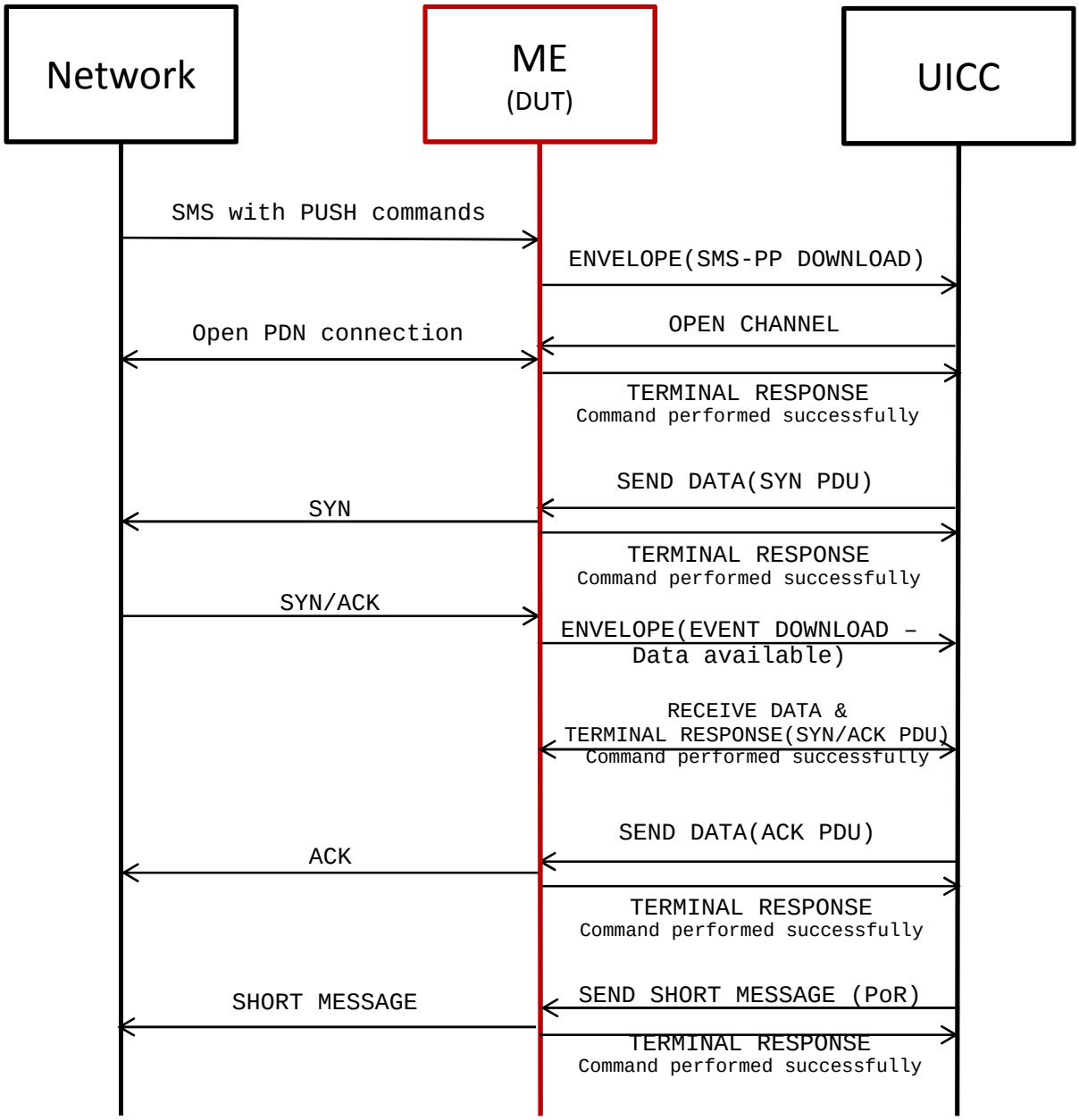
If PUSH SMS is sent through IMS over LTE: Set up an IMS server, DUT is registering with IMS in order to receive and send SMS.

If PUSH SMS is sent through 2G/3G network: Set up a network simulator for 2G/3G, terminal is authenticating against 2G/3G in order to receive and send SMS.

One default APN is configured on the DUT and the related PDN connection to this APN has been already established.

Test UICC should send PoR.

Test Environment



Test Procedure

(With APN, immediate link establishment, Bearer type 03 (Default Bearer for requested transport layer), no alpha identifier)

Step	Direction	Sequence	Expected Result
1	Network → DUT	Send “PUSH SMS” (content see below) with two commands: - “Request for BIP channel opening” as defined in TS 102 226 and TS 102 223. The SPI parameter is set to "12 21" in the sms open channel push - “Request for CAT_TP link establishment” as defined in TS 102 226 [23] and TS 102 127 [24]	ENVELOPE(SMS-PP DOWNLOAD), forwarding the PUSH SMS to the UICC
2	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 PENDING	
3	ME → UICC	FETCH	
4	UICC → ME	PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1	
5	ME → UICC	TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1	
6	UICC → DUT	PROACTIVE COMMAND: OPEN CHANNEL 12.1	- Open PDN connection - TERMINAL RESPONSE (Command performed successfully, ’91 xx’) 12.1
7	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (SYN PDU)	- Transfer data to the network through channel 1 to retrieve DUT’s port number. - TERMINAL RESPONSE (Command performed successfully, ’91 xx’) 12.1
8	Network → DUT	Transmit SYN/ACK Packet	ENVELOPE(EVENT DOWNLOAD – Data Available 12.1)
9	UICC → DUT	PROACTIVE COMMAND: RECEIVE DATA 12.1 (SYN/ACK PDU)	TERMINAL RESPONSE (Command performed successfully, ’91 xx’)

Step	Direction	Sequence	Expected Result
10	UICC → DUT	PROACTIVE COMMAND: SEND DATA 12.1 (ACK PDU)	⎩ Transfer ACK Packet into network ⎩ TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
11	UICC → DUT	PROACTIVE COMMAND: SEND SHORT MESSAGE (PoR)	⎩ Transfer PoR into network ⎩ TERMINAL RESPONSE (Command performed successfully, '91 xx') 12.1
12		If test case 12.4.3.7.2 is being executed directly, proceed to step 13. Otherwise (if this procedure is being performed as part of a different test case), the execution of this procedure is complete.	
13	UICC → DUT	PROACTIVE COMMAND: CLOSE CHANNEL 12.1	
14	DUT → UICC	TERMINAL RESPONSE : CLOSE CHANNEL 12.1	[Command performed successfully] TR Successful + 90 00

Logically

Same as PROACTIVE COMMAND: SET UP EVENT LIST 11.1.1 in clause 11.3.3.1.

Same as TERMINAL RESPONSE: SET UP EVENT LIST 11.1.1 in clause 11.3.3.1.

Same as PROACTIVE COMMAND: OPEN CHANNEL 12.1 in clause 12.4.3.7.1.

Same as TERMINAL RESPONSE: OPEN CHANNEL 12.1 in clause 12.4.3.7.1.

Same as PROACTIVE COMMAND: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: SEND DATA 12.1 in clause 12.4.3.2.1.

Same as, ENVELOPE: EVENT DOWNLOAD - Data available 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: RECEIVE DATA 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: RECEIVE DATA 12.1 in clause 12.4.3.2.1.

Same as PROACTIVE COMMAND: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

Same as TERMINAL RESPONSE: CLOSE CHANNEL 12.1 in clause 12.4.3.2.1.

13 General Device Support

13.1 General Overview

This chapter addresses requirements for general device features which cannot be grouped under previous specific section. This includes general UI requirements, modem requirements and general device related requirements.

The list of conformance requirements tested within this section is listed in the table in section 13.2.

13.2 Conformance requirements

TS26_NFC_REQ_006	The NFC controller SHALL support SWP (Single Wire Protocol) interface with the UICC as per ETSI TS 102 613.
TS26_NFC_REQ_046	Access to the UICC (logical channel) SHALL be allowed even when the mobile device is in a Radio OFF state, i.e. flight mode, airplane mode etc.
TS26_NFC_REQ_109	The OS SHALL allow the user to turn NFC on and off when the device is in Radio Off Mode.
TS26_NFC_REQ_113	Modem SHALL support APDU transmission case 1, 2 3 & 4 as defined in ISO/IEC 7816-4.
TS26_NFC_REQ_141	The modem SHALL provide a way for the application processor to retrieve the answer from the UICC after the selection of an AID.
TS26_NFC_REQ_142	The modem SHALL support 19 logical channels in addition to the basic channel.

13.3 Test Cases

13.3.1 Secure Element Access API in Radio OFF State

Test Purpose

Access to the UICC (logical channel) SHALL be allowed even when the DUT device is in a Radio OFF state, i.e. flight mode, airplane mode etc.

Referenced requirement

- TS26_NFC_REQ_046

Initial Conditions

An instance of the UICC application **APDU_TestApplication.cap** with AID01 is selectable.

MobileApplication is installed on the DUT and implements a function “Select AID01”. The application is signed and respectively named:

- **GSMA_Mobile_App_SP1_signed** signed with a test certificate #1

13.3.1.1 Test Sequence No 1: Standard

Initial Conditions

The DUT is in Radio OFF state (e.g. Flight Mode, Airplane Mode, etc.)

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch **GSMA_Mobile_App_SP1_signed**	None
2	DUT→ UICC	Call the “Select AID01” function	The expected ISO command(s) (C-APDU) sent by the DUT to the UICC: CMD 1: APDU_MANAGE_CHANNEL_OPEN (’0X 70 00 00 01’) CMD 2: APDU_SELECT_BY_DF_NAME – the CLA contains the Channel Number returned by the UICC as a response to APDU_MANAGE_CHANNEL_OPEN; Data = ‘AID01’; Le=00, or empty
3	UICC → DUT	UICC successfully opens a new logical channel to AID01	Expected result of the API called: call to “Select AID01” function returns successfully
4	DUT → UICC	Send **APDU Case 4** P1 = 0x01	The expected C-APDU: C-APDU (’XX 04 01 00 FF’ <Data field of 255 bytes> FF)
5	UICC → DUT	**APDU_TestApplication.cap** returns : P1 = 0x01 R-APDU – <data field of 255 bytes> SW1-SW2	Expected result of the API called: R-APDU - data field of 255 bytes, SW1, SW2

13.3.1.2 VOID

13.3.1.3 VOID

13.3.1.4 Test Sequence No 4: After reboot

Initial Conditions

The DUT is in Radio OFF state (e.g. Flight mode, Airplane Mode, etc.)

Step	Direction	Sequence	Expected Result
1	User → DUT	Switch off the DUT	None
2	User → DUT	Switch on the DUT	None

Step	Direction	Sequence	Expected Result
3	User → DUT	Launch **GSMA_Mobile_App_SP1_signed**	None
4	DUT→ UICC	Call the "Select AID01" function	The expected ISO command(s) (C-APDU) sent by the DUT to the UICC: CMD 1: APDU_MANAGE_CHANNEL_OPEN ('0X 70 00 00 01') CMD 2: APDU_SELECT_BY_DF_NAME – the CLA contains the Channel Number returned by the UICC as a response to APDU_MANAGE_CHANNEL_OPEN; Data = 'AID01'; Le=00, or empty
5	UICC → DUT	UICC successfully opens a new logical channel to AID01	Expected result of the API called: call to "Select AID01" function returns successfully
6	DUT → UICC	Send **APDU Case 4** P1 = 0x01	The expected C-APDU: C-APDU ('XX 04 01 00 FF' <Data field of 255 bytes> FF)
7	UICC → DUT	**APDU_TestApplication.cap** returns : P1 = 0x01 R-APDU – <data field of 255 bytes> SW1-SW2	Expected result of the API called: R-APDU - data field of 255 bytes, SW1, SW2

13.3.2 Enabled / Disabled states

Test Purpose

Verify that the device provides the current status on NFC i.e. Enabled / Disabled

Referenced requirement

- TS26_NFC_REQ_109

Initial Conditions

- ReferenceApplication.cap managing the reference transaction with AID_REF selectable into the reference UICC.
- APDU Application to send APDUs according to the reference transaction.
- Set the DUT to "Radio Off"

13.3.2.1 Test Sequence No 1: Enable, disable

Initial Conditions

NFC is disabled on the DUT

Step	Direction	Sequence	Expected Result
1	User → DUT	Enable NFC on the DUT	None
2	User → DUT	Check in the Wireless Settings option if it sets the current state of NFC to "Enabled"	“NFC enabled” indication is present
3		Perform the reference transaction using a contactless reader	Reference transaction is performed successfully
4		Try to read a NFC tag	NFC Tag is read successfully
5	User → DUT	Check if the DUT allows ensuring NFC is enabled (for example a "N" logo).	DUT indicates NFC is enabled
6	User → DUT	Disable NFC on the DUT	None
7	User → DUT	Check in the Wireless Settings option if the DUT changes the current state of NFC to "Disabled"	“NFC enabled” indication is absent
8		Perform the reference transaction using a contactless reader	Reference transaction is not performed
9		Try to read a NFC tag	NFC Tag is not read
10	User → DUT	Check if the DUT no longer indicates NFC is enabled	DUT no longer indicates NFC is enabled
11	User → DUT	Enable NFC on the DUT	None
12		Perform the reference transaction using a contactless reader	Reference transaction is performed successfully
13		Try to read a NFC tag	NFC Tag is read successfully

13.3.2.2 Test Sequence No 2: Persistence after reboot

Initial Conditions

Step	Direction	Sequence	Expected Result
1	User → DUT	Enable NFC on the DUT	None
2	User → DUT	Check in the Wireless Settings option if it sets the current state of NFC to "Enabled"	“NFC enabled” indication is present
3	User → DUT	Power off the DUT	None

Step	Direction	Sequence	Expected Result
4	User → DUT	Power on the DUT. Check in the Wireless Settings option if it sets the current state of NFC to "Enabled"	“NFC enabled” indication is still present
5	User → DUT	Launch **GSMA_Mobile_App_SP1_signed**	None
6	DUT → UICC	Call "Select AID1" function	Call is successful

13.3.3 Modem and UICC over APDU exchange

Test Purpose

To ensure the Modem support APDU exchange to access UICC for cases 1, 2, 3 & 4 as defined in ISO/IEC 7816-4.

Referenced requirement

- TS26_NFC_REQ_113

Initial Conditions

None

13.3.3.1 Test Sequence No 1

Following Test Cases in Annex B.1 6.3.1.6.5.6 (transmit(byte[] command)) from Open Mobile API test specification SHALL be passed:

- Test cases ID2 to ID16
- Test cases ID18 to ID21
- Test cases ID23

13.3.4 Modem retrieves the response data to the SELECT command

Test Purpose

To ensure the Modem provides a way for the application processor to retrieve the answer from the UICC after the selection of an AID.

Referenced requirement

- TS26_NFC_REQ_141

Initial Conditions

None

13.3.4.1 Test Sequence No 1: Modem retrieves the response data to the SELECT command

Following Test Cases in Annex B.1 6.3.1.6.5.4 (getSelectResponse) from Open Mobile API test specification SHALL be passed:

- Test cases ID1, ID2, ID4, ID5, ID6, ID7, ID8

13.3.5 Modem supports 19 logical channels

Test Purpose

To ensure the Modem support 19 logical channels in addition to the basic channel.

Referenced requirement

- TS26_NFC_REQ_142

Initial Conditions

None

13.3.5.1 Test Sequence No 1: Modem supports 19 logical channels

Following Test Cases in Annex B.1 6.3.1.6.4.8 (openLogicalChannel – Extended logical channels) from Open Mobile API test specification SHALL be passed:

- Test cases ID1, ID2, ID3

13.3.6 Long APDU handling

Test Purpose

To ensure the modem of the DUT handle correctly long APDU

There are 2 ways to handle them, either long APDU are segmented in several smaller segments, or the Modem & SIM Card both support Extended Length APDU and the APDU can be exchanged within one segment.

Referenced requirement

- TS26_NFC_REQ_113
- TS26_NFC_REQ_141

13.3.6.1 Test Sequence No 1: Get Response APDU segmented from UICC (Case2 Command)

Initial Conditions

The Applet returns a response of 2500 bytes length to the command sent, where the UICC uses SW = ’61XX’ multiple times in order to send the response.

App1: An application capable of sending a short APDU Case2 command to the Applet.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App1 on the DUT	Installation is successful
2	App → UICC	Select the Applet	Applet is successfully selected
3	App → UICC	App1 send a case2 short APDU command to the Applet	APDU command is sent
4	UICC → App	Applet answer with a 2500 bytes response	2500 bytes are received by App1 and SW: 90 00 at the end

13.3.6.2 Test Sequence No 2: Get Response APDU segmented from UICC (Case4 Command)

Initial Conditions

The Applet return a response of 2500 bytes length to the command sent, where the UICC uses SW = '61XX' multiple times in order to send the response.

App1: An application capable of sending a short APDU Case4 command to the Applet.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App1 on the DUT	Installation is successful
2	App → UICC	Select the Applet	Applet is successfully selected
3	App → UICC	App1 send a case4 short APDU command to the Applet	APDU command is sent
4	App → UICC	Applet answer with a 2500 bytes response	2500 bytes are received by App1 and SW: 90 00 at the end

13.3.7 Terminal Capability TAG 82

Test Purpose

To ensure that during the initialisation of the UICC, the DUT indicates that it supports an SWP link as specified by ETSI TS 102 221 [8]

Referenced requirement

- TS26_NFC_REQ_006

13.3.7.1 Test Sequence No 1: Terminal Capability TAG 82

Initial Conditions

Device is powered off

Step	Direction	Sequence	Expected Result
1	User→DUT	Power on the device If needed enter the PIN code of the UICC	The device is powered on.
2	User →DUT	Inspect the initialization parameters exchanged between the DUT and the UICC. Verify the content of the “TERMINAL CAPABILITY "82" TAG“ sent by the DUT to the UICC.	TERMINALCAPABILITY "82" TAG “is set to “UICC-CLF” : Supported Value of b1 is “1”. See ETSI TS 102 221 Clause 11.1.19.2.3

14 VOID

15 Android specific test cases

15.1 General overview

This chapter addresses test cases which are related to Android specific requirements.

The list of conformance requirements tested within this section is listed in the table in section 15.2.

15.2 Conformance requirements

<table>
<tr><td>TS26_NFC_REQ_063</td><td>When an NFC application is uninstalled, the device SHALL remove all information related to this application from the routing table.</td></tr>
<tr><td>TS26_NFC_REQ_063.1</td><td>When an NFC application is disabled, the device SHALL remove all information related to this application from the NFC routing table.

Note: this also applies for preinstalled applications that cannot be uninstalled but that can only be disabled.</td></tr>
<tr><td>TS26_NFC_REQ_064</td><td>When an NFC application is updated or re-enabled, the device SHALL update the routing table according to the new registration information (removing/adding elements).
Note: Static & dynamic elements from the previous version will be removed and static elements from the new version will be added.</td></tr>
<tr><td>TS26_NFC_REQ_068</td><td>The device SHALL provide a mechanism to handle AID Conflict.</td></tr>
<tr><td>TS26_NFC_REQ_068.01</td><td>AID Conflict resolution SHOULD follow the same mechanisms whether NFC services registration is dynamic or static.</td></tr>
<tr><td>TS26_NFC_REQ_068.02</td><td>When managing AID conflict resolution, the device SHALL follow the end-user preferences.</td></tr>
<tr><td>TS26_NFC_REQ_069</td><td>For UICC, Secure Element Name SHALL be SIM[smartcard slot] (e.g. SIM/SIM1, SIM2… SIMn).</td></tr>
<tr><td>TS26_NFC_REQ_093</td><td>There SHALL be APIs (as described below) to check if the NFC Controller is enabled and to ask the system to enable the NFC functionality. User input SHALL be required to enable NFC. This UI dialogue SHALL be generated by the OS and not by the calling application.
Note: Refer to the Javadoc linked to this document for more details.
<table>
<tr><th colspan="2">“com.gsma.services.utils.NfcController”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>Nested classes (NfcController.Callbacks)</td><td>All methods except “onCardEmulationMode“</td></tr>
<tr><td>NfcController</td><td>isEnabled, enableNfcController</td></tr>
</table>
Note: this requirement fulfils the generic requirements TS26_NFC_REQ_022 and TS26_NFC_REQ_023.</td></tr>
</table>

<table>
<tr><td>TS26_NFC_REQ_095</td><td>The device SHALL support routing to active CEEs.</td></tr>
<tr><td>TS26_NFC_REQ_096</td><td>Transaction event data SHALL be set in the following extended field:

<table><tr><td>com.gsma.services.nfc.extra.AID
ByteArray</td><td>Contains the card “Application Identifier” [optional]</td></tr><tr><td>com.gsma.services.nfc.extra.DATA
ByteArray</td><td>Payload conveyed by the HCI event “EVT_TRANSACTION”</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_098</td><td>The Device SHALL support “Unicast” and “Multicast” modes for receiving the “EVT_TRANSACTION”.</td></tr>
<tr><td>TS26_NFC_REQ_099</td><td>For switching from “Unicast” to “Multicast”, the device shall support an API as described below.

<table><tr><td colspan="2">“com.gsma.services.utils.Handset”</td></tr><tr><td>Classes</td><td>Methods</td></tr><tr><td>Handset</td><td>enableMultiEvt_transactionReception</td></tr></table>
This is considered a sensitive API</td></tr>
<tr><td>TS26_NFC_REQ_123</td><td>The GSMA APIs SHALL be included in the following jar file:
“com.gsma.services.nfc.jar”
Note: Library SHALL be built as a shared library in order to be used with the following tag:
<uses-library android:name="com.gsma.services.nfc” android:required="false"/></td></tr>
<tr><td>TS26_NFC_REQ_124</td><td>The device SHALL implement SIMalliance Open Mobile API, but only the
transport layer. The service layer SHALL not be implemented.
Note 1: This requirement fulfils the generic requirements TS26_NFC_REQ_047, TS26_NFC_REQ_047.1, TS26_NFC_REQ_047.2 and TS26_NFC_REQ_047.3.
Note 2: see TS26_NFC_REQ_047.3 for the values of EventTypes</td></tr>
<tr><td>TS26_NFC_REQ_125</td><td>SIMAlliance Open Mobile API and Global Platform Access Control SHALL be initialized and ready to use when the BOOT_COMPLETED intent is sent.</td></tr>
<tr><td>TS26_NFC_REQ_127</td><td>The device SHALL implement classes and methods as described below.
Note: Refer to the Javadoc linked to this document for more details.
<table><tr><td colspan="2">“com.gsma.services.nfc.NfcController”</td></tr><tr><td>Classes</td><td>Methods</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>nested classes (NfcController.Callbacks)</td><td>All methods except “onCardEmulationMode”</td></tr>
<tr><td>NfcController</td><td>All methods except “disableCardEmulationMode, enableCardEmulationMode,</td></tr>
</table>
<table>
<tr><th colspan="2">“com.gsma.services.nfc.AIDGroup”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>AIDGroup</td><td>All methods</td></tr>
</table>
<table>
<tr><th colspan="2">“com.gsma.services.nfc.OffHostService”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>OffHostService</td><td>All methods</td></tr>
</table>
Note: this requirement fulfils the generic requirements TS26_NFC_REQ_055 and TS26_NFC_REQ_058.
</td></tr>
<tr><td>TS26_NFC_REQ_127.1</td><td>APIs SHALL also manage “Off-Host” services registered statically through the Manifest</td></tr>
<tr><td>TS26_NFC_REQ_127.2</td><td>All the services/group created through these APIs SHALL stay persistent (still available after a power off/on of the device).</td></tr>
<tr><td>TS26_NFC_REQ_128</td><td>The device SHALL handle a “Long Press” on all “Tap&Pay” menu entries.</td></tr>
<tr><td>TS26_NFC_REQ_128.1</td><td>When a “Long Press” is done on a “Tap&Pay” menu entry, the device SHALL only send an intent to the application that has created this entry.
Note: the primary anticipated usage of the intent is to allow the application to display further information to the user about its services. Other usages are also possible.</td></tr>
<tr><td>TS26_NFC_REQ_129</td><td>A Transaction Event (EVT_Transaction) SHALL be triggered based on the following information:
<table>
<tr><td>Action</td><td>com.gsma.services.nfc.action.
TRANSACTION_EVENT</td></tr>
<tr><td>Mime type</td><td>-</td></tr>
<tr><td>URI</td><td>nfc://secure:0/<SEName>/<AID>
- SEName reflects the originating SE It must be compliant with SIMAlliance Open Mobile APIs
- AID reflects the originating UICC applet identifier</td></tr>
</table>
</td></tr>
<tr><td>TS26_NFC_REQ_130</td><td>The Android Framework SHALL define the following permissions for handling Open Mobile APIs and Transaction events:
- Permission-group "com.gsma.services.nfc.permission" SHALL be</td></tr>
</table>

<table>
<tr><td></td><td>defined in Android framework to host all NFC-related permissions as following: permission-group android:name = com.gsma.services.nfc.permission android:label = @string/permgrouplab_NFC = "NFC - Near Field Communication" android:icon = @drawable/perm_group_network android:description = @string/permgroupdesc_NFC = "Access various NFC features" android:priority = 270

- Permission "org.simalliance.openmobileapi.SMARTCARD" SHALL be defined in Android framework as following: android:name = org.simalliance.openmobileapi.SMARTCARD android:permissionGroup = com.gsma.services.nfc.permission android:label = @string/permlab_SmartcardService = "Access to SIM Card" android:description = @string/permdesc_SmartcardService = "Allows application to communicate with the SIM card"

- Permission "com.gsma.service.nfc.permission.TRANSACTION_EVENT" shall be defined in Android framework as following: android:name = com.gsma.service.nfc.permission.TRANSACTION_EVENT android:permissionGroup = com.gsma.services.nfc.permission android:label = @string/permlab_nfcReceiveEvent = "NFC Transaction awareness" android:description = @string/permdesc_nfcReceiveEvent = "Allows application to receive information about NFC transaction performed"</td></tr>
<tr><td>TS26_NFC_REQ_130.1</td><td>Protection level of all the permissions described in TS26_NFC_REQ_130 SHALL be set to the same level as “android.permission.NFC”.

Note:
Before Marshmallow version: android.permission.NFC is set to “dangerous”.
From Marshmallow version: android.permission.NFC is set to “normal”.</td></tr>
<tr><td>TS26_NFC_REQ_131</td><td>The device SHALL request the following permission for receiving a Transaction event:
- android.permission.NFC
- com.gsma.services.nfc.permission.TRANSACTION_EVENT</td></tr>
<tr><td>TS26_NFC_REQ_132</td><td>The device SHALL implement classes and methods as described below:

<table><tr><th colspan="2">“com.gsma.services.utils.Handset”</th></tr><tr><th>Classes</th><th>Methods</th></tr><tr><td>Handset</td><td>getProperty, getVersion</td></tr></table>
Note: this requirement fulfils the generic requirement TS26_NFC_REQ_092.</td></tr>
</table>

TS26_NFC_REQ_134	The device SHALL provide an additional menu entry in “Settings” in order to enable/disable group of AIDs (as defined by Android) belonging to the category “Other”. A group of AIDs SHALL only be enabled/disabled as a single unit.
TS26_NFC_REQ_134.1	When there is an overflow in the NFC router table, the menu entry SHOULD display: - A banner representing the groups of AIDs belonging to the category “Other” (and optionally the group description) with its current status (enabled/disabled) and a way for disabling/enabling it - A visual indication representing the NFC Controller capacity and showing 1. The space used by the selected group 2. If enablement of the selected group can fit with the remaining space of the NFC Controller routing table
TS26_NFC_REQ_134.2	The menu SHOULD be hidden to the end user until the first time an NFC Service cannot be added in the NFC Controller routing table and thereafter the menu is visible.
TS26_NFC_REQ_134.3	When the menu entry is opened, the status of NFC services group displayed by the menu entry SHALL reflect the actual status of the current NFC Controller routing table.
TS26_NFC_REQ_135	When an application is trying to register new AIDs belonging to the category “Other” and there is no automatic solution to solve any routing table overflow (as defined in REQ_143), the device SHALL - Inform the end user that some NFC Services proposed by the application cannot be used. A message SHALL provide the description of the group(s) of AIDs (android:description) which cannot be activated. - Propose the end user should disable some previously installed NFC services using the feature described in TS26_NFC_REQ_134 in order to free some NFC Controller routing table space to be able to register all AIDs needed by the current application When one AID from a group of AIDs cannot be added in the NFC Controller routing table, the entire group of AIDs SHALL not be enabled.
TS26_NFC_REQ_136	When a customer is selecting a service from the “Tap&Pay” menu there is no automatic solution to solve any routing table overflow (as defined in REQ_143), the device SHALL - Inform the end user that activation of the selected NFC services cannot be performed - Propose the end user should disable some previously installed NFC services using the feature described in TS26_NFC_REQ_134 in order to free some NFC Controller routing table space If the end user doesn’t disable enough NFC services to allow activation of the selected “Tap&Pay” menu, previous “Tap&Pay” entry SHALL stay active and the end users selection is cancelled.
TS26_NFC_REQ_143	If the default route is set to a certain card emulation environment AND the routing table of the NFC controller becomes full AND the

<table>
<tr><td></td><td>routing table would not be full with the default route set to one of the other card emulation environments then the default route SHALL be switched automatically to one of those card emulation environments.
In such situation, there SHALL be no user interaction at all.

Note: this mechanism SHALL be totally transparent for end users as this is a solution resolving the chipset routing table size shortage.</td></tr>
<tr><td>TS26_NFC_REQ_144</td><td>The Secure Element Name used for a particular Secure Element in the NFC transaction event SHALL be the same as the Secure Element Name for that Secure Element in the Secure Element Access API.</td></tr>
<tr><td>TS26_NFC_REQ_145</td><td>When OS uses certificates for signing applications, any device implementing GSMA API SHALL implement a mechanism based on certificates stored in the Active UICC Profile for protecting sensitive APIs as illustrated in the figure below.</td></tr>
<tr><td>TS26_NFC_REQ_145.3</td><td>Any sensitive API SHALL check if the application has been signed with one of the certificates stored in the Protection mechanism cache before executing the operation, and:
- Only authorised applications shall be granted access to this function.
- For any other non-authorised applications an exception needs to be raised.</td></tr>
<tr><td>TS26_NFC_REQ_146</td><td>The device SHALL implement the method as described below:
Note: Refer to the Javadoc linked to this document for more details.<table><tr><th colspan="2">“com.gsma.services.utils.Handset”</th></tr><tr><th>Classes</th><th>Methods</th></tr><tr><td>Handset</td><td>getAvailableSecureElements</td></tr></table>Note: this requirement fulfils the generic requirements TS26_NFC_REQ_059 and TS26_NFC_REQ_060.</td></tr>
<tr><td>TS26_NFC_REQ_147</td><td>In the “Tap&Pay” menu, the user selection has precedence and the behaviour of the device is consistent across different handset states.
The following scenarios SHALL be applied.

Note 1: If Android is changing the behaviour then this requirement will change accordingly.
Note 2: GSMA strongly recommend that service providers register the Off-Host AIDs in the Android OS as defined by Android.<table><tr><th>Scenario</th><th>Screen ON (Screen Lock/Unlock)</th><th>Screen OFF</th><th>Switched Off</th></tr><tr><td>Default AID route is set to HCE.
No App in the Payment category has</td><td>For any AID which is not registered in the "Other" category, contactless</td><td>For any AID which is not registered in the "Other" category, contactless</td><td>For any AID which is not registered in the "Other" category, contactless</td></tr></table></td></tr>
</table>

	been installed.	selection fails with error code ’6A82’.	selection fails with error code ’6A82’.	selection fails with error code ’6A82’.
	Default AID route is set to Off-Host No App in the Payment category has been Installed.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.
	Default AID route is set to Off-Host The user selected an Off-Host-based service in Tap&Pay menu.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.
	Default AID route is set to Off-Host The user selected a HCE-based service in Tap&Pay menu.	APDUs intended for the selected HCE service go to HCE.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.
	Default AID route is set to HCE The user selected a HCE-based service in Tap&Pay menu.	APDUs intended for the selected HCE service go to HCE.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.
	Default AID route is set to HCE The user selected an Off-Host-based service in Tap&Pay menu.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.
TS26_NFC_REQ_148	The device SHALL not change the default AID route in response to changes in device state (such as screen off, power off).			
TS26_NFC_REQ_148.1	The same behaviour SHALL be implemented when the mobile device is set in Flight Mode with NFC ON.			
TS26_NFC_REQ_150	In “Unicast” mode, “EVT_TRANSACTION” event SHALL be received by			

	only one activity.
TS26_NFC_REQ_150.1	When several activities registered for the “EVT_TRANSACTION”, the framework SHALL follow the priority scheme described below: 3. “Android:priority” level defined in the Intent Filter SHALL be compared First installed application package (APK) has a higher priority
TS26_NFC_REQ_151	Framework SHALL use “`BroadcastReceiver`” mechanism to inform the registered activities of the event.
TS26_NFC_REQ_152.1	If an application is registered to any “EVT_TRANSACTION”, by omitting the AID in the Intent, it SHALL receive the events of any applets to those accessible using the “Access Control”.
TS26_NFC_REQ_163	The device SHALL not log any APDU or AID exchanged in a communication with an applet located in an SE (UICC, eSE, …).

Note: some requirements from the Generic Device Requirements section are fulfilled for Android by specific requirements in the Android Operating System section. The table below lists generic requirements which are not tested explicitly in this section, because they are covered by the testing of the related Android requirement. (In some cases, the related Android requirement might not be tested in the current version of this document.)

Generic requirement	Related Android requirement
TS26_NFC_REQ_022	TS26_NFC_REQ_093
TS26_NFC_REQ_023	TS26_NFC_REQ_093
TS26_NFC_REQ_024	TS26_NFC_REQ_126
TS26_NFC_REQ_051	TS26_NFC_REQ_126
TS26_NFC_REQ_051.1	TS26_NFC_REQ_126
TS26_NFC_REQ_051.2	TS26_NFC_REQ_126
TS26_NFC_REQ_052	TS26_NFC_REQ_126
TS26_NFC_REQ_116	TS26_NFC_REQ_126
TS26_NFC_REQ_055	TS26_NFC_REQ_127
TS26_NFC_REQ_058	TS26_NFC_REQ_127
TS26_NFC_REQ_061	TS26_NFC_REQ_133
TS26_NFC_REQ_092	TS26_NFC_REQ_132
TS26_NFC_REQ_092.02	TS26_NFC_REQ_132
TS26_NFC_REQ_092.04	TS26_NFC_REQ_132
TS26_NFC_REQ_092.05	TS26_NFC_REQ_132

TS26_NFC_REQ_092.06	TS26_NFC_REQ_132
TS26_NFC_REQ_092.07	TS26_NFC_REQ_132
TS26_NFC_REQ_092.08	TS26_NFC_REQ_132
TS26_NFC_REQ_092.09	TS26_NFC_REQ_132
TS26_NFC_REQ_092.10	TS26_NFC_REQ_132
TS26_NFC_REQ_092.11	TS26_NFC_REQ_132

15.3 NFC Features

15.3.1 General overview

This section provides test cases for checking Android specific core NFC features like:
Availability of the GSMA APIs in the device
APIs used to handle the NFC Controller

The list of conformance requirements tested within this section is listed in the table in section 15.3.2.

15.3.2 Conformance requirements

<table>
<tr><td>TS26_NFC_REQ_093</td><td>There SHALL be APIs (as described below) to check if the NFC Controller is enabled and to ask the system to enable the NFC functionality. User input SHALL be required to enable NFC. This UI dialogue SHALL be generated by the OS and not by the calling application.
Note: Refer to the Javadoc linked to this document for more details.

<table>
<tr><th colspan="2">“com.gsma.services.utils.NfcController”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>Nested classes (NfcController.Callbacks)</td><td>All methods except “onCardEmulationMode“</td></tr>
<tr><td>NfcController</td><td>isEnabled, enableNfcController</td></tr>
</table>
Note: this requirement fulfils the generic requirements TS26_NFC_REQ_022 and TS26_NFC_REQ_023.</td></tr>
<tr><td>TS26_NFC_REQ_123</td><td>The GSMA APIs SHALL be included in the following jar file:
“com.gsma.services.nfc.jar”
Note: Library SHALL be built as a shared library in order to be used with the following tag:
<uses-library android:name="com.gsma.services.nfc”
android:required="false"/></td></tr>
</table>

15.3.3 Test Cases

15.3.3.1 Shared library

Test Purpose

Ensure DUT contains all GSMA APIs as described in the GSMA NFC Handset Requirements and its Javadoc.

Referenced requirement

- TS26_NFC_REQ_123

15.3.3.1.1 Test Sequence No 1

When checking the presence/absence of modifiers for classes, constructors, methods and fields, the presence/absence of the following modifiers shall be checked:

- public
- protected
- private
- static
- abstract

In the current version of this document, the presence/absence of the following modifier shall not be checked:

- final

NOTE: future versions of this document may change the requirement regarding final to indicate that the modifier should be checked. In particular, this might occur if TS.26 [1] is updated to indicate explicitly that classes should be final.

The presence/absence of the following modifiers shall not be checked:

- strictfp
- volatile
- transient
- synchronized
- native

In the context of this test case, the term "accessible" means public or protected

Initial Conditions

None

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	App →DUT	Using reflection ("Class.forName"), check if all the requested GSMA classes/interfaces are available in the DUT. List of GSMA classes/interfaces: • com.gsma.services.utils.Handset • com.gsma.services.nfc.NfcController • com.gsma.services.nfc.NfcController $Callbacks • com.gsma.services.nfc.OffHostServic e • com.gsma.services.nfc.AidGroup • com.gsma.services.utils. • InsufficientResourcesException • com.gsma.services.nfc.SEController • com.gsma.services.nfc.SEController$ Callbacks	A valid Class object shall be returned for every call
2	App →DUT	Using reflection, check if com.gsma.services.utils.Handset is a class that, implements the following methods and that their definition is fully compliant to GSMA requirements. List of methods: • enableMultiEvt_transactionReception • getAvailableSecureElements (only to be checked if DUT supports O_ANDROID_API_V8_OR_LATER) • getProperty • getVersion	Super-class and modifiers of the class are compliant. There is one accessible constructor with no parameter. Modifiers of the constructor are compliant. All methods are implemented. For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared
3	App →DUT	Using reflection, check if com.gsma.services.nfc.NfcController is a class, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • defineOffHostService • deleteOffHostService • disableCardEmulationMode • enableCardEmulationMode • enableNfcController • getDefaultController • getDefaultOffHostService • getOffHostServices • isCardEmulationEnabled • isEnabled	Super-class and modifiers of the class are compliant. Any constructor is not accessible All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared

Step	Direction	Sequence	Expected Result
4	App →DUT	Using reflection, check if com.gsma.services.nfc.NfcController$Callbacks is an interface, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • onCardEmulationMode • onEnableNfcController • onGetDefaultController	Super-interface and modifiers of the interface are compliant. All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared
5	App →DUT	Using reflection, check if com.gsma.services.nfc.OffHostService is a class, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • commit • defineAidGroup • deleteAidGroup • getAidGroups • getBanner • getDescription • getLocation • setBanner(int) (only to be checked if DUT supports O_ANDROID_API_V8_OR_LATER) • setBanner(Drawable)	Super-class and modifiers of the class are compliant. Any constructor is not accessible All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared
6	App →DUT	Using reflection, check if com.gsma.services.nfc.AidGroup is a class, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • addNewAid • getCategory • getDescription • removeAid	Super-class and modifiers of the class are compliant. Any constructor is not accessible All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared

Step	Direction	Sequence	Expected Result
7	App →DUT	Using reflection, check if com.gsma.services.nfc.SEController is a class, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • getActiveSecureElement • getDefaultController • setActiveSecureElement	Super-class and modifiers of the class are compliant. Any constructor is not accessible All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared
8	App →DUT	Using reflection, check if com.gsma.services.nfc.SEController$Callbacks is an interface, implements the following methods and their definition is fully compliant to GSMA requirements. List of methods: • onGetDefaultController	Super-interface and modifiers of the interface are compliant. All methods are implemented For each of them, Modifiers are compliant Return type is compliant Number of parameters and associated types are compliant Requested checked exception has been declared
9	App →DUT	Using reflection, check if com.gsma.services.utils.Handset defines the following constants and their type/value is fully compliant to GSMA requirements. List of constants: • BATTERY_LOW_MODE • BATTERY_POWER_OFF_MODE • BATTERY_OPERATIONAL_MODE (only to be checked if DUT supports O_ANDROID_API_V8_OR_LATER) • FELICA • HCI_SWP • MIFARE_CLASSIC • MIFARE_DESFIRE • MULTIPLE_ACTIVE_CEE • NFC_FORUM_TYPE3 • OMAPI	All constants are defined For each of them, Modifiers are compliant Type is compliant Associated value is equal to the value defined by GSMA

Step	Direction	Sequence	Expected Result
10	App →DUT	Using reflection, check if com.gsma.services.nfc.NfcController$Callbacks defines the following constants and their type/value is fully compliant to GSMA requirements. List of constants: CARD_EMULATION_DISABLED CARD_EMULATION_ENABLED CARD_EMULATION_ERROR	All constants are defined For each of them, Modifiers are compliant Type is compliant Associated value is equal to the value defined by GSMA

15.3.3.2 Getting an instance of the "NFController" class

Test Purpose

Ensure DUT can provide asynchronously an instance of the "NFCController" class as defined in the javadoc linked to the GSMA NFC Requirements.

Referenced requirement

- TS26_NFC_REQ_093
- TS26_NFC_REQ_123

15.3.3.2.1 Test Sequence No 1: getDefaultController, valid usage

Initial Conditions

Application SHALL define the following variables

- [var01] refers to the "Context" of the Android application
- [var02] contains an instance of the "NfcController$Callbacks" class and is not null

Step	Direction	Sequence	Expected Result
1		Call "getDefaultController" static method with the following parameters: • context: [var01] • cb: [var02]	• "onGetDefaultController" method, member of the instance referred by [var02] is called • "onGetDefaultController" parameter is not *null*
2		Call "isEnabled" method from the parameter returned by the "onGetDefaultController" method	No exception thrown by the system

15.3.3.2.2 Test Sequence No 2: getDefaultController, null callback

Initial Conditions

Application SHALL define the following variable

- [var01] refers to the "Context" of the Android application

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1		Call “getDefaultController” static method with the following parameters: • context: [var01] • cb: *null*	3 options: • No exception thrown by the system • An “IllegalArgumentException” is thrown by the system • An “NullPointerException” is thrown by the system

15.3.3.3 Getting the status the NFC Controller

Test Purpose

Ensure DUT can provide the status of the NFC Controller from APIs as described in the GSMA NFC Handset Requirements and its Javadoc.

Referenced requirement

- TS26_NFC_REQ_093

15.3.3.3.1 Test Sequence No 1: isEnabled, NFC enabled

Initial Conditions

- NFC is activated on the DUT
- An instance of the “NfcController” class has been retrieved successfully and is not null

Step	Direction	Sequence	Expected Result
1		From the “NfcController” instance, call the “isEnabled” method	Method SHALL return *true*

15.3.3.3.2 Test Sequence No 2: isEnabled, NFC disabled

Initial Conditions

- NFC is deactivated on the DUT
- An instance of the “NfcController” class has been retrieved successfully and is not null

Step	Direction	Sequence	Expected Result
1		From the “NfcController” instance, call the “isEnabled” method	Method SHALL return *false*

15.3.3.4 Enabling the NFC Controller

Test Purpose

Ensure DUT can enable the NFC Controller from APIs as described in the GSMA NFC Handset Requirements and its Javadoc.

Referenced requirement

- TS26_NFC_REQ_093

15.3.3.4.1 Test Sequence No 1: enableNfcController, confirmation dialog cancelled

Initial Conditions

- NFC is deactivated on the DUT
- An instance of the "NfcController" class has been retrieved successfully and is not null

Step	Direction	Sequence	Expected Result
1		From the "NfcController" instance, call the "enableNfcController" method	A dialog box asking confirmation to the user is displayed. This dialog box SHALL provide an option to cancel or confirm the action
2		Cancel the Action	• Dialog box SHALL be withdrawn • An icon representing enablement of NFC SHALL not be displayed in the status bar
3		From the "NfcController" instance, call the "isEnabled" method	Method SHALL return *false*
4		Check that NFC is indicated as disabled in the settings	NFC Status SHALL be "disabled"

15.3.3.4.2 Test Sequence No 2: enableNfcController, confirmation dialog confirmed

Initial Conditions

- NFC is deactivated on the DUT
- An instance of the "NfcController" class has been retrieved successfully and is not null

Step	Direction	Sequence	Expected Result
1		From the "NfcController" instance, call the "enableNfcController" method	A dialog box asking confirmation to the user is displayed. This dialog box SHALL provide an option to cancel or confirm the action
2		Select to confirm the Action	•Dialog box SHALL be withdrawn •If the DUT has an icon representing the NFC enablement, the DUT SHALL display this icon on the status bar.
3		From the "NfcController" instance, call the "isEnabled" method	Method SHALL return *true*
4		In the "Setting" menu, check NFC status.	NFC status SHALL be "enabled"

15.3.3.4.3 Test Sequence No 3: enableNfcController, NFC already enabled

Initial Conditions

NFC is activated on the DUT

- An instance of the “NfcController” class has been retrieved successfully and is not null

Step	Direction	Sequence	Expected Result
1		From the “NfcController” instance, call the “enableNfcController” method	No dialog box appears. OR a) a dialog box appears asking confirmation to the user. This dialog box SHALL provide an option to cancel or confirm the action. b) “Confirm” is pressed c) the dialog box shall disappear
2		From the “NfcController” instance call the “isEnabled” method	Method SHALL return *true*
3		In the “Setting” menu check NFC status	NFC status SHALL be “enabled”
4		From the “NfcController” instance call the “enableNfcController” method	No dialog box appears. OR a) a dialog box appears asking confirmation to the user. This dialog box SHALL provide an option to cancel or confirm the action. b) “Cancel” is pressed c) the dialog box shall disappear
5		From the “NfcController” instance, call the “isEnabled” method	Method SHALL return true
6		In the “Setting” menu, check NFC status	NFC status SHALL be “enabled”

15.4 Accessing the Secure Elements

15.4.1 General overview

This section provides test cases related to the Secure Element access.

15.4.2 Conformance requirements

TS26_NFC_REQ_69	For UICC, Secure Element Name SHALL be SIM[smartcard slot] (e.g. SIM/SIM1, SIM2… SIMn).
TS26_NFC_REQ_124	The device SHALL support SIMalliance Open Mobile API, but only the transport layer. Note: this requirement fulfils the generic requirements TS26_NFC_REQ_047, TS26_NFC_REQ_047.1, TS26_NFC_REQ_047.2 and TS26_NFC_REQ_047.3.

TS26_NFC_REQ_125	SIMalliance Open Mobile API and Global Platform Access Control SHALL be initialized and ready to use when the BOOT_COMPLETED intent is sent.
TS26_NFC_REQ_144	The Secure Element Name used for a particular Secure Element in the NFC transaction event SHALL be the same as the Secure Element Name for that Secure Element in the Secure Element Access API.
TS26_NFC_REQ_146	The device SHALL implement the method as described below: Note: Refer to the Javadoc linked to this document for more details. "com.gsma.services.utils.Handset" **Classes** / **Methods** Handset / getAvailableSecureElements Note: this requirement fulfils the generic requirements TS26_NFC_REQ_059 and TS26_NFC_REQ_060.

15.4.3 Test Cases

15.4.3.1 Open Mobile Service Layer API

Test Purpose
To ensure that OMAPI service layer API are not available and accessible from the android application.

Referenced requirement
- TS26_NFC_REQ_124

Initial Conditions
- The DUT is powered on

15.4.3.1.1 Test Sequence No 1

Initial Conditions

None

Step	Direction	Sequence	Expected Result
1	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer classes are available in the DUT or not. List of OMAPI Service Layer classes: - org.simalliance.openmobileapi.Provider	Exception "ClassNotFoundException" is thrown

Step	Direction	Sequence	Expected Result
2	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer (Discovery API) classes are available in the DUT or not. List of OMAPI Service Layer classes: • org.simalliance.openmobileapi.SEDiscovery • org.simalliance.openmobileapi.SERecognizer • org.simalliance.openmobileapi.SERecognizerByAID • org.simalliance.openmobileapi.SERecognizerByATR • org.simalliance.openmobileapi.SERecognizerByHistoricalBytes	Exception "ClassNotFoundException" for each class is thrown
3	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer (File Management API) classes are available in the DUT or not. List of OMAPI Service Layer classes: • org.simalliance.openmobileapi.FileViewProvider • org.simalliance.openmobileapi.FileViewProvider.FCP • org.simalliance.openmobileapi.FileViewProvider.Record	Exception "ClassNotFoundException" for each class is thrown
4	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer (Authentication Service API) classes are available in the DUT or not. List of OMAPI Service Layer classes: • org.simalliance.openmobileapi.AuthenticationProvider • org.simalliance.openmobileapi.AuthenticationProvider.PinID	Exception "ClassNotFoundException" for each class is thrown

Step	Direction	Sequence	Expected Result
5	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer (PKCS# 15 Service API) classes are available in the DUT or not. List of OMAPI Service Layer classes: • org.simalliance.openmobileapi.PKCS15Provider • org.simalliance.openmobileapi.PKCS15Provider.Path	Exception "ClassNotFoundException" for each class is thrown
6	App → DUT	Using reflection ("Class.forName"), check if any of the requested OMAPI service layer (Secure Storage API) classes are available in the DUT or not. List of OMAPI Service Layer classes: • org.simalliance.openmobileapi.SecureStorageProvider	Exception "ClassNotFoundException" for each class is thrown

15.4.3.2 Access to SIMAlliance OMAPI after the device is booted

Test Purpose

To ensure that an application has access to the SE through the OMAPI right after the BOOT_COMPLETED event is received

Referenced requirement

- TS26_NFC_REQ_125

15.4.3.2.1 Test Sequence No 1: OM API access after boot, ARA

Initial Conditions

- An instance of the UICC application **APDU_TestApplication.cap** with AID 01 is selectable and is installed on to the UICC
- **GSMA_Mobile_App_BOOT#1** application signed with a private key corresponding to test certificate #1 and implementing a function "Select AID 01" using the openLogicalChannel() method for the UICC application AID 01
- **GSMA_Mobile_App_BOOT#1** defines a broadcastReceiver" as follows
- Registers in its Manifest the following permissions:

```
<uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
```

- Define a "BroadcastReceiver" as follows

```
<receiver android:name=".BootUpReceiver">
 <intent-filter>
  <action android:name=
   "android.intent.action.BOOT_COMPLETED"></action>
```

```
 </intent-filter>
</receiver>
```

- When the activity **GSMA_Mobile_App_BOOT#1** receive the intent "BOOT_COMPLETED" the activity will send "select AID 01" and "select AID 02" to the UICC immediately
- **GSMA_Mobile_App_BOOT#1** is installed on the DUT
- Access Control is authorizing [**GSMA_Mobile_App_BOOT#1**] to access the applet "**APDU_TestApplication.cap**" on the UICC using AID 01 and preventing access to the applet using AID 02 ..
- The Access Control is using ARA mechanism.

The DUT is powered off.

Step	Direction	Sequence	Expected Result
1	User → DUT	Power on the DUT	Activity listening "BOOT_COMPLETED" is launched.
2	App → UICC	Call "Select AID 01" function	SELECT command is successful and call to "Select AID 01" function returns successfully
3	App → UICC	Call "Select AID 02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted

15.4.3.2.2 Test Sequence No 2: OM API access after boot, ARF

Initial Conditions

- An instance of the UICC application **APDU_TestApplication.cap** with AID 01 is selectable and is installed on to the UICC

  GSMA_Mobile_App_BOOT#1 application signed with a private key corresponding to test certificate #1 and implementing a function "Select AID 01" using the openLogicalChannel() method for the UICC application AID 01
- **GSMA_Mobile_App_BOOT#1** defines a broadcastReceiver as follows
- Registers in its Manifest the following permissions:

```
<uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
```

- Define a "BroadcastReceiver" as follows

```
<receiver android:name=".BootUpReceiver">
 <intent-filter>
  <action android:name=
   "android.intent.action.BOOT_COMPLETED"></action>
 </intent-filter>
</receiver>
```

- When the activity **GSMA_Mobile_App_BOOT#1** receive the intent "BOOT_COMPLETED" the activity will send "select AID 01" and "select AID 02" to the UICC immediately.

- **GSMA_Mobile_App_BOOT#1** is installed on the DUT
- Access Control is authorizing [**GSMA_Mobile_App_BOOT#1**] to access the applet "**APDU_TestApplication.cap**" on the UICC using AID 01 and preventing access to the applet using AID 02.
- The Access Control is using ARF mechanism.

- The DUT is powered off

Step	Direction	Sequence	Expected Result
1	User → DUT	Power on the DUT	Activity listening "BOOT_COMPLETED" is launched.
2	APP→ UICC	Call "Select AID 01" function	SELECT command is successful and call to "Select AID 01" function returns successfully
3	APP → UICC	Call "Select AID 02" function	Call is unsuccessful, returning an error indicating that the access control rights are not granted.

15.4.3.3 Getting the list of available Secure Elements

To ensure that the framework is implementing the method for getting the list of available Secure Elements as defined by TS26_NFC_REQ_146.

Referenced requirement

- TS26_NFC_REQ_146

15.4.3.3.1 Test Sequence No 1: Handset::getavailableSecureElements

Initial Conditions

- An instance of the "Handset" class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	APP → DUT	From the "Handset" instance, call the "getAvailableSecureElements" method with a value which is different from the following constants: - "BATTERY_OPERATIONAL _MODE" - "BATTERY_ POWER_OFF _MODE" - "BATTERY_ LOW_MODE"	An "IllegalArgumentException" exception is thrown by the system.
2	APP→ DUT	From the "Handset" instance, call the "getAvailableSecureElements " method with the value "BATTERY_OPERATIONAL_MODE" constant as parameter	- No exception thrown by the system - Return a list in which one entry identifies the UICC

Step	Direction	Sequence	Expected Result
3	APP → DUT	From the “Handset” instance, call the “getAvailableSecureElements“ method with the value “BATTERY_POWER_OFF_MODE” constant as parameter Result is stored in [List01]	) No exception thrown by the system) [List01] is not *null*
4	APP → DUT	From the “Handset” instance, call the “getAvailableSecureElements“ method with the value “BATTERY_LOW_MODE” constant as parameter Result is stored in [List02]	) No exception thrown by the system) [List02] is not *null*) At least one of [List01] and [List02] contains an entry identifying the UICC

15.4.3.4 Identical SE Names across APIs

To ensure that the framework is using the same Secure Element names across all APIs.

Referenced requirement

-) TS26_NFC_REQ_69
-) TS26_NFC_REQ_144

15.4.3.4.1 Test Sequence No 1: Usage of identical SE Names across device components

Initial Conditions

-) Application [app01]
-) Provides the following features
  -) Retrieves the list of Secure Elements available when the DUT is in “Operation mode”
  -) Dynamically creates an “Off-Host” service/group for registering AID(s) in the routing table of the NFC Controller
  -) Retrieves the list of readers using SIMAlliance APIs
  -) Displays a notification when a transaction event is received
  -) The notification displays the Secure Element name at the origin of the event
-) Applet with [AID01] as AID is installed on the UICC
-) Access Control is allowing communication between any applets in the UICC and [app01]

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	APP → DUT	Retrieve the list of Secure Element(s) when the device is in “Operational Mode” using the getAvailableSecureElements() method Entry identifying the UICC is stored in [SEName]	• No exception thrown by the system • A list containing at least the UICC is returned • Entry identifying the UICC contains a string equal to “SIM” or “SIM1”
2	APP→ DUT	Create an “Off-Host” service using the following details: • “myOffHostService” as description • [SEName] as Secure Element name Instance of the new service is stored in [myService]	No exception thrown by the system
3	APP → DUT	Create a group as part of [myService] using the following details: • “myGroup01” as description • android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant as category • A banner where it is displayed “myOffHostService” Instance of the new service is stored in [myGroup]	No exception thrown by the system
4	APP → DUT	Register [AID01] in [myGroup] group	No exception thrown by the system
5	APP → DUT	Commit the creation of the service, the group and the registration of [AID01]	No exception thrown by the system
6	APP → DUT	Using SIMAlliance APIs, get the list of available readers	The name of one of the returned reader is equal to the string stored in [SEName]
7	User → DUT	From the “Setting” menu open the “Tap&Pay” entry	List of entries contains a banner where “myOffHostService” is displayed
8	User → DUT	Select entry with “myOffHostService” banner	
9	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
10	User → PCD	Power on the field	
11	PCD → DUT DUT → UICC	Send “SELECT APDU” command with [AID01] as parameter	SW = 90 00 is returned
12	UICC → DUT DUT → APP	Send a transaction event from an applet in the UICC	• A notification linked to the transaction event is displayed by [app01] • The Secure Element is displayed by the notification is equal to the one stored in [SEName]

15.5 NFC Transaction Events

15.5.1 General overview

This section provides test cases for checking reception of NFC Transaction events.

The list of conformance requirements tested within this section is listed in the table in section 15.5.2.

15.5.2 Conformance requirements

<table>
<tr><td>TS26_NFC_REQ_096</td><td>Transaction event data SHALL be set in the following extended field:

<table><tr><td>com.gsma.services.nfc.extra.AID
ByteArray</td><td>Contains the card “Application Identifier” [optional]</td></tr><tr><td>com.gsma.services.nfc.extra.DATA
ByteArray</td><td>Payload conveyed by the HCI event “EVT_TRANSACTION”</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_098</td><td>The Device SHALL support “Unicast” and “Multicast” modes for receiving the “EVT_TRANSACTION”.</td></tr>
<tr><td>TS26_NFC_REQ_099</td><td>For switching from “Unicast” to “Multicast”, the device SHALL support an API as described below.

<table><tr><td colspan="2">“com.gsma.services.utils.Handset”</td></tr><tr><td>Classes</td><td>Methods</td></tr><tr><td>Handset</td><td>enableMultiEvt_transactionReception</td></tr></table>
This is considered a sensitive API</td></tr>
<tr><td>TS26_NFC_REQ_129</td><td>A Transaction Event (EVT_Transaction) SHALL be triggered based on the following information:
<table><tr><td>Action</td><td>com.gsma.services.nfc.action.
TRANSACTION_EVENT</td></tr><tr><td>Mime type</td><td>-</td></tr><tr><td>URI</td><td>nfc://secure:0/<SEName>/<AID>
- SEName reflects the originating SE It must be compliant with SIMAlliance Open Mobile APIs
- AID reflects the originating UICC applet identifier</td></tr></table></td></tr>
<tr><td>TS26_NFC_REQ_130</td><td>The Android Framework SHALL define the following permissions for handling Open Mobile APIs and Transaction events:
- Permission-group "com.gsma.services.nfc.permission" SHALL be defined in Android framework to host all NFC-related permissions as following: permission-group android:name =</td></tr>
</table>

	com.gsma.services.permission android:label = @string/permgrouplab_NFC = "NFC - Near Field Communication" android:icon = @drawable/perm_group_network android:description = @string/permgroupdesc_NFC = "Access various NFC features" android:priority = 270 - Permission "org.simalliance.openmobileapi.SMARTCARD" SHALL be defined in Android framework as following: android:name = org.simalliance.openmobileapi.SMARTCARD android:permissionGroup = com.gsma.services.nfc.permission android:label = @string/permlab_SmartcardService = "Access to SIM Card" android:description = @string/permdesc_SmartcardService = "Allows application to communicate with the SIM card" - Permission "com.gsma.service.nfc.permission.TRANSACTION_EVENT" shall be defined in Android framework as following: android:name = com.gsma.service.nfc.permission.TRANSACTION_EVENT android:permissionGroup = com.gsma.services.nfc.permission android:label = @string/permlab_nfcReceiveEvent = "NFC Transaction awareness" android:description = @string/permdesc_nfcReceiveEvent = "Allows application to receive information about NFC transaction performed"
TS26_NFC_REQ_145	When OS uses certificates for signing applications, any device implementing GSMA API SHALL implement a mechanism based on certificates stored in the Active UICC Profile for protecting sensitive APIs as illustrated in the figure below.
TS26_NFC_REQ_145.3	Any sensitive API SHALL check if the application has been signed with one of the certificates stored in the Protection mechanism cache before executing the operation, and: - Only authorised applications shall be granted access to this function. For any other non-authorised applications an exception needs to be raised.
TS26_NFC_REQ_150	In “Unicast” mode, “EVT_TRANSACTION” event SHALL be received by only one activity.
TS26_NFC_REQ_150.1	When several activities registered for the “EVT_TRANSACTION”, the framework SHALL follow the priority scheme described below: 1. “Android:priority” level defined in the Intent Filter SHALL be compared First installed application package (APK) has a higher priority
TS26_NFC_REQ_151	Framework SHALL use “`BroadcastReceiver`” mechanism to inform the registered activities of the event.
TS26_NFC_REQ_152.1	If an application is registered to any “EVT_TRANSACTION”, by omitting the AID in the Intent, it SHALL receive the events of any applets to those accessible using the “Access Control”.

15.5.3 Test Cases

15.5.3.1 Switching to “Multicast” mode

Test Purpose

Ensure DUT implements correctly defined API for switching to “Multicast” mode and broadcast accordingly “EVT_Transaction” to several applications.

Referenced requirement

- TS26_NFC_REQ_098
- TS26_NFC_REQ_099
- TS26_NFC_REQ_145
- TS26_NFC_REQ_145.3

15.5.3.1.1 Test Sequence No 1: enableMultiEvt_transactionReception, not authorised

Initial Conditions

- PKCS#15 structure on the UICC:
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Application [app01] is signed with a certificate which is not [cert01]
  - An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App→DUT	From the “Handset” instance, call “enableMultiEvt_transactionReception” method	**“**SecurityException” is thrown by the system

15.5.3.1.2 Test Sequence No 2: enableMultiEvt_transactionReception, enable, reboot

Initial Conditions

- PKCS#15 structure on the UICC:
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Access Control is allowing communication between any applets in the UICC and [app01], [app02] and [app03]

- Application [app01]
  - Defines an “activity” which listens an “intent-filter” as follows

```
<intent-filter>
    <action android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT" />
    <category android:name="android.intent.category.DEFAULT" />
    <data
           android:host="secure"
           android:pathPrefix="/SIM"
           android:port="0"
           android:scheme="nfc"/>
</intent-filter>
```

- Applications [app02] and [app03]
  - Signed with certificate [cert01]
  - Define a “BroadcastReceiver” which an “intent-filter” as follows

```
<intent-filter>
    <action android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT" />
    <category android:name="android.intent.category.DEFAULT" />
    <data
           android:host="secure"
           android:pathPrefix="/SIM"
           android:port="0"
           android:scheme="nfc"/>

</intent-filter>
```

- An instance of the “Handset” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App→DUT	From the “Handset” instance, call “enableMultiEvt_transactionReception ” method from [app02]	No exception thrown by the system
2	UICC→DUT	Send a transaction event from an applet in the UICC	• [app02] and [app03] are receiving the event • [app01] is not receiving the event
3	App→DUT	Restart DUT	
4	UICC →DUT	Send transaction event from an applet in the UICC	• [app01] is receiving the event • [app02] and [app03] are not receiving the event

15.5.3.2 Receiving EVT_Transaction from “BroadcastReceiver”

Test Purpose

Ensure DUT implements correctly the filtering feature of “BroadcastReceiver” in order to receive appropriate EVT_Transaction events

Referenced requirement

- TS26_NFC_REQ_098
- TS26_NFC_REQ_099
- TS26_NFC_REQ_151

15.5.3.2.1 Test Sequence No 1: enableMultiEvt_transactionReception, path pattern

Initial Conditions

- PKCS#15 structure on the UICC:
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Access Control is allowing communication from any applets in the UICC and [app01]
- Application [app01]
  - Signed with certificate [cert01]
  - An instance of the “Handset” class has been retrieved successfully and is not *null*
  - In all the following sequences, “intent-filter” must be defined with
    - action: "com.gsma.services.nfc.action.TRANSACTION_EVENT"
    - category: "android.intent.category.DEFAULT"

Step	Direction	Sequence	Expected Result
1	App→DUT	From the “Handset” instance, call “enableMultiEvt_transactionReception ” method	No exception thrown by the system
2	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPattern="/.*"	
3	App →DUT	Send a transaction event from an applet in the UICC	Application is receiving the event
4	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPattern="/SIM.*/.*"	
5	App →DUT	Send a transaction eventfrom an applet in the UICC	Application is receiving the event

Step	Direction	Sequence	Expected Result
6	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPattern="/X/.*"	
7	App →DUT	Send a transaction event from an applet in the UICC	Application is not receiving the event
8	App→DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPattern="/SIM.*/X.*"	
9	UICC →DUT	Send transaction event from an applet in the UICC	Application is not receiving the event

15.5.3.2.2 Test Sequence No 2: enableMultiEvt_transactionReception, path prefix

Initial Conditions

- PKCS#15 structure on the UICC
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Access Control is allowing communication between any applets in the UICC and [app01]
- SEName for the UICC is mentioned in the following sequences as [SEName]
- Application [app01]
  - Signed with certificate [cert01]
  - An instance of the “Handset” class has been retrieved successfully and is not *null*
  - In all the following sequences, “intent-filter” must be defined with
    - action: "com.gsma.services.nfc.action.TRANSACTION_EVENT"
    - category: "android.intent.category.DEFAULT"

Step	Direction	Sequence	Expected Result
1	App →DUT	From the “Handset” instance call “enableMultiEvt_transactionReception ” method	No exception thrown by the system

Step	Direction	Sequence	Expected Result
2	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPrefix="/"	
3	UICC →DUT	Send transaction event from an applet in the UICC	Application is receiving the event
4	App→DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPrefix="/SIM"	
5	UICC →DUT	Send a transaction event from an applet in the UICC	Application is receiving the event
6	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPrefix="/X"	
7	UICC →DUT	Send transaction event from an applet in the UICC	Application is not receiving the event
8	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="0" - pathPrefix="/[SEName]/X" Note: SEName as to be replaced by the UICC SE Name.	
9	UICC →DUT	Send transaction event from an applet in the UICC	Application is not receiving the event

15.5.3.2.3 Test Sequence No 3: enableMultiEvt_transactionReception, invalid intent parameters

Initial Conditions

- PKCS#15 structure on the UICC
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Access Control is allowing communication between any applets in the UICC and [app01]
- Application [app01]
  - Signed with certificate [cert01]
  - An instance of the “Handset” class has been retrieved successfully and is not *null*
  - In all the following sequences, “intent-filter” must be defined with
    - action: "com.gsma.services.nfc.action.TRANSACTION_EVENT"
    - category: "android.intent.category.DEFAULT"

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance, call “enableMultiEvt_transactionReception ” method	No exception thrown by the system
2	App → DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="tcp" - host="secure" - port="0" - pathPrefix="/SIM"	
3	UICC → DUT	Send transaction event from an applet in the UICC	Application is not receiving the event
4	App → DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="unsecure" - port="0" - pathPrefix="/SIM"	
5	UICC → DUT	Send transaction event from an applet in the UICC	Application is not receiving the event

Step	Direction	Sequence	Expected Result
6	App →DUT	Application defines an “intent-filter” with following extra parameters and dynamically registers a “BroadcastReceiver” with it - scheme="nfc" - host="secure" - port="1" - pathPrefix="/SIM"	
7	UICC →DUT	Send transaction event from an applet in the UICC	Application is not receiving the event

15.5.3.3 Checking EVT_Transaction data sent through “BroadcastReceiver”

Test Purpose

Ensure DUT transmits correctly all the requested data through the “BroadcastReceiver”

Referenced requirement

- TS26_NFC_REQ_098
- TS26_NFC_REQ_099

15.5.3.3.1 Test Sequence No 1

Initial Conditions

- PKCS#15 structure on the UICC
  - A certificate [cert01] is stored in a file [EF01]
  - A EF_CDF file [EF02] as defined by PKCS#15 specification is referencing [EF01]
  - EF_ODF file contains a reference to [EF02] for the “A5” type
- Access Control is allowing communication between any applets in the UICC and [app01]
- Application [app01]
  - Signed with certificate [cert01]
  - Define a “BroadcastReceiver” which listens an “intent-filter” as follows

```
<intent-filter>
    <action android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT" />
    <category android:name="android.intent.category.DEFAULT" />
    <data
          android:host="secure"
          android:pathPrefix="/SIM"
          android:port="0"
          android:scheme="nfc"/>

</intent-filter>
```

  - An instance of the “Handset” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance, call “enableMultiEvt_transactionReception ” method	No exception thrown by the system
2	UICC → DUT	Send transaction event from an applet in the UICC	Application is receiving the event
3	App → DUT	From received event, following data is extracted: - SEName is stored in [var01] - AID is stored in [var02] - If “com.gsma.services.nfc.extra.AID” field is available it is stored in [var03]	No exception thrown by the system If [var03] is available, check, if [var02] equals [var03]
4	App → DUT	Using OMAPI APIs, open a Session using [var01] as SEName	Following SEName stored in [var01], an instance of the “Session” class is returned
5	App → DUT	Using OMAPI APIs and the instance of the “Session” class previously returned, open a logical channel to the applet which AID is stored in [var02]	A non null object representing an instance of the “Channel” class is returned

15.5.3.4 Test EVT Transaction event shall be handled only by the appropriate applications

Test Purpose

Test EVT Transaction event shall have a specific format

Referenced requirement

- TS26_NFC_REQ_129
- TS26_NFC_REQ_152.1

Initial Conditions

- GSMA Mobile App UIA #2 and #5 is just a variant of GSMA Mobile App UIA #1 as described in section in 8.3.4

15.5.3.4.1 Test Sequence No 1: Unicast

Initial Conditions

- DUT is running in “unicast” mode (default mode after device power cycle)
- Applets with [AID01] and [AID02] as AID are installed on the UICC
- Access Control is
  - Allowing Communication between applet [AID01] and [app01], [app03]
  - Blocking any communication with applet [AID02]
- Following applications are installed in the following order: [app02], [app03], [app01]

- Application [app01]
  - Signed with certificate [cert01]
  - Define an “Activity” which listens an “intent-filter” as follows

```
<intent-filter>
	<action
	android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
	<category android:name="android.intent.category.DEFAULT"/>
	<data
		android:host="secure"
		android:pathPattern="/SIM.*/[AID01]"
		android:scheme="nfc"/>
</intent-filter>
```

This “Activity” displays a dialog box with =”/SIM.*/[AID01]” as message

- Applications [app02] and [app03]
  - Application [app02] is signed with certificate [cert02]
  - Application [app03] is signed with certificate [cert03]
  - Define an “Activity” which listens an “intent-filter” as follows

```
<intent-filter>
	<action
	android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
	<category android:name="android.intent.category.DEFAULT"/>
	<data
		android:host="secure"
		android:pathPattern="/SIM.*/[AID02]"
		android:scheme="nfc"/>
</intent-filter>
```

- This “Activity” display a dialog box with text =”/SIM.*/[AID02] from app02” as message for application [app02]
- This “Activity” display a dialog box with text =”/SIM.*/[AID02] from app03” as message for application [app03]

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID01.	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	

Step	Direction	Sequence	Expected Result
6	DUT -> UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	Only a dialog box containing "/SIM.*[AID01]" is displayed
8	User → DUT	Close Dialog box	
9	User → DUT	Repeat steps 2-5	
10	UICC → DUT	UICC sends EVT_TRANSACTION with AID02	No dialog box is displayed

15.5.3.4.2 Test Sequence No 2: Unicast

Initial Conditions

- Dut is running in "unicast" mode (default after device power cycle)
- Applets with [AID01] and [AID02] as AID are installed on the UICC
- Access Control is
  - Allowing communication between applet [AID01] and [app01], [app03]
  - Blocking any communication between applet [AID01] and [app02]
  - Allowing communication between applet [AID02] and any applications
- Following applications are installed in the following order: [app02], [app03], [app01]
- Application [app01]
  - Signed with certificate [cert01]
  - Define an "Activity" which listens an "intent-filter" as follows

```
<intent-filter>
       <action
       android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
       <category android:name="android.intent.category.DEFAULT"/>
       <data
             android:host="secure"
             android:pathPattern="/SIM.*/.*"
             android:scheme="nfc"/>
</intent-filter>
```

This "Activity" displays a dialog box with text ="/SIM.*/.*" as message

- Applications [app02] and [app03]
  - Application [app02] is signed with certificate [cert02]
  - Application [app03] is signed with certificate [cert03]
  - Define an "Activity" which listens an "intent-filter" as follows

```
<intent-filter>
    <action android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
    <category android:name="android.intent.category.DEFAULT"/>
```

```
    <data
        android:host="secure"
       android:pathPattern="/SIM.*/[AID01]"
       android:scheme="nfc"/>
</intent-filter>
```

- This “Activity” displays a dialog box with text =”/SIM.*/[AID01] from app02” as message for application [app02]
- This “Activity” displays a dialog box with text =”/SIM.*/[AID01] from app03” as message for application [app03]

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD → DUT	Perform RF protocol initialisation	
4	PCD → DUT	Using the **APDU application,** send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT -> UICC	Send EVT_Field_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	Only a dialog box containing “/SIM.*/[AID01] from app03” is displayed
8	User → DUT	Close Dialog box	
9	User → DUT	Repeat steps 2-5	
10	UICC → DUT	UICC sends EVT_TRANSACTION with AID02	Only a dialog box containing “/SIM.*/.*” is displayed

15.5.3.5 Application Permission for using Open Mobile API

Test Purpose
To ensure that android application has required permissions to use OMAPIs and the Transaction events.

Referenced requirement
- TS26_NFC_REQ_130

Initial Conditions
- APDU_TestApplication.cap is installed on the UICC and is Selectable at AID 01.
- The DUT is powered on

15.5.3.5.1 Test Sequence No 1

Initial Conditions

- **MobileApplication** using Open Mobile APIs is installed on the DUT.
- The following permission is NOT declared in the **MobileApplication** manifest:

```
<permission
android:name="org.simalliance.openmobileapi.SMARTCARD"/>
```

Step	Direction	Sequence	Expected Result
1	App → DUT	Attempt to create a SEService object	"SecurityException" is thrown by the system

15.5.3.6 EVT Transaction is received only by the appropriate application based on priority scheme

Test Purpose

Check that in Unicast mode the EVT Transaction is received only by the appropriate application based on priority scheme.

Referenced requirement

- TS26_NFC_REQ_150
- TS26_NFC_REQ_150.1

15.5.3.6.1 Test Sequence No 1: Check installation order

Initial Conditions

- DUT is running in "unicast" mode (default mode after device power cycle)
- Applet with [AID01] is installed on the UICC
- Access Control is
  - Allowing Communication between applet [AID01] and [app01], [app02]
- Following applications are installed in the following order: [app01], [app02]
- Application [app01]
  - Signed with certificate [cert01]
  - The "android:priority" is set to "100"
  - Define an "Activity" which listens to an "intent-filter" as follows

```
<intent-filter>
       <action
       android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
       <category android:name="android.intent.category.DEFAULT"/>
       <data
              android:host="secure"
              android:pathPattern="/SIM.*/[AID01]"
              android:scheme="nfc"/>
</intent-filter>
```

- Applications [app02]

- Application [app02] is signed with certificate [cert02]
- The “android:priority” is set to “100”
- Define an “Activity” which listens an “intent-filter” as follows

```
<intent-filter>
        <action
        android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
        <category android:name="android.intent.category.DEFAULT"/>
        <data
              android:host="secure"
              android:pathPattern="/SIM.*/[AID01]"
              android:scheme="nfc"/>
</intent-filter>
```

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD-> DUT	Perform RF protocol initialisation	
4	PCD->DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT->UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	Transaction Event Activity [app01] is started.

15.5.3.6.2 Test Sequence No 2: Check that “android : priority” has priority over the installation order

Initial Conditions

- DUT is running in “unicast” mode (default mode after device power cycle)
- Applet with [AID01] is installed on the UICC
- Access Control is
  - Allowing Communication between applet [AID01] and [app01], [app02]
- Following applications are installed in the following order: [app02], [app01]
- Application [app01]
  - Signed with certificate [cert01]
  - The “android:priority” is set to “100”
  - Define an “Activity” which listens to an “intent-filter” as follows

```
<intent-filter>
        <action
        android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
        <category android:name="android.intent.category.DEFAULT"/>
```

```
        <data
              android:host="secure"
              android:pathPattern="/SIM.*/[AID01]"
              android:scheme="nfc"/>
</intent-filter>
```

- Applications [app02]
- Application [app02] is signed with certificate [cert02]
- The “android:priority” is set to “10”
- Define an “Activity” which listens an “intent-filter” as follows

```
<intent-filter>
       <action
       android:name="com.gsma.services.nfc.action.TRANSACTION_EVENT"/>
       <category android:name="android.intent.category.DEFAULT"/>
       <data
              android:host="secure"
              android:pathPattern="/SIM.*/[AID01]"
              android:scheme="nfc"/>
</intent-filter>
```

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on.	
2	PCD	Power on RF field	
3	PCD-> DUT	Perform RF protocol initialisation	
4	PCD->DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
5	PCD	Power off RF field	
6	DUT->UICC	Send EVT_FIELD_OFF	
7	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	Transaction Event Activity [app01] is started.

15.6 VOID

15.7 Multiple Card Emulation Environment

15.7.1 General overview

This section provides test cases for checking features linked to Multiple Card Emulation Environment.

The list of conformance requirements tested within this section is listed in the table in section 15.7.2.

15.7.2 Conformance requirements

<table>
<tr><td>TS26_NFC_REQ_063</td><td>When an NFC application is uninstalled, the device SHALL remove all information related to this application from the routing table.</td></tr>
<tr><td>TS26_NFC_REQ_063.1</td><td>When an NFC application is disabled, the device SHALL remove all information related to this application from the NFC routing table.

Note: this also applies for preinstalled applications that cannot be uninstalled but that can only be disabled.</td></tr>
<tr><td>TS26_NFC_REQ_064</td><td>When an NFC application is updated or re-enabled, the device SHALL update the routing table according to the new registration information (removing/adding elements).
Note: Static & dynamic elements from the previous version will be removed and static elements from the new version will be added.</td></tr>
<tr><td>TS26_NFC_REQ_068</td><td>The device SHALL provide a mechanism to handle AID Conflict.</td></tr>
<tr><td>TS26_NFC_REQ_068.01</td><td>AID Conflict resolution SHOULD follow the same mechanisms whether NFC services registration is dynamic or static.</td></tr>
<tr><td>TS26_NFC_REQ_068.02</td><td>When managing AID conflict resolution, the device SHALL follow the end-user preferences.</td></tr>
<tr><td>TS26_NFC_REQ_095</td><td>The device SHALL support routing to active CEEs.</td></tr>
<tr><td>TS26_NFC_REQ_127</td><td>As per TS26_NFC_REQ_055 devices SHALL implement classes and methods as described below.
Note: Refer to the Javadoc linked to this document for more details.
<table>
<tr><th colspan="2">“com.gsma.services.nfc.NfcController”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>nested classes (NfcController.Callbacks)</td><td>All methods except “onCardEmulationMode”</td></tr>
<tr><td>NfcController</td><td>All methods except “disableCardEmulationMode, enableCardEmulationMode, isCardEmulationEnabled”</td></tr>
</table>
<table>
<tr><th colspan="2">“com.gsma.services.nfc.AIDGroup”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
<tr><td>AIDGroup</td><td>All methods</td></tr>
</table>
<table>
<tr><th colspan="2">“com.gsma.services.nfc.OffHostService”</th></tr>
<tr><th>Classes</th><th>Methods</th></tr>
</table></td></tr>
</table>

	OffHostService	All methods
TS26_NFC_REQ_127.1	APIs SHALL also manage “Off-Host” services registered statically through the Manifest	
TS26_NFC_REQ_127.2	All the services/group created through these APIs SHALL stay persistent (still available after a power off/on of the device).	
TS26_NFC_REQ_128	The device SHALL handle a “Long Press” on all “Tap&Pay” menu entries.	
TS26_NFC_REQ_128.1	When a “Long Press” is done on a “Tap&Pay” menu entry, the device SHALL send the following intent to the application that has created this entry. intent: com.gsma.services.nfc.SELECT_DEFAULT_SERVICE	
TS26_NFC_REQ_134	The device SHALL provide an additional menu entry in “Settings” in order to enable/disable group of AIDs (as defined by Android) belonging to the category “Other”. A group of AIDs SHALL only be enabled/disabled as a single unit.	
TS26_NFC_REQ_134.1	When there is an overflow in the NFC router table, the menu entry SHOULD display: - A banner representing the groups of AIDs belonging to the category “Other” (and optionally the group description) with its current status (enabled/disabled) and a way for disabling/enabling it - A visual indication representing the NFC Controller capacity and showing 1. The space used by the selected group 2. If enablement of the selected group can fit with the remaining space of the NFC Controller routing table	
TS26_NFC_REQ_134.2	The menu SHOULD be hidden to the end user until the first time an NFC Service cannot be added in the NFC Controller routing table and thereafter the menu is visible.	
TS26_NFC_REQ_134.3	When the menu entry is opened, the status of NFC services group displayed by the menu entry SHALL reflect the actual status of the current NFC Controller routing table.	
TS26_NFC_REQ_135	When an application is trying to register new AIDs belonging to the category “Other” and there is no automatic solution to solve any routing table overflow (as defined in REQ_143), the device SHALL - Inform the end user that some NFC Services proposed by the application cannot be used. A message SHALL provide the description of the group(s) of AIDs (android:description) which cannot be activated. - Propose the end user should disable some previously installed NFC services using the feature described in TS26_NFC_REQ_134 in order to free some NFC Controller routing table space to be able to register all AIDs needed by the current application When one AID from a group of AIDs cannot be added in the NFC Controller routing table, the entire group of AIDs SHALL not be enabled.	
TS26_NFC_REQ_136	When a customer is selecting a service from the “Tap&Pay” menu there is no automatic solution to solve any routing table overflow (as defined in	

<table>
<tr><td></td><td>REQ_143), the device SHALL
• Inform the end user that activation of the selected NFC services cannot be performed
• Propose the end user should disable some previously installed NFC services using the feature described in TS26_NFC_REQ_134 in order to free some NFC Controller routing table space
If the end user doesn't disable enough NFC services to allow activation of the selected "Tap&Pay" menu, previous "Tap&Pay" entry SHALL stay active and the end users selection is cancelled.</td></tr>
<tr><td colspan="2">Note 1: Only Dynamic registration is currently tested.</td></tr>
<tr><td>TS26_NFC_REQ_143</td><td>When the device needs to update the routing table because of new AID registration; AND
• there is not enough space in the routing table for all required AIDs while maintaining the current default route; AND
• there would be enough space in the routing table for all required AIDs if the default AID route was changed to one of the other card emulation environments,
THEN the device SHALL change the default route automatically to one of those other card emulation environments and SHALL update the routing table accordingly.
In such situation, there SHALL be no user interaction at all.

Note: this mechanism SHALL be totally transparent for end users as this is a solution resolving the chipset routing table size shortage.</td></tr>
<tr><td>TS26_NFC_REQ_147</td><td>In the "Tap&Pay" menu, the user selection has precedence and the behaviour of the device is consistent across different handset states.
The following scenarios SHALL be applied.

Note 1: If Android is changing the behaviour then this requirement will change accordingly.
Note 2: GSMA strongly recommend that service providers register the Off-Host AIDs in the Android OS as defined by Android.

<table>
<tr><th>Scenario</th><th>Screen ON (Screen Lock/Unlock)</th><th>Screen OFF</th><th>Switched Off</th></tr>
<tr><td>Default AID route is set to HCE.
No App in the Payment category has been installed.</td><td>For any AID which is not registered in the "Other" category, contactless selection fails with error code '6A82'.</td><td>For any AID which is not registered in the "Other" category, contactless selection fails with error code '6A82'.</td><td>For any AID which is not registered in the "Other" category, contactless selection fails with error code '6A82'.</td></tr>
</table>
</td></tr>
</table>

	Default AID route is set to Off-Host No App in the Payment category has been Installed.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.	For any AID which is not registered in the "Other" category, APDUs go to Off-Host.
	Default AID route is set to Off-Host The user selected an Off-Host-based service in Tap&Pay menu.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.
	Default AID route is set to Off-Host The user selected a HCE-based service in Tap&Pay menu.	APDUs intended for the selected HCE service go to HCE.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.
	Default AID route is set to HCE The user selected a HCE-based service in Tap&Pay menu.	APDUs intended for the selected HCE service go to HCE.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.	For APDUs intended for the selected HCE service, contactless selection fails with error code ’6A82’.
	Default AID route is set to HCE The user selected an Off-Host-based service in Tap&Pay menu.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.	APDUs intended for the selected Off-Host service go to Off-Host.
TS26_NFC_REQ_148	The device SHALL not change the default AID route in response to changes in device state (such as screen off, power off).			
TS26_NFC_REQ_148.1	The same behaviour SHALL be implemented when the mobile device is set in Flight Mode with NFC ON.			

15.7.3 Test Cases

15.7.3.1 Dynamic AIDs Registration APIs – “com.gsma.services.nfc.NfcController” class

Test Purpose

Ensure DUT implements correctly all APIs related to Dynamic AIDs Registration for “com.gsma.services.nfc.NfcController” class (as described in the GSMA NFC Handset Requirements and its Javadoc).

Referenced requirement

- TS26_NFC_REQ_127
- TS26_NFC_REQ_127.1

15.7.3.1.1 Test Sequence No 1: defineOffHostService, valid call

Initial Conditions

- A Secure Element name for UICC exists and is stored in [SEName]
- An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance, call the “defineOffHostService” method with the following parameters: • description: “*Description”* • SEName: [SEName]	An “OffHostService” instance is returned
2	App → DUT	From the “OffHostService” instance returned by the “defineOffHostService” method call, “getDescription” method	• No exception thrown by the system • String “Description” is returned

15.7.3.1.2 Test Sequence No 2: defineOffHostService, null description

Initial Conditions

A Secure Element name for UICC exists and is stored in [SEName]
An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance, call the “defineOffHostService” method with the following parameters: • description: *null* • SEName: [SEName]	IF DUT supports O_ANDROID_API_V8_OR_LATER: “IllegalArgumentException” is thrown by the system ELSE: “IllegalArgumentException” is thrown by the system OR *null* is returned

15.7.3.1.3 Test Sequence No 3: defineOffHostService, invalid SEName

Initial Conditions
An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance,call the “defineOffHostService” method with the following parameters: • description: “*Description”* • SEName: “*Invalid”*	“IllegalArgumentException” is thrown by the system OR a) An “OffHostService” instance is returned b) “getDescription” method is called from the returned instance c) No exception thrown by the system and String “Description” is returned

15.7.3.1.4 Test Sequence No 4: defineOffHostService, null description and invalid SEName

Initial Conditions
An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance, call the “defineOffHostService” method with the following parameters: • description: *null* • SEName: *“Invalid”*	IF DUT supports O_ANDROID_API_V8_OR_LATER: “IllegalArgumentException” is thrown by the system ELSE: “IllegalArgumentException” or “NullPointerException” is thrown by the system

15.7.3.1.5 Test Sequence No 5: Off-host service with Tap&Pay

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are pre-installed.
- NFC is enabled on the DUT
- Applet with [AID01] as AID is installed on the UICC
- Application [app01]
  - |An “Off-Host” service has been previously created using GSMA APIs with
    - “myOffHostService01-App01” as description
    - A banner where it is displayed “myOffHostService01-App01”
    - A group with "payment" as category and containing one AID named [AID01]

- |An instance of the “NfcController” class has been retrieved successfully and is not *null*

) The default route is set to HCE (See section 2.6.1)

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	“myOffHostService01-App01” banner is one of the entries of the list
2	User → DUT	Select the entry with “myOffHostService01-App01” banner	
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
4	User → PCD	Power on the field	
5	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
6	User → PCD	Power off the field	
7	App → DUT	From the “NfcController” instance of [app01], call the “getOffHostServices” method	A list containing one instance of “OffHostService“ class is returned
8	App → DUT	From the “NfcController” instance of [app01], call the “deleteOffHostService” method with the instance of the “OffHostService“ class returned in the previous sequence	
9	App → DUT	From the “NfcController” instance, call the “getOffHostServices” method	List of returned “OffHostService” instance is *null*
10	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	“myOffHostService01-App01” banner is no more part of the list
11	User → PCD	Power on the field	
12	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW != 90 00 is returned

15.7.3.1.6 Test Sequence No 6: deleteOffHostService, null service

Initial Conditions
Application [app01]
- |Application does not define an “Off-Host” service
- |An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	
2	App → DUT	From the “NfcController” instance of [app01], call the “deleteOffHostService” method with the following parameter: • service: *null*	IF DUT supports O_ANDROID_API_V8_OR_LATER: “IllegalArgumentException” is thrown by the system ELSE: 3 Options: • No exception is thrown • “IllegalArgumentException” is thrown by the system • “NullPointerException” is thrown by the system
3	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	Services shall be the same than the ones listed in Step 1

15.7.3.1.7 Test Sequence No 7: getOffHostServices, multiple applications, GSMA APIs and manifest

Initial Conditions
- Application [app01]
  - |An “Off-Host” service has been created previously using GSMA APIs with “myOffHostService01-App01” as description
  - |An “Off-Host” service has been defined in the Manifest with “myOffHostService02-App01” as description
  - |An instance of the “NfcController” class has been retrieved successfully and is not *null*
- Application [app02]
  - |An “Off-Host” service has been created previously using GSMA APIs with “myOffHostService01-App02” as description
  - |An “Off-Host” service has been defined in the Manifest with “myOffHostService02-App02” as description
- Applications [app01] and [app02] have been launched previously for registering its NFC services

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance of [app01], call the “getOffHostServices” method	List of returned “OffHostService” instances is not *null* and contains only two elements
2	App → DUT	From the 2 “OffHostService” instances returned by the previous sequence, call the “getDescription” method	Result of these 2 calls is “myOffHostService01-App01” and “myOffHostService02-App01” Note: Any order is valid

15.7.3.1.8 Test Sequence No 8: getOffHostServices, no off-host services defined

Initial Conditions

- Application [app01]
  - |Application does not define an “Off-Host” service
  - |An instance of the “NfcController” class has been retrieved successfully and is not *null*
- Application [app02]
  - |An “Off-Host” service has been created previously using GSMA APIs with “myOffHostService01-App02” as description
  - |An “Off-Host” service has been defined in the Manifest with “myOffHostService02-App02” as description
- Application [app02] has been launched previously for registering its NFC services

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “NfcController” instance of [app01], call the “getOffHostServices” method	List of returned “OffHostService” instances is *null*

15.7.3.1.9 Test Sequence No 9: getDefaultOffHostService, single application

Initial Conditions

- Application [app01]
  - |An “Off-Host” service has been created previously using GSMA APIs with
    - “myOffHostService01-App01” as description
    - A banner where it is displayed “myOffHostService01-App01”
    - A group with "payment" as category and containing one or several AIDs
  - |An “Off-Host” service has been defined in the Manifest with
    - “myOffHostService02-App01” as description
    - A banner where it is displayed “myOffHostService02-App01”
    - A group with "payment" as category and containing one or several AIDs
  - |An instance of the “NfcController” class has been retrieved successfully and is not *null*

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01]	
2	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myOffHostService01-App01” and “myOffHostService02-App01” as banner are displayed
3	User → DUT	Select the entry with “myOffHostService01-App01” banner	
4	User → DUT	Set [app01] to foreground	
5	App → DUT	From the “NfcController” instance, call the “getDefaultOffHostService” method	An instance of the “OffHostService” class is returned
6	App → DUT	From the “OffHostService” instance returned by the previous sequence, call the “getDescription” method	String “myOffHostService01-App01” is returned
7	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	
8	User → DUT	Select entry with “myOffHostService02-App01” banner	
9	User → DUT	Set [app01] to foreground	
10	App → DUT	From the “NfcController” instance, call the “getDefaultOffHostService” method	An instance of the “OffHostService” class is returned
11	App → DUT	From the “OffHostService” instance returned by the previous sequence, call the “getDescription” method	String “myOffHostService02-App01” is returned

15.7.3.1.10 Test Sequence No 10: getDefaultOffHostService, multiple applications

Initial Conditions

- Application [app01]
  - |Application does not define an “Off-Host” service
  - |An instance of the “NfcController” class has been retrieved successfully and is not *null*
- Application [app02]
  - |An “Off-Host” service has been created previously using GSMA APIs with
    - “myOffHostService01-App02” as description
    - A banner where it is displayed “myOffHostService01-App02”
    - A group with "payment" as category and containing one or several AIDs
  - |An “Off-Host” service has been defined in the Manifest with
    - “myOffHostService02-App02” as description

- A banner where it is displayed “myOffHostService02-App02”
- A group with "payment" as category and containing one or several AIDs

- Application [app02] has been launched previously for registering its NFC services

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01]	
2	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myOffHostService01-App02” and “myOffHostService02-App02” as banner are displayed
3	User → DUT	Select entry with “myOffHostService01-App02” banner	
4	User → DUT	Set [app01] to foreground	
5	App → DUT	From the “NfcController” instance, call the “getDefaultOffHostService” method	*null* is returned
6	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	
7	User → DUT	Select entry with “myOffHostService02-App02” banner	
8	User → DUT	Set [app01] to foreground	
9	App → DUT	From the “NfcController” instance, call the “getDefaultOffHostService” method	*null* is returned

15.7.3.1.11 Test Sequence No 11: Tap&Pay after reboot

Initial Conditions

- Application [app01]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App01” as description
  - A banner where it is displayed “myOffHostService01-App01”
  - A group with "payment" as category and containing one AID named [AID01]

- Application [app01] has been launched previously for registering its NFC services
- Applet with [AID01] as AID is installed on the UICC
- NFC is enabled on the DUT

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	User→ DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 1 entry with “myOffHostService01-App01” as banner is displayed
2	User→ DUT	Select entry with “myOffHostService01-App01” banner	
3	User→ DUT	Power off the Device and then power on the Device	
4	User→ DUT	From the “Setting” menu, open the “Tap&Pay” entry	“myOffHostService01-App01” banner is selected
5	User→ DUT	While the field is off, place the DUT in the area where the field will be powered on	
6	User→ PCD	Power on the field	
7	PCD→ DUT DUT→ UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned

15.7.3.2 Dynamic AIDs Registration APIs – “com.gsma.services.nfc.OffHostService” class

Test Purpose

Ensure DUT implements correctly all APIs related to Dynamic AIDs Registration for “com.gsma.services.nfc.OffHostService” class (as described in the GSMA NFC Handset Requirements and its Javadoc).

Referenced requirements

- TS26_NFC_REQ_127
- TS26_NFC_REQ_127.1
- TS26_NFC_REQ_127.2

15.7.3.2.1 Test Sequence No 1: getLocation

Initial Conditions

- Application [app01]

  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “getLocation” method	Result is equals to [SEName]

15.7.3.2.2 Test Sequence No 2: defineAidGroup, CATEGORY_PAYMENT

Initial Conditions

- Application [app01]
  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *“myGroup01”* • Category: *android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant*	An “AidGroup” instance is returned
2	App → DUT	From the “AidGroup” instance returned by the previous sequence, call the “getCategory” method	A string equals to the *android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT* constant is returned
3	App → DUT	From the “AidGroup” instance returned by the previous sequence, call the “getDescription” method	String “*myGroup01*” is returned

15.7.3.2.3 Test Sequence No 3: defineAidGroup, CATEGORY_OTHER

Initial Conditions

- Application [app01]
  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *“myGroup01”* • Category: *android.nfc.cardemulation.CardEmulation.CATEGORY_OTHER* constant	An “AidGroup” instance is returned
2	App → DUT	From the “AidGroup” instance returned by the previous sequence, call the “getCategory” method	A string equals to the android.nfc.cardemulation.CardEmulation.CATEGORY_OTHER constant is returned
3	App → DUT	From the “AidGroup” instance returned by the previous sequence,call the “getDescription” method	String “myGroup01” is returned

15.7.3.2.4 Test Sequence No 4: defineAidGroup, null description

Initial Conditions

- Application [app01]
  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *null* • Category: *android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant*	IF DUT supports O_ANDROID_API_V8_OR_LATER: “IllegalArgumentException” is thrown by the system. ELSE: “IllegalArgumentException” or “NullPointerException” is thrown by the system

15.7.3.2.5 Test Sequence No 5: defineAidGroup, invalid category

Initial Conditions

- Application [app01]
  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *“myGroup01”* • Category: *“XX”*	“IllegalArgumentException” is thrown by the system

15.7.3.2.6 Test Sequence No 6: getAidGroups, deleteAidGroup

Initial Conditions

- Application [app01]
  - |Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
    - “myOffHostService-App01” as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *“myGroup01”* • Category: *android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant*	An “AidGroup” instance is returned
2	App → DUT	From the “OffHostService” instance in [myService], call the “defineAidGroup” method with the following parameter: • Description: *“myGroup02”* • Category: *android.nfc.cardemulation.CardEmulation.CATEGORY_OTHER constant*	An “AidGroup” instance is returned
3	App → DUT	From the “OffHostService” instance, call the “getAidGroups” method	List of returned “AidGroup” instances is not *null* and contains only two elements
4	App → DUT	The expected result from the previous step • 1st instance is stored in [grp01] • 2nd instance is stored in [grp02] From [grp01] instance call the “getDescription” method Result is stored in [description]	Result of this call is “*myGroup01*” or “*myGroup02*” string

Step	Direction	Sequence	Expected Result
5	App → DUT	From [grp01] instance the call “getCategory” method Result is stored in [category]	- If [description] equals to “myGroup1” [category] shall be equal to the value of android.nfc.cardemulation.CardEmulation .CATEGORY_PAYMENT - If [description] equals to “myGroup2” [category] shall be equal to the value of android.nfc.cardemulation.CardEmulation .CATEGORY_OTHER
6	App → DUT	From [grp02] instance call the “getDescription” method Result is stored in [description02]	- [description02] is different from [description] - [description02] is equal to “myGroup1” or “myGroup2”
7	App → DUT	From [grp02] instance call the “getCategory” method Result is stored in [category02]	- If [description02] equals to “myGroup1” [category02] shall be equal to the value of android.nfc.cardemulation.CardEmulation .CATEGORY_PAYMENT - If [description02] equals to “myGroup2” [category02] shall be equal to the value of android.nfc.cardemulation.CardEmulation .CATEGORY_OTHER
8	App → DUT	From the unique “OffHostService”, call the “deleteAidGroup” method with “AidGroup” instance stored in [grp01]	No exception thrown by the system
9	App → DUT	From the “OffHostService” instance, call the “getAidGroups” method Instance is stored in [grp02]	List of returned “AidGroup” instances is not *null* and contains only one element
10	App → DUT	From instance returned in the previous sequence, call the “getDescription” method	Returned string is different than string stored in [description]
11	App → DUT	From instance returned in the previous sequence, call the “getCategory” method	Returned string is different than string stored in [category]
12	App → DUT	From the unique “OffHostService”, call the “deleteAidGroup” method with “AidGroup” instance stored in [grp02]	No exception thrown by the system
13	App → DUT	From the “OffHostService”, call the “getAidGroups” method	List of returned “AidGroup” instances is null

15.7.3.2.7 Test Sequence No 7: setBanner

Initial Conditions

- Application [app01]
  - |An “Off-Host” service has been defined in the Manifest with

- "myOffHostService" as description
- A banner where it is displayed "myOffHostService"
- A group with "payment" as category and containing one or several AIDs

- |An instance of the "NfcController" class has been retrieved successfully and is not *null*
- Application contains an 260x96 dp image defined as resource [res01]. This image is displaying "myNewBanner"

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01]	
2	User → DUT	From the "Setting" menu, open the "Tap&Pay" entry	At least, 1 entry with "myOffHostService" as banner is displayed
3	User → DUT	Set [app01] to foreground	
4	App → DUT	From the "NfcController" instance, call the "getOffHostServices" method	List of returned "OffHostService" instances is not *null* and contains only one element
5	App → DUT	From the "OffHostService" instance returned by the previous sequence, call the "setBanner" method with the following parameter: • Banner: "Drawable" object built from application resource [res01]	
6	App → DUT	From the "OffHostService" instance stored in [myService], call the "commit" method	
7	User → DUT	From the "Setting" menu open the "Tap&Pay" entry	List of entries contains a banner where "myNewBanner" is displayed

15.7.3.2.8 Test Sequence No 8: Persistence of "OffHostService"

- Application [app01]
  - Using the following details, application called "defineOffHostService" method
    - "myOffHostService" as description
    - [SEName] as Secure Element name ([SEName]identifies UICC)
  - From the returned "OffHostService" instance, application called the "commit" method

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01] "Off-Host" service as defined in the initial condition is created	

Step	Direction	Sequence	Expected Result
2	User → DUT	Switch off DUT	
3	User → DUT	Switch on DUT	
4	User → DUT	Launch [app01]	
5	App → DUT	[app01]retrieves an instance of the "NfcController" class	instance is not *null*
6	App → DUT	From the "NfcController" instance call the "getOffHostServices" method	List of returned "OffHostService" instances is not *null* and contains only one element
7	App → DUT	From the "OffHostService" instance contained in the list call the "getDescription" method	String "myOffHostService" is returned

15.7.3.3 Dynamic AIDs Registration APIs – "com.gsma.services.nfc.AidGroup" class

Test Purpose

Ensure DUT implements correctly all APIs related to Dynamic AIDs Registration for "com.gsma.services.nfc.AidGroup" class (as described in the GSMA NFC Handset Requirements and its Javadoc).

Referenced requirement

- TS26_NFC_REQ_127
- TS26_NFC_REQ_127.2

15.7.3.3.1 Test Sequence No 1: AIDGroup, general usage

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are pre-installed
- Application [app01]

  - |Using the following details, application called "defineOffHostService" method and stored the returned "OffHostService" instance in [myService]
    - "myOffHostService" as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)
  - |Using the following details, application created a group and stored the returned "AidGroup" instance in [myGroup01]
    - "myGroup01" as description
    - android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant as category
    - A banner where it is displayed "myOffHostService"
  - Creation of [myGroup01] is committed

- Applets with [AID01] and [AID02] as AIDs are installed on the UICC
- NFC is enabled on the DUT
- The default route is set to HCE (See section 2.6.1)

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01]	
2	User → DUT	From the “Setting” menu open the “Tap&Pay” entry	List of entries does not contain a banner where “myOffHostService” is displayed
3	User → DUT	Set [app01] to foreground	
4	App → DUT	From the “AidGroup” instance stored in [myGroup01] call the “addNewAid” method with the following parameter: Aid: [AID01]	
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
6	User → PCD	Power on the field	
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW != 90 00 is returned
8	CD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	SW != 90 00 is returned
9	User → PCD	Power off the field	
10	User → DUT	Set [app01] to foreground	
11	App → DUT	From the “OffHostService” instance stored in [myService], call the “commit” method	
12	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	List of entries contains a banner where “myOffHostService” is displayed
13	User → DUT	Select entry with “myOffHostService” banner	
14	User → PCD	Power on the field	

Step	Direction	Sequence	Expected Result
15	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
16	User → PCD	Power off the field	
17	User → DUT	Set [app01] to foreground	
18	App → DUT	From the “AidGroup” instance stored in [myGroup01], call the “addNewAid” method with the following parameter: Aid: [AID02]	
19	App → DUT	From the “OffHostService” instance stored in [myService], call the “commit” method	
20	User → PCD	Power on the field	
21	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
22	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned
23	User → PCD	Power off the field	
24	User → DUT	Set [app01] to foreground	
25	App → DUT	From the “AidGroup” instance stored in [myGroup01] call the “removeAid” method with the following parameter: Aid: [AID01]	
26	App → DUT	From the “OffHostService” instance stored in [myService] call the “commit” method	
27	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	List of entries contains a banner where “myOffHostService” is displayed
28	User → PCD	Power on the field	

Step	Direction	Sequence	Expected Result
29	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned

15.7.3.3.2 Test Sequence No 2: Persistence of “AidGroup”

Initial Conditions

- Application [app01]

- Using the following details, application called “defineOffHostService” method and stored the returned “OffHostService” instance in [myService]
  - “myOffHostService” as description
  - [SEName] as Secure Element name ([SEName] identifies UICC)
- Using the following details, application created a group as part of [myService]
  - “myGroup01” as description
  - android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT constant as category
  - A banner where it is displayed “myOffHostService”
  - [AID01] has been registered
- Creation of the service and the group is committed
- Applet with [AID01] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	Launch [app01] “Off-Host” service as defined in the initial condition is created	
2	User → DUT	Switch DUT off	
3	User → DUT	Switch DUT on	
4	User → DUT	From the “Setting” open menu the “Tap&Pay” entry	List of entries contains a banner where “myOffHostService” is displayed
5	User → DUT	Select entry with “myOffHostService” banner	
6	User → DUT	Launch [app01]	
7	APP → DUT	[app01] retrieves an instance of the “NfcController” class	Instance is not *null*
8	APP → DUT	From the “NfcController” instance call the “getDefaultOffHostService()” method	An “OffHostService” instance is returned

Step	Direction	Sequence	Expected Result
9	APP → DUT	From the “OffHostService” instance call the “getDescription” method	String “myOffHostService” is returned
10	APP → DUT	From the “OffHostService” instance call the “getAidGroups” method Instance is stored in [grp01]	List of returned “AidGroup” instances is not *null* and contains only one element
11	APP → DUT	From [grp01] instance call the “getDescription” method	String “myGroup01” is returned
12	APP → DUT	From [grp01] instance call the “getCategory” method	Value of the constant android.nfc.cardemulation.CardEmulation CATEGORY.PAYMENT is returned
13	APP → DUT	While the field is off, place the DUT in the area where the field will be powered on	
14	User → PCD	Power on the field	
15	PCD → DUT DUT → UICC	Send “SELECT APDU” command with [AID01] as parameter	SW = 90 00 is returned

15.7.3.4 “Long Press” on “Tap&Pay” menu entries

Test Purpose

Ensure DUT implements correctly all the additional GSMA features around the “Tap&Pay” menu

Referenced requirement

- TS26_NFC_REQ_128
- TS26_NFC_REQ_128.1

15.7.3.4.1 Test Sequence No 1: Off-host service defined in manifest

Initial Conditions

- Application defined an “Off-Host” payment service [serv01] in its Manifest
  … <aid-group android:description="@string/aiddescription"
  android:category="payment">
  …
- Application has registered following “Intent Filter” for one of its activity [activity01]

```
<!-- LongPress on "Tap&Pay" entries -->

      <intent-filter>

      <action
android:name="com.gsma.services.nfc.SELECT_DEFAULT_SERVIC
```

```
E"/>
<category
android:name="android.intent.category.DEFAULT"/>
</intent-filter>
```

when the activity is receiving the event it should display “Hello” on the screen

Step	Direction	Sequence	Expected Result
1	App → DUT	Open the “Tap&Pay” menu	Service [serv01] is one entry of the “Tap&Pay” menu
2	App → DUT	Execute a “Long Press” on the [serv01] entry	Activity [activity01] is launched in foreground

15.7.3.4.2 Test Sequence No 2: Off-host service defined using GSMA APIs

Initial Conditions

- Application [app01] defined an “Off-Host” payment service [serv01] using GSMA APIs (i.e. category of the AID group is set to `android.nfc.cardemulation.CardEmulation.CATEGORY_PAYMENT`)
  Service has to be registered when application is launched the first time
- Application has registered following “Intent Filter” for one of its activity [activity01]

```
<!-- LongPress on "Tap&Pay" entries -->

<intent-filter>
    <action
    android:name="com.gsma.services.nfc.SELECT_DEFAULT_SERVIC
    E"/>
    <category
    android:name="android.intent.category.DEFAULT"/>
    </intent-filter>
```

when the activity is receiving the event it should display “Hello” on the screen

Step	Direction	Sequence	Expected Result
1	App → DUT	Launch the application [app01] for registering the “Off-Host” payment service	
2	App → DUT	Open the “Tap&Pay” menu	Service [serv01] is one entry of the “Tap&Pay” menu
3	App → DUT	Execute a “Long Press” on the [serv01] entry	Activity [activity01] is launched in foreground

15.7.3.5 Routing in Multiple CEE model

Test Purpose

To ensure routing between different CEE environment is performed correctly in a multiple CEE model.

Referenced requirement

- TS26_NFC_REQ_095
- TS26_NFC_REQ_147

Initial Conditions

- The DUT is powered on
- HCI initialization has been performed successfully.
- NFC is enabled on the DUT

15.7.3.5.1 Test Sequence No 1: Off-host payment service via manifest, host “other” service

Initial Conditions

- No AID is registered in the CLF routing table.
- Applet with [AID01] as AID is installed on the UICC.
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01] defined an “Off-Host” payment service [serv01] in its Manifest.
  - With group "payment" as category and containing one AID as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="payment">
<aid-filter android:name=" AID01"/>
</aid-group>
```

  - your service [serv01] declaration must contain an intent filter in the meta-data element as define below

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.OFF_HOST_APDU_SERVICE"/>
</intent-filter>
```

  - A banner where it is displayed “myOffHostService01”

```
< offhost-apdu-service
android:apduServiceBanner="@drawable/ myOffHostService01>
</offhost-apdu-service>
```

- Application [app02] defined a “Host” non-payment service [serv02] in its Manifest.

with group "other" as category and containing one AID as defined below

```
<aid-group android:description="@string/aiddescription"
```

```
android:category="other">
<aid-filter android:name=" AID02"/>
</aid-group>
```

- your service [serv02] declaration must contain an intent filter

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.HOST_APDU_SERVICE"/>
</intent-filter>
```

- Application [app02] should respond to SELECT Command for AID 2 with response APDU ’9000’ with data ’01 02’

Step	Direction	Sequence	Expected Result
1	App → DUT	Install the application [app01] for registering the “Off-Host” for payment services Install the [app02] for registering the “Host” for other (non-payment) services	
2	App → DUT	Open the “Tap&Pay” menu	Service [serv01] is one entry as banner “myOffHostService01” in the “Tap&Pay” menu
3	User → DUT	Select “myOffHostService01” banner	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned As UICC applet will answer to the AID 1 Select.
7	PCD → DUT	Send “SELECT APDU” command with AID 2 as parameter	HCE application will answer to the AID 2 Select. SW: 90 00 is returned with data ’01 02’
8	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned As UICC applet will answer to the AID 1 Select.

15.7.3.5.2 Test Sequence No 2: Off-host payment service via GSMA APIs

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App01” as description
  - A banner where it is displayed “myOffHostService-App01”
  - A group with "payment" as category and containing one AID named [AID01]
- Application [app01] has been launched previously for registering its NFC services
- Applets with [AID01] & [AID02] as AID are installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu open the “Tap&Pay” entry	At least, 1 entry with “myOffHostService-App01” as banner is displayed
2	User → DUT	Select entry with “myOffHostService01-App01” banner	
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
4	User → PCD	Power on the field	
5	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	Contactless selection fails with SW: 6A 82

15.7.3.5.3 Test Sequence No 3: Default route HCE, host payment service (selected in Tap&Pay), off-host payment service via GSMA APIs

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defines “HCE” service as follows
  - “myHCEService-App01” as description
  - A banner where it is displayed “myHCEService-App1”
  - A group with "payment" as category and containing one AID named [AID01]
  - When it is selected from a POS, SW:90 00 is returned

- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App02” as description
  - A banner where it is displayed “myOffHostService-App02”
  - A group with "payment" as category and containing one AID named [AID02]
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myHCEService-App01” and “myOffHostService-App02” as banner are displayed
2	User → DUT	Select entry with “myHCEService-App01” banner	
3	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
4	User → PCD	Power on the field	
5	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	Contactless selection fails with SW: 6A 82

15.7.3.5.4 Test Sequence No 4: Default route HCE, host payment service, off-host payment service via GSMA APIs (selected in Tap&Pay), “other” service via GSMA APIs

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defineds “HCE” service as follows
  - “myHCEService-App01” as description
  - A banner where it is displayed “myHCEService-App1”
  - A group with "payment" as category and containing one AID named [AID01]
  - When it is selected from a POS, SW:90 00 is returned
- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with

- "myOffHostService-App02" as description
- A banner where it is displayed "myOffHostService-App02"
- A group with "payment" as category and containing one AID named [AID02]
- A group with "other" as category and containing one AID named [AID03]

- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC
- An applet with [AID03] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the "Setting" menu, open the "Tap&Pay" entry	At least, 2 entries with "myHCEService-App01" and "myOffHostService-App02" as banner are displayed
2	User → DUT	Select entry with "myHCEService-App01" banner	
3	User → DUT	Power off Device	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID01 as parameter	Contactless selection fails with SW: 6A 82
7	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID02 as parameter	Contactless selection fails with SW: 6A 82
8	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID03 as parameter	SW: 90 00 is returned

15.7.3.5.5 Test Sequence No 5: device off, "other" routing

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]

  This application defines "HCE" service as follows
  - "myHCEService-App01" as description
  - A banner where it is displayed "myHCEService-App1"

- A group with "other" as category and containing one AID named [AID01]
- When it is selected from a POS, SW:90 00 is returned + extra data "48 43 45"

- Application [app02]
  An "Off-Host" service has been created previously using GSMA APIs with
  - "myOffHostService-App02" as description
  - A banner where it is displayed "myOffHostService-App02"
  - A group with "other" as category and containing one AID named [AID02]
  - When it is selected from a POS, SW:90 00 is returned + extra data "4f 46 46 48 4f 53"
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	Power off Device	
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power on the field	
4	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID01 as parameter	Contactless selection fails with SW: 6A 82
5	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID02 as parameter	SW: 90 00 is returned with extra data "4f 46 46 48 4f 53"

15.7.3.5.6 Test Sequence No 6: HCE entry selected in Tap&Pay, device off, payment routing

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defines "HCE" service as follows
  - "myHCEService-App01" as description
  - A banner where it is displayed "myHCEService-App1"
  - A group with "payment" as category and containing one AID named [AID01]
  - When it is selected from a POS, SW:90 00 is returned + extra data "48 43 45"
- Application [app02]
  An "Off-Host" service has been created previously using GSMA APIs with
  - "myOffHostService-App02" as description

- A banner where it is displayed “myOffHostService-App02”
- A group with "payment" as category and containing one AID named [AID02]
- When it is selected from a POS, SW:90 00 is returned + extra data “4f 46 46 48 4f 53”

- [app01] is installed before [app02]
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myHCEService-App01” and “myOffHostService-App02” as banner are displayed
2	User → DUT	Select entry with “myHCEService-App01” banner	
3	User → DUT	Power off Device	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	Contactless selection fails with SW: 6A 82
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	Contactless selection fails with SW: 6A 82

15.7.3.5.7 Test Sequence No 7: off-host entry selected in Tap&Pay, device off, payment routing

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]

  This application defines “HCE” service as follows
  - “myHCEService-App01” as description
  - A banner where it is displayed “myHCEService-App1”
  - A group with "payment" as category and containing one AID named [AID01]
  - When it is selected from a POS, SW:90 00 is returned + extra data “48 43 45”

- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App02” as description
  - A banner where it is displayed “myOffHostService-App02”
  - A group with "payment" as category and containing one AID named [AID02]
  - When it is selected from a POS, SW:90 00 is returned + extra data “4f 46 46 48 4f 53”
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myHCEService-App01” and “myOffHostService-App02” as banner are displayed
2	User → DUT	Select entry with “myOffHostService-App02” banner	
3	User → DUT	Power off Device	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	Contactless selection fails with SW: 6A 82
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned with extra data “4f 46 46 48 4f 53”

15.7.3.5.8 Test Sequence No 8: screen off, “other” routing.

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defines “HCE” service as follows
  - “myHCEService-App01” as description
  - A banner where it is displayed “myHCEService-App1”

- A group with "other" as category and containing one AID named [AID01]
- When it is selected from a POS, SW:90 00 is returned + extra data "48 43 45"

- Application [app02]
  An "Off-Host" service has been created previously using GSMA APIs with
  - "myOffHostService-App02" as description
  - A banner where it is displayed "myOffHostService-App02"
  - A group with "other" as category and containing one AID named [AID02]
  - When it is selected from a POS, SW:90 00 is returned + extra data "4f 46 46 48 4f 53"
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC
- No default Tap&Pay service is selected

Step	Direction	Sequence	Expected Result
1	User → DUT	Ensure that the Device screen is off	
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power on the field	
4	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID01 as parameter	Contactless selection fails with SW: 6A 82 OR App01 (Host) responds : SW:90 00 is returned + extra data "48 43 45"
5	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID02 as parameter	SW: 90 00 is returned with extra data "4f 46 46 48 4f 53"

15.7.3.5.9 Test Sequence No 9: HCE entry selected in Tap&Pay, screen off, payment routing

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defines "HCE" service as follows
  - "myHCEService-App01" as description
  - A banner where it is displayed "myHCEService-App1"
  - A group with "payment" as category and containing one AID named [AID01]
  - When it is selected from a POS, SW:90 00 is returned + extra data "48 43 45"

- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App02” as description
  - A banner where it is displayed “myOffHostService-App02”
  - A group with "payment" as category and containing one AID named [AID02]
  - When it is selected from a POS, SW:90 00 is returned + extra data “4f 46 46 48 4f 53”
- [app01] is installed before [app02]
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myHCEService-App01” and “myOffHostService-App02” as banner are displayed
2	User → DUT	Select entry with “myHCEService-App01” banner	
3	User → DUT	Ensure that the Device screen is off	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	Contactless selection fails with SW: 6A 82 OR App01 (Host) responds: SW:90 00 is returned + extra data “48 43 45”
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	Contactless selection fails with SW: 6A 82

15.7.3.5.10 Test Sequence No 10: off-host entry selected in Tap&Pay, screen off, payment routing

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE. (See section 2.6.1)
- Application [app01]
  This application defines “HCE” service as follows

- “myHCEService-App01” as description
- A banner where it is displayed “myHCEService-App1”
- A group with "payment" as category and containing one AID named [AID01]
- When it is selected from a POS, SW:90 00 is returned + extra data “48 43 45”

- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App02” as description
  - A banner where it is displayed “myOffHostService-App02”
  - A group with "payment" as category and containing one AID named [AID02]
  - When it is selected from a POS, SW:90 00 is returned + extra data “4f 46 46 48 4f 53”
- Application [app02] has been launched previously for registering its NFC services
- An applet with [AID02] as AID is installed on the UICC

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu, open the “Tap&Pay” entry	At least, 2 entries with “myHCEService-App01” and “myOffHostService-App02” as banner are displayed
2	User → DUT	Select entry with “myOffHostService-App02” banner	
3	User → DUT	Ensure that the Device screen is off	
4	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
5	User → PCD	Power on the field	
6	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	Contactless selection fails with SW: 6A 82
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned with extra data “4f 46 46 48 4f 53”

15.7.3.6 AID Conflict Resolution Mechanism

Test Purpose

Ensure DUT provide AID Conflict Resolution mechanism.

Referenced requirement

- TS26_NFC_REQ_068

- TS26_NFC_REQ_068.01
- TS26_NFC_REQ_068.02

Initial Conditions
None

15.7.3.6.1 Test Sequence No 1

Initial Conditions

No default service for category “Other” is present in the DUT

- Applet with [AID01] as AID is installed on the UICC.

  When the Applet is selected it shall send a response APDU 9000 + ‘4f 46 46 48 4f 53 54

- NFC is enabled on the DUT

Application [app01]

- An “Off-Host” service has been created using GSMA APIs with

  A group with "other" as category and containing one AID named [AID01]

Application [app02]

- defined as “Host” service in its Manifest.
- With group "other" as category and containing [AID01] as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
<aid-filter android:name=" AID01"/>
</aid-group>
```

- NFC application [app02] service declaration must contain an intent filter in the meta-data element as define below

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.HOST_APDU_SERVICE"/>
</intent-filter>
```

- When the application is selected it shall send a response APDU 9000 + ‘48 43 45’’

- Install the [app01] and [app02] on to the DUT for registering their respective NFC services.

- Application [app01] is launched and registered its AID

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
2	User → PCD	Power on the field	
3	PCD → DUT DUT → UICC	"SELECT APDU" command is sent with AID01 as parameter	DUT should present a message asking the user which service is to be invoked. See Note
4	User → DUT	Select "app01"	
5	User → PCD	Power Off the field	
6	User → PCD	Power ON the field	
7	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID01 as parameter	SW: 90 00 + extra data '4f 46 46 48 4f 53 54' is returned by the off-host application
Note: TS26_NFC_REQ_068.02 is implemented in Android by asking the user to select the preferred service.			

15.7.3.7 Routing table update after NFC Application is uninstalled or disabled in Multiple CEE model

Test Purpose

Ensure DUT removes all of the application entries related to a disabled or uninstalled application.

Referenced requirement

- TS26_NFC_REQ_063
- TS26_NFC_REQ_063.1
- TS26_NFC_REQ_064

15.7.3.7.1 Test Sequence No 1: Application uninstalled

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- In the NFC Controller the default AID route is set to HCE (see section 2.6.1)
- Application [app01] defined an "OffHost" other service [serv01] in its Manifest.
  - With group "other" as category and containing AID01 as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
```

```
<aid-filter android:name= [AID 01]/>
</aid-group>
```

o your service [serv01] declaration must contain an intent filter

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.OFFHOST_APDU_SERVICE"/>
</intent-filter>
```

- Applet with [AID01] as AID is installed on the UICC. [AID01] is of size 16 bytes.
- When the applet is selected, it shall send the response APDU 9000 + '4f 46 46 48 4f 53 54'
- NFC is enabled on the DUT
- Application [Fillrouteapp01] is installed on the DUT
  - |Using the following details, application called "defineOffHostService" method and stored the returned "OffHostService" instance in [myService]
    - "OffHost-Fillrouteapp01" as description
    - [SEName] as Secure Element name ([SEName] identifies UICC)

  - |Using the following details, application created a group and stored the returned "AidGroup" instance in [myGroup01]
    - "myGroup01" as description
    - android.nfc.cardemulation.CardEmulation.CATEGORY_OTHER constant as category
  - Creation of [myGroup01] is committed

- Every [TestAID xx] are of size 16 bytes and for the same target. [TestAID xx] SHALL be any random AIDs of 16 bytes and is not equal to [AID 01].

Step 1–3 is used to get the maximum capacity (N) of the routing table of the DUT. Step 6 is used to fill the routing table (N-1) so that only AID01 of the [app01] can be installed.

Step	Direction	Sequence	Expected Result
1	App → DUT	From the "AidGroup" instance stored in [myGroup01], call the "addNewAid" method with the following parameter: Aid: [TestAID 01]	
2	App → DUT	From the "OffHostService" instance stored in [myService] call the "commit" method	

Step	Direction	Sequence	Expected Result
3	App → DUT	Repeat step 1 and 2 for Aid: [TestAID 02] , Aid: [TestAID 03] and so on until "InsufficientResourcesException" exception is thrown Store "N" which is the number of the AIDs that can be installed on the device before "InsufficientResourcesException" exception is thrown	
4	User → DUT	Uninstall the [Fillrouteapp01]	
5	User → DUT	Install the [Fillrouteapp01]	
6	App →DUT	Repeat step 1 and 2 for "N-1" [TestAID XX]. The TestAIDs used in this step has to be different from the TestAIDs used in the step 1-3 .	No exception is expected
7	User → DUT	Install the Application [app01] on to the DUT	No exception is expected
8	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
9	User → PCD	Power ON the field	
10	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID1 as parameter	SW: 90 00 + extra data '4f 46 46 48 4f 53 54' is returned by the host application
11	User → DUT	From the "Setting -> apps" menu, remove the Application [app01]	
12	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
13	User → PCD	Power ON the field	
14	PCD → DUT DUT → UICC	Send "SELECT APDU" command with AID1 as parameter	SW: not equal 90 00

15.7.3.7.2 Test Sequence No 2: Application disabled and re-enabled

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled

- In the NFC Controller the default AID route is set to HCE (see section 2.6.1)
- Application [app01] defined an “OffHost” other service [serv01] in its Manifest.
  - With group “other” as category and containing AID01 as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
<aid-filter android:name= [AID 01]/>
</aid-group>
```

  - your service [serv01] declaration must contain an intent filter

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.OFFHOST_APDU_SERVICE"/>
</intent-filter>
```

- Applet with [AID01] as AID is installed on the UICC. [AID01] is of size 16 bytes.
- When the applet is selected, it shall send the response APDU 9000 + ‘4f 46 46 48 4f 53 54’
- NFC is enabled on the DUT

Step	Direction	Sequence	Expected Result
1	User → DUT	Install the Application [app01] on to the DUT	No exception is expected
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power ON the field	
4	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID1 as parameter	SW: 90 00 + extra data ‘4f 46 46 48 4f 53 54’ is returned by the host application
5	User → DUT	Disable the Application [app01] using “adb shell pm disable <package_name>”	Check that the adb command reports success
6	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
7	User → PCD	Power ON the field	
8	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID1 as parameter	SW: not equal 90 00

Step	Direction	Sequence	Expected Result
9	User → DUT	Enable the Application [app01] using “adb shell pm enable <package_name>”	Check that the adb command reports success.
10	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
11	User → PCD	Power ON the field	
12	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID1 as parameter	SW: 90 00 + extra data ‘4f 46 46 48 4f 53 54’ is returned by the host application

15.7.3.8 Routing update when Application is updated / upgraded in Multiple CEE model.

Test Purpose
To ensure that when an NFC application is updated, the device SHALL update the routing table according to the new registration information

Referenced requirement
- TS26_NFC_REQ_064

Test execution:

- The DUT is powered on
- HCI initialization has been performed successfully.
- NFC is enabled on the DUT

Initial Conditions
- The default AID route is set to HCE. (See section 2.6.1)
- Applet with [AID 01] as AID is installed on the UICC. [AID 01] is of size 16 bytes.

Application [app01]

An “Off-Host” service has been previously created using GSMA APIs with “myOffHostService01-App01” as description
A banner where it is displayed “myOffHostService01-App01”
A group with "other" as category and containing one AID named [AID 01]

An instance of the “NfcController” class has been retrieved successfully and is not null
When the [app01] is selected it shall send the response APDU 9000 + ‘4f 46 46 48 4f 53 54’

- Application [app02]

  Defined an “Host” service [serv02] in its Manifest.

  With group " other " as category and containing AID01 as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
<aid-filter android:name= [AID 01]/>
</aid-group>
```

- your service [serv02] declaration must contain an intent filter in the meta-data element as define below

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.HOST_APDU_SERVICE"/>
</intent-filter>
```

- When the [app02] is selected it shall send the response APDU 9000 + ‘48 43 45’’

15.7.3.8.1 Test Sequence No 1: Off-host service

Step	Direction	Sequence	Expected Result
1	User → DUT	Install Application [app01]	
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power ON the field	
4	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID1 as parameter	SW: 90 00 + extra data ‘4f 46 46 48 4f 53 54’ is returned by the off-host application

Step	Direction	Sequence	Expected Result
5		Now update the [app01] with [AID 02] via manifest and install it onto the DUT <aid-group android:description="@string/aiddescription" android:category="other"> <aid-filter android:name=[AID 02]/> </aid-group>	
6	User → PCD	Remove the DUT from the RF field and Place it again in the RF field	
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with [AID 01] as parameter	SW other than 90 00 will be returned

15.7.3.8.2 Test Sequence No 2: Host service

Step	Direction	Sequence	Expected Result
1	User → DUT	Install Application [app02]	
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power ON the field	
4	PCD → DUT DUT → UICC	Send “SELECT APDU” command with [AID 01] as parameter	SW: 90 00 + extra data ‘48 43 45’ is returned by the host application
5		Now update the [app02] with [AID 02] via manifest and install it onto the DUT <aid-group android:description="@string/aiddescription" android:category="other"> <aid-filter android:name=[AID 02]/> </aid-group>	
6	User → PCD	Remove the DUT from the RF field and Place it again in the RF field	

Step	Direction	Sequence	Expected Result
7	PCD → DUT DUT → UICC	Send “SELECT APDU” command with [AID 01] as parameter	SW other than 90 00 will be returned

15.7.3.9 NFC Controller routing table

Test Purpose

Ensure DUT handles correctly situations when NFC Controller routing is full.

Referenced requirement

- TS26_NFC_REQ_134
- TS26_NFC_REQ_134.2
- TS26_NFC_REQ_134.3
- TS26_NFC_REQ_135
- TS26_NFC_REQ_136

15.7.3.9.1 Test Sequence No 1: REQ_134 menu not available by default

Initial Conditions

- A Factory Reset has been performed
- Application [app01]
  An “Off-Host” service has been defined in the Manifest with
  - “myOffHostService-App01” as description
  - A group with "other" as category and containing one AID named [AID01]

Step	Direction	Sequence	Expected Result
1	User → DUT	Install application [app01]	
2	User → DUT	Open the “Setting” menu	An additional menu allowing the end-user to enable/disable group of AIDs belonging to the category “other” is not available or visible to the end user

15.7.3.9.2 VOID

15.7.3.9.3 Test Sequence No 3: Default route HCE, off-host service added via Tap&Pay menu, check REQ_134 menu

Initial Conditions

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to HCE (see section 2.6.1)
- Application [app01]
  An “Off-Host” service has been defined in the Manifest with
  - “myOffHostService-App01” as description

- A group with "payment" as category and containing one AID named [AID01].
  Group description is “myOtherGroup-App01”

- Application [app02]
  An “Off-Host” service has been created previously using GSMA APIs with
  - “myOffHostService-App02” as description
  - A banner where it is displayed “myOffHostService-App02”
  - A group with "payment" as category containing [AID01] and [AID02]
    Group description is “myOtherGroup-App02”
- Application [app01] is installed before application [app02]
- In the “Tap&Pay” menu, “myOffHostService-App01” is selected
- After installing application [app01] and application [app02], the NFC Controller routing table is not full

- Application [Fillrouteapp02]:
- It dynamically creates a group within an Off host service with "other" as category.
- It dynamically fills this group with different TestAIDFillxx as defined bellow until the InsufficientResourceException is thrown:

AID byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	0x01 for TestAIDFill01 0x02 for TestAIDFill02 … 0x64 for TestAIDFill100 ….. 0xFF for TestAIDFill255															
value		0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x03

- After application [app01] and application [app02] are launched, application [Fillrouteapp02] is launched to fill the NFC Controller routing table.

Step	Direction	Sequence	Expected Result
1	User → DUT	From the “Setting” menu open the “Tap&Pay” entry	At least, 2 entries with “myOffHostService-App01” and “myOffHostService-App02” as banner are displayed. “myOffHostService-App01” banner is selected

Step	Direction	Sequence	Expected Result
2	User → DUT	Select Entry with “myOffHostService-App02” banner	) User is informed that the NFC Service proposed by the application cannot be used.) Displayed message shall propose to the end-user a way to disable NFC services previously installed|
3	User → DUT	Open the “Setting” menu	An additional menu allowing the end-user to enable/disable group of AIDs belonging to the category “other” is visible
4	User → DUT	Open the additional “Setting” menu	Groups “myOffHostService-App01” “myOffHostService-App02” are not displayed as entry

15.7.3.9.4 Test Sequence No 4: Default route HCE, off-host service added via manifest, service enabled, contactless session

Initial Conditions

-) All NFC applications on the DUT are uninstalled except applications that are preinstalled
-) The default AID route is set to HCE (see section 2.6.1)

-)\| Application [app01]
  An “Off-Host” service has been defined in the Manifest with
  - “myOffHostService-App01” as description
  - A group with "other" as category and containing one AID named [AID01]. Group description is “myOtherGroup-App01”
-)\| Application [app01] is not yet installed on the DUT
-) Application [Fillrouteapp02]:
-) It dynamically creates a group within an Off host service with "other" as category.
-) It dynamically fills this group with different TestAIDFillxx as defined bellow until the InsufficientResourceException is thrown:

AID byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	0x01 for TestAIDFill01 0x02 for TestAIDFill02 … 0x64 for TestAIDFill100 ….. 0xFF for TestAIDFill255															
value		0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x10	0x11	0x12	0x13	0x14	0x15	0x03

- Application|[Fillrouteapp02] is launched to fill the NFC Controller routing table.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install application [app01]	- User is informed that the NFC Service proposed by the application cannot be used.| - Displayed message shall propose to the end-user a way to disable NFC services previously installed |
2	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
3	User → PCD	Power on the field	
4	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is not returned
5	User → PCD	Power off the field	
6	User → DUT	Remove the DUT from the area where the field is powered on	
7	User → DUT	Open the “Setting” menu	An additional menu allowing the end-user to enable/disable group of AIDs belonging to the category “other” is visible
8	User → DUT	Open the additional “Setting” menu	- At least, the following groups are displayed: - “myOtherGroup-App01” - a set of “myOtherGroup-NFC”[N] - “myOtherGroup-App01” group is seen as disabled and cannot be enabled
9	User → DUT	Disable the group created by application [Fillrouteapp02]	The group created by application [Fillrouteapp02] is disabled|
10	User → DUT	Enable “myOtherGroup-App01”	“myOtherGroup-App01” group is seen as enabled|
11	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
12	User → PCD	Power on the field	

Step	Direction	Sequence	Expected Result
13	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
14	PCD → DUT DUT → UICC	Send “SELECT APDU” command with TestAIDFill01	SW: 90 00 is not returned

15.7.3.10 Tap&Pay menu – routing of APDUs for payment services

Test Purpose

Test the DUT for correct configuration of routing table in response to changes made in the Tap and Pay menu settings:

- Default Processor
- Default Payment Application

Referenced requirement

- TS26_NFC_REQ_147
- TS26_NFC_REQ_148
- TS26_NFC_REQ_148.1

Initial Conditions

- **ReferenceApplication.cap** is installed with AID_REF on the UICC
- **APDU Application** to send APDUs according to the reference transaction
- NFC enabled on the DUT

15.7.3.10.1 Test Sequence No 1: Tap&Pay routing to UICC

Initial Conditions

- App01: an android application which registers an off_host_apdu_service for AID_REF and specifies the category as “payment”.
- App02: an android application which registers host_apdu_service (HCE) for AID_REF and specifies the category as “payment”. This application will respond to the APDU application similar to the ReferenceApplication.cap
- All NFC applications on the DUT are uninstalled except applications that are preinstalled

NOTE: It is not possible to configure scenarios 1 and 2 in TS26_NFC_REQ_147. This is because at least 1 payment service must be selected as default in the Tap&Pay settings menu. As a result, these test scenarios have been omitted from the table below.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	Install App02	The application is installed successfully
3	User → DUT	In the NFC Controller set the default AID route to UICC (see section 2.6.1.2).	
4	User → DUT	In NFC Tap&Pay settings set App01 as the default payment service	The active payment service has been set to App01, (Off Host)
5	PCD → DUT DUT → UICC	With the screen off perform the reference transaction using the **APDU application**	App01 (Off Host) responds
6	PCD → DUT DUT → UICC	With the screen on and the device locked perform the reference transaction using the **APDU application**	App01 (Off Host) responds
7	PCD → DUT DUT → UICC	With the screen on and the device unlocked perform the reference transaction using the **APDU application.**	App01 (Off Host) responds
8	PCD → DUT DUT → UICC	With the device in flight mode perform the reference transaction using the APDU application (with NFC switched ON)	App01 (Off Host) responds
9	PCD → DUT DUT → UICC	With the device switched off perform the reference transaction using the **APDU application**	App01 (Off Host) responds
10	User → DUT	In the NFC Controller set the default AID route to UICC (see section 2.6.1.2).	
11	User → DUT	In NFC Tap&Pay settings set App02 as the default payment service	The active payment service has been set to App02, (Host)
12	PCD → DUT DUT → UICC	With the screen off perform the reference transaction using the **APDU application**	App02 (Host) selection fails with error code ‘6A82’ OR App02 (Host) responds

Step	Direction	Sequence	Expected Result
13	PCD → DUT DUT → UICC	With the screen on and the device locked perform the reference transaction using the **APDU application**	APDUs are routed to the host
14	PCD → DUT DUT → UICC	With the screen on and the device unlocked perform the reference transaction using the **APDU application.**	APDUs are routed to the host
15	PCD → DUT DUT → UICC	With the screen on and the device in flight mode perform the reference transaction using the **APDU application**. (with NFC switched ON)	APDUs are routed to the host
16	PCD → DUT DUT → UICC	With the device switched off perform the reference transaction using the **APDU application**	App02 (Host) selection fails with error code '6A82'

15.7.3.10.2 Test Sequence No 2: Tap&Pay routing to HCE

Initial Conditions

- App01: an android application which registers an off_host_apdu_service for AID_REF and specifies the category as "payment".
- App02: an android application which registers host_apdu_service (HCE) for AID_REF and specifies the category as "payment". This application will respond to the APDU application similar to the ReferenceApplication.cap
- All NFC applications on the DUT are uninstalled except applications that are preinstalled

NOTE: It is not possible to configure scenarios 1 and 2 in TS26_NFC_REQ_147. This is because at least 1 payment service must be selected as default in the Tap&Pay settings menu. As a result, these test scenarios have been omitted from the table below.

Step	Direction	Sequence	Expected Result
1	User → DUT	Install App01	The application is installed successfully
2	User → DUT	Install App02	The application is installed successfully
3	User → DUT	In the NFC Controller set the default AID route to HCE (see section 2.6.1.1).	

Step	Direction	Sequence	Expected Result
4	User → DUT	In NFC Tap&Pay settings set App01 as the default payment service	The active payment service has been set to App01, (Off Host)
5	PCD → DUT DUT → UICC	With the screen off perform the reference transaction using the **APDU application**	App01 (Off Host) responds
6	PCD → DUT DUT → UICC	With the screen on and the device locked perform the reference transaction using the **APDU application**	App01 (Off Host) responds
7	PCD → DUT DUT → UICC	With the screen on and the device unlocked perform the reference transaction using the **APDU application**.	App01 (Off Host) responds
8	PCD → DUT DUT → UICC	With the device in flight mode perform the reference transaction using the **APDU application**(with NFC switched ON)	App01 (Off Host) responds
9	PCD → DUT DUT → UICC	With the device switched off perform the reference transaction using the **APDU application**	App01 (Off Host) responds
10	User → DUT	In the NFC Controller set the default AID route to HCE (see section 2.6.1.1).	
11	User → DUT	In NFC Tap&Pay settings set App02 as the default payment service	The active payment service has been set to App02, (Host)
12	PCD → DUT DUT → UICC	With the screen off perform the reference transaction using the **APDU application**	App02 (Host) selection fails with error code '6A82' OR App02 (Host) responds
13	PCD → DUT DUT → UICC	With the screen on and the device locked perform the reference transaction using the **APDU application**	APDUs are routed to the host
14	PCD → DUT DUT → UICC	With the screen on and the device unlocked perform the reference transaction using the **APDU application**.	APDUs are routed to the host

Step	Direction	Sequence	Expected Result
15	PCD → DUT DUT → UICC	With the screen on and the device in flight mode perform the reference transaction using the **APDU application**. (with NFC switched ON)	APDUs are routed to the host
16	PCD → DUT DUT → UICC	With the device switched off perform the reference transaction using the **APDU application.**	App02 (Host) selection fails with error code '6A82'

15.7.3.11 Dynamic & Automatic switch of AID default Route

Test Purpose

The aims of these tests are to ensure the coexistence between HCE and UICC-based NFC services in the case were many AIDs are used & registered.

Referenced requirements:

- TS26_NFC_REQ_134
- TS26_NFC_REQ_134.1
- TS26_NFC_REQ_135
- TS26_NFC_REQ_143

15.7.3.11.1 Test Sequence No 1: One card emulation environment overflow – Automatic Management

This test ensure that the automatic route switching (without user interaction) feature works in a one ecosystem overflow scenario

Initial Conditions:

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to UICC. (See section 2.6.1.2)
- The UICC contain 3 cardlets with known AIDs [AID01, AID02, AID03].
- AID01, AID02, AID03 are available on the UICC
- AID01 is not registered by any application
- DUT is powered ON and DUT is unlocked and the screen is ON

- Dynamic_Other_HCE: An application able to register a configurable list of non-payment AID with a length of 16 bytes on HCE using the dynamic registration API of Android. [registerAidsForService()]
- The AIDs list used by the application SHALL be different then AIDs used by the 3 others applications

- Static_Other_255AIDs_OffHost: An application able to register a list of 255 non-payment AID with a length of 16 bytes on the OffHost (UICC) using the Manifest of the application
- The AIDs list used by the application SHALL be different than AIDs used by the 3 others applications

- Static_Other_2AIDs_HCE : An application able to register 2 AIDs with a length of 16 bytes on the Host (HCE) referred below as AID04 an AID05 from the Manifest
- Those 2 AIDs are not present in the list of AID used by any other application

- Static_Other_2AIDs_OffHost : An application able to register 2 AIDs with a length of 16 bytes on the OffHOST (UICC) from the Manifest of the application.
- The 2 AIDs chosen SHALL exist on the UICC, referred below as AID02 an AID03
- Those 2 AIDs are not present in the list of AID used by any other application

Step	Direction	Sequence	Expected Result
1	User → DUT	Unregister 254 TestAIDUICC that were registered using 2.6.1.2 procedure (keep one TestAIDUICC)	
2	User → DUT	Install Application Static_Other_2AIDs_OffHost	Installation successful Registration of the 2 OffHost AIDs is successful
3	User → DUT	Install Application Dynamic_Other_HCE	Installation successful
4	User → DUT	Use Dynamic_Other_HCE and register 255 HCE AIDs	No error while registering the AIDs
5	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
6	User → PCD	Power on the field	
7	PCD → DUT	Send “SELECT APDU” command with AID01 as parameter	SW: 6A 82 is returned [default route was previously switched to HCE and AID01 not reachable because not in routing table]
8	PCD → DUT	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned [AID02 is present in the routing table routed to UICC]
9	PCD → DUT	Send “SELECT APDU” command with AID03 as parameter	SW: 90 00 is returned [AID03 is present in the routing table routed to UICC]
10	User → DUT	Uninstall Dynamic_Other_HCE application	Uninstall is successful

Step	Direction	Sequence	Expected Result
11	User → DUT	Uninstall Static_Other_2AIDs_OffHost application	Uninstall is successful
12	User → DUT	Install Static_Other_2AIDs_HCE application	Install is successful Registration of the 2 Host AIDs is successful
13	User → DUT	Install Static_Other_255AIDs_OffHost application	Install is successful No error while registering the 255 AIDs
14	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
15	User → PCD	Power on the field	
16	PCD → DUT	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned [default route was previously switched to UICC]
17	PCD → DUT	Send “SELECT APDU” command with AID04 as parameter	SW: 90 00 is returned [AID04 is present in the routing table routed to HCE]
18	PCD → DUT	Send “SELECT APDU” command with AID05 as parameter	SW: 90 00 is returned [AID05 is present in the routing table routed to HCE]
19	User → DUT	Uninstall Static_Other_255AIDs_OffHost application	Uninstall is successful
20	User → DUT	Uninstall Static_Other_2AIDs_HCE application	Uninstall is successful

15.7.3.11.2 Test Sequence No 2: Both card emulation environment overflow - Without payment apps

The purpose of this test case is to ensure compliance with TS26_NFC_REQ_135.

Initial Conditions:

- All NFC applications on the DUT are uninstalled except applications that are preinstalled
- The default AID route is set to UICC. (See section 2.6.1.2)
- Know how many 16 bytes AIDs the Routing Table of the DUT may contain (RTS)
- See 2.6 section : “Procedure to identify the AID routing table max size”)
- The UICC contain 3 cardlets with known AIDs [AID01, AID02, AID03].
- AID01, AID02, AID03 are only available on the UICC

- AID01 is not registered by any application
- DUT is powered on and DUT is unlocked and the screen is ON
- Dynamic_Other_HCE : An application able to register a configurable list of non-payment AID with a length of 16 bytes on the HCE using the dynamic registration API of Android [registerAidsForService()]
- The AIDs list used by the application SHALL be different then AIDs used by any other applications. The AIDs of the application have a length of 16 bytes
- Dynamic_Other_OffHost : An application able to register a list of non-payment AID with a length of 16 bytes on the OffHost (UICC) using the GSMA API.
- The AIDs list used by the application SHALL be different than AIDs used by any other
- applications. The AIDs of the application have a length of 16 bytes

- Static_Other_2AIDs_HCE : An application able to register 2 AIDs with a length of 16 bytes on HCE referred below as AID04 an AID05 from the Manifest of the application
- Those 2 AIDs must not present in the list of AID used by any other application

- Static_Other_2AIDs_OffHost : An application able to register 2 AIDs with a length of 16 bytes on the OffHOST (UICC) using the Manifest of the Application.
- The 2 AIDs chosen are expected to exist on the UICC, referred below as AID02 an AID03 from the Manifest of the application
- Those 2 AIDs must not present in the list of AID used by any other application

Step	Direction	Sequence	Expected Result
1	User → DUT	Unregister 254 TestAIDUICC that were registered using 2.6.1.2 procedure (keep one TestAIDUICC)	
2	User → DUT	Install “Dynamic_Other_OffHost” application	Installation successful
3	User → DUT	Start “Dynamic_Other_OffHost” application and register RTS-2 AIDs	No error while registering the RTS-2 AIDs
4	User → DUT	Install “Static_Other_2AIDs_OffHost” application	Installation successful No error while registering the 2 AIDs
5	User → DUT	Install “Dynamic_Other_HCE” application	
6	User → DUT	User “Dynamic_Other_HCE” to write (RTS-1) AIDs	No error occurs

Step	Direction	Sequence	Expected Result
7	User → DUT	Install "Static_2AIDs_HCE" application	Installation is successful A message is displayed to the user (per REQ_135) Menu entry is available in “Settings” (per REQ_134) The group of AID registered by the "Static_2AIDs_HCE" application is disabled
8	User → DUT	Exit the menu (Home button)	It’s possible to exit menu
9	User → PCD	While the field is off, place the DUT in the area where the field will be powered on	
10	User → PCD	Power on the field	
11	PCD→ DUT	Send “SELECT APDU” command with AID01 as parameter	SW: 90 00 is returned
12	PCD → DUT	Send “SELECT APDU” command with AID02 as parameter	SW: 90 00 is returned
13	PCD → DUT	Send “SELECT APDU” command with AID03 as parameter	SW: 90 00 is returned
14	PCD → DUT	Send “SELECT APDU” command with AID04 as parameter	SW: 6A 82 is returned [not present in routing table]
15	PCD → DUT	Send “SELECT APDU” command with AID05 as parameter	SW: 6A 82 is returned [not present in routing table]
16	User → PCD	Power off the field	
17	User → DUT	Uninstall “Dynamic_Other_OffHost” application Uninstall “Static_Other_2AIDs_OffHost” application	Uninstall successful
18	User → DUT	Open the menu as defined by TS26_REQ_134 Enable the group defined by “Static_2AIDs_HCE”	
19	User → PCD	While the field is off, place the DUT in the area where the field will be powered on	

Step	Direction	Sequence	Expected Result
20	User → PCD	Power on the field	
21	PCD → DUT	Verify that default route is switched to HCE: Send “SELECT APDU” command with AID01 as parameter	SW: 6A 82 is returned
22	PCD → DUT	Verify that HostAID are now reachable Send “SELECT APDU” command with AID04 as parameter	SW: 90 00 is returned
23	PCD → DUT	Send “SELECT APDU” command with AID05 as parameter	SW: 90 00 is returned
24	User → PCD	Power off the field	
25	User → DUT	Uninstall all the apps	Uninstall is successful

15.8 Platform Dependant Properties

15.8.1 General overview

This section provides test cases for checking platform dependant properties.

The list of conformance requirements tested within this section is listed in the table in section 15.8.2.

15.8.2 Conformance requirements

TS26_NFC_REQ_132	The device SHALL implement classes and methods as described below: “com.gsma.services.utils.Handset” **Classes** / **Methods** Handset / getProperty, getVersion Note: this requirement fulfils the generic requirement TS26_NFC_REQ_092.

15.8.3 Test Cases

15.8.3.1 “getVersion” API

Test Purpose

Ensure DUT implements correctly the method used to retrieve the version of the GSMA APIs available in the device

Referenced requirement

- TS26_NFC_REQ_132

15.8.3.1.1 Test Sequence No 1

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance call “getVersion” method	No exception thrown by the system Minor version number of the returned value is between 0 and 999 Major version number of the returned value is between 5 and 2147483 The major version number must not be greater than the major version of TS.26[1]

15.8.3.2 “getProperty” API

Test Purpose

Ensure DUT implements correctly API used to retrieve characteristics of the device

Referenced requirement

- TS26_NFC_REQ_132

15.8.3.2.1 Test Sequence No 1: OMAPI

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance, call “getProperty” method with “OMAPI” constant as parameter	Returned value is “true”.
2	App → DUT	Create an instance of the “SEService” class (SIM Alliance Open Mobile API)	No exception thrown by the system

Step	Direction	Sequence	Expected Result
3	App → DUT	From the “SEService” instance call “getVersion” method	No exception thrown by the system

15.8.3.2.2 Test Sequence No 2: MULTIPLE_ACTIVE_CEE

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	• From the “Handset” instance call “getProperty” method with “MULTIPLE_ACTIVE_CEE” constant as parameter	If DUT supports O_MULTI_CEE_ON, returned value is "true". If DUT does not support O_MULTI_CEE_ON, returned value is "false".

15.8.3.2.3 Test Sequence No 3: HCI_SWP, BATTERY_LOW_MODE

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance call “getProperty” method with “HCI_SWP” constant as parameter	Returned value is “true”
2	App → DUT	From the “Handset” instance call “getProperty” method with “BATTERY_LOW_MODE” constant as parameter	If DUT supports O_BAT_LOW, returned value is "true". If DUT does not support O_BAT_LOW, returned value is "false".

15.8.3.2.4 Test Sequence No 4: BATTERY_POWER_OFF_MODE, FELICA, MIFARE_CLASSIC, MIFARE_DESFIRE

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance call “getProperty” method with “BATTERY_POWER_OFF_MODE” constant as parameter	If DUT supports O_BAT_OFF, returned value is "true". If DUT does not support O_BAT_ OFF, returned value is "false".
2	App → DUT	From the “Handset” instance call “getProperty” method with “FELICA” constant as parameter	If DUT supports O_CARD_EM_FELICA_UICC, returned value is "true". If DUT does not support O_CARD_EM_FELICA_UICC, returned value is "false".
3	App → DUT	From the “Handset” instance call “getProperty” method with “MIFARE_CLASSIC” constant as parameter	If DUT supports O_MIFARE_CLASSIC_RW, returned value is "true". If DUT does not support O_MIFARE_CLASSIC_RW, returned value is "false".
4	App → DUT	From the “Handset” instance call, “getProperty” method with “MIFARE_DESFIRE” constant as parameter	If DUT supports O_MIFARE_DESFIRE_RW, returned value is "true". If DUT does not support O_MIFARE_DESFIRE_RW, returned value is "false".

15.8.3.2.5 Test Sequence No 5: Invalid argument

Initial Conditions

- An instance of the “Handset” class has been retrieved successfully by the application and is not *null*

Step	Direction	Sequence	Expected Result
1	App → DUT	From the “Handset” instance call “getProperty” method with a integer value as parameter which is not part of the following list: 0, 1, 32, 33, 34, 35, 80, 144, 145	IF DUT supports O_ANDROID_API_V8_OR_LATER: “IllegalArgumentException” is thrown by the system ELSE: An exception is thrown by the system

15.9 Security

15.9.1 General overview

This section provides test cases for checking security requirements.

15.9.2 Conformance requirements

TS26_NFC_REQ_130.1	Protection level of all the permissions described in TS26_NFC_REQ_130 SHALL be set to the same level as “android.permission.NFC”. Note: Before Marshmallow version: android.permission.NFC is set to “dangerous”. From Marshmallow version: android.permission.NFC is set to “normal”.
TS26_NFC_REQ_131	The device SHALL request the following permission for receiving a Transaction event: - android.permission.NFC - com.gsma.services.nfc.permission.TRANSACTION_EVENT
TS26_NFC_REQ_163	The device SHALL not log any APDU or AID exchanged in a communication with an applet located in an SE (UICC, eSE, …).

15.9.3 Test Cases

15.9.3.1 Permissions

Ensure DUT implements correctly the requested permissions for using NFC services.

Referenced requirement

- TS26_NFC_REQ_130.1
- TS26_NFC_REQ_131

15.9.3.1.1 Test Sequence No 1: Protection level for NFC Permission

Initial Conditions

- Application [app01]
  Registers in its Manifest the following permissions:
  - android.permission.NFC
  - org.simalliance.openmobileapi.SMARTCARD
  - com.gsma.service.nfc.permission.TRANSACTION_EVENT
  Provides the following features
  - Retrieves the list of readers via SIMAlliance APIs
  - Displays a notification when a transaction event is received
- Application [app01] is built with the following parameters:
  - “compileSdkVersion” >= 23
  - “targetSdkVersion” >=23
  - “minSdkVersion”<23
- Application [app01] is not yet installed on the DUT
- Access Control is allowing communication between any applet in the UICC and [app01]

Step	Direction	Sequence	Expected Result

Step	Direction	Sequence	Expected Result
1	User → DUT	Install [app01] without using “adb install” command	For devices based on an Android release before “Marshmallow”, the framework is requesting to accept, at least, the following permissions: - org.simalliance.openmobileapi.SMARTCARD - com.gsma.service.nfc.permission.TRANSACTION_EVENT For devices based on “Marshmallow” or following Android releases, the framework is not requesting to accept the following permissions - org.simalliance.openmobileapi.SMARTCARD - com.gsma.service.nfc.permission.TRANSACTION_EVENT
2	App → DUT	Retrieve and display a list of available readers	Android is not requesting to accept any additional permissions
3	PCD	Power on RF field	|
4	PCD-> DUT	Perform RF protocol initialisation	|
5	PCD->DUT	Using the **APDU application**, send a SELECT command with AID01	**APDU Application** receives Status Word 90 00
6	PCD	Power off RF field	
7	DUT-> UICC	Send EVT_FIELD_OFF	
8	UICC → DUT	UICC sends EVT_TRANSACTION with AID01	The DUT does not request to accept any additional permissions The application displays a notification linked to the transaction event

15.9.3.1.2 Test Sequence No 2: Permissions for using NFC services

Initial Conditions

- Application [app01]
  Registers in its Manifest the following permissions:
  - android.permission.NFC
  - com.gsma.service.nfc.permission.TRANSACTION_EVENT
  Registers an activity for receiving a transaction event based on [AID01]
- Application [app02]
  Registers in its Manifest the following permissions:
  - android.permission.NFC

Registers an activity for receiving a transaction event based on [AID02]

- Application [app03]
  Registers in its Manifest the following permissions:
  - com.gsma.service.nfc.permission.TRANSACTION_EVENT
  Registers an activity for receiving a transaction event based on [AID03]

- Application [app04]
  Does not registers in its Manifest the following permissions:
  - android.permission.NFC
  - com.gsma.service.nfc.permission.TRANSACTION_EVENT
  Registers an activity for receiving a transaction event based on [AID04]

- Access Control is allowing communication between any applets in the UICC and any applications

Step	Direction	Sequence	Expected Result
1	App → DUT	Generate a transaction event (see procedure 2.6.3) based on [AID01]	Transaction Event Activity from [app01] is launched
2	App → DUT	Generate a transaction event (see procedure 2.6.3) based on [AID02]	Transaction event Activity from [app02] is not launched
3	App → DUT	Generate a transaction event (see procedure 2.6.3) based on [AID03]	Transaction event Activity from [app03] is not launched
4	App → DUT	Generate a transaction event (see procedure 2.6.3) based on [AID04]	Transaction event Activity from [app04] Is not launched

15.9.3.2 APDU Logs

Ensure DUT avoid to log any sensitive information such as APDU exchange

Referenced requirement

- TS26_NFC_REQ_163

15.9.3.2.1 Test Sequence No 1: APDU Logs for contactless transaction

Initial Conditions

- Application [app01] define an “OffHost” other service [serv01] in its Manifest.
  - With group “other” as category and containing AID01 as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
<aid-filter android:name= [AID 01]/>
```

```
</aid-group>
```

- your service [serv01] declaration must contain an intent filter

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.OFFHOST_APDU_SERVICE"/>
</intent-filter>
```

Registers in its Manifest the following permissions:
- android.permission.NFC
- org.simalliance.openmobileapi.SMARTCARD
- com.gsma.service.nfc.permission.TRANSACTION_EVENT

app01 is build to receive transaction event from AID01 cardlet.

- Applet with [AID01] as AID is installed on the UICC. [AID01] is of size 16 bytes.
  - When the cardlet is selected from the contactless interface, a transaction event is sent to the DUT containing additional data generated by the cardlet
- Access Control is allowing communication between any applet in the UICC and [app01]

Step	Direction	Sequence	Expected Result
1	User → DUT	While the field is off, place the DUT in the area where the field will be powered on	
2	User → PCD	Power on the field	
3	PCD → DUT DUT → UICC	Send “SELECT APDU” command with AID01 as parameter.	SW: 90 00 is returned App01 has received the push transaction event from the cardlet containing the additional data provided by the cardlet
4	User → PCD	Power off the field	
5	User →DUT	Extract the logcat “main” and “radio” logs of the devices using the following command: adb logcat -v time -d > main.txt adb logcat -b radio -v time -d > radio.txt	No occurrence of AID01 is found in logs No occurence of the additional data generated by the cardlet is found in logs

15.9.3.2.2 Test Sequence No 2: APDU Logs for OMAPI access

Initial Conditions

- Application [app01] define an “OffHost” other service [serv01] in its Manifest.
  - With group “other” as category and containing AID01 as defined below

```
<aid-group android:description="@string/aiddescription"
android:category="other">
<aid-filter android:name= [AID 01]/>
</aid-group>
```

  - your service [serv01] declaration must contain an intent filter

```
<intent-filter>
<action android:name =
"android.nfc.cardemulation.action.OFFHOST_APDU_SERVICE"/>
</intent-filter>
```

Registers in its Manifest the following permissions:
- android.permission.NFC
- org.simalliance.openmobileapi.SMARTCARD

- Applet with [AID01] as AID is installed on the UICC. [AID01] is of size 16 bytes.

Step	Direction	Sequence	Expected Result
1	DUT → UICC	Send “SELECT APDU” command with AID01 as parameter on the contact interface using OpenMobileAPI	SW: 90 00 is returned
2	User →DUT	Extract the logcat “main” and “radio” logs of the devices using the following command: adb logcat -v time -d > main.txt adb logcat -b radio -v time -d > radio.txt and verify if AID01 is found in the logs	No occurrence of AID01 is found

16 BlackBerry specific test cases

17 Windows Phone specific test cases

18 VOID

19 Other OS specific test cases

Other OS specific test cases can be added based on contributions.

Annex A Reference Application

The following Annex provides clarification on the application to be used to complete the reference transaction.

A.1 Description

The applet simulates an internal file structure described in paragraph A.3.

The operations permitted are the file selection described in section A.4, the file reading described in section A.4.2 and the file update that is described in paragraph A.4.3.

The applet also implements the External Authenticate command described in paragraph A.4.4.

A.2 AID

- Package A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 50
- Applet A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 41

A.3 Structure File

The structure file of the applet test is as follows:

5F 00 (DR) Folder

1F 00 (EF) First file in the folder initialized to 00

The file size is 128 byte.

A.4 Commands Permitted

A.4.1 SELECT

This command is used to select the applet, the directory (5F 00) or files (1F 00, 1F 01)

Code	Value	Meaning
CLA	00	
INS	A4	
P1	04 o 00	04 when you select the applet 00 when you select the directory or files
P2	00	
Lc	Data Length	
Data	Data	Applet AID or Directory AID or files AID

Table 11: Select command details

A.4.2 READ BINARY

This command is used to read the contents of the selected file

Code	Value	Meaning
CLA	00	
INS	B0	
P1	00	
P2	00	
Le	80	

Table 12: Read Binary command details

A.4.3 UPDATE BINARY

This command is used to update the contents of the selected file

Code	Value	Meaning
CLA	00	
INS	D6	
P1	00	
P2	00	
Lc	80	
Data	Data to be updated	

Table 13: Update Binary command details

A.4.4 EXTERNAL AUTHENTICATE

This command is used to verify the input data encrypted, to be equal to the applet's data decrypted.

The input data correspond to the string "00 01 02 03 04 05 06 07" encrypted 3DES with 3 keys (K1 = A0 A1 A2 A3 A4 A5 A6 A7, K2 = B0 B1 B2 B3 B4 B5 B6 B7, K3 = C0 C1 C2 C3 C4 C5 C6 C7) and CBC (ICV = D0 D1 D2 D3 D4 D5 D6 D7).

The applet decrypted input data, if the data correspond to the string in clear (00 01 02 03 04 05 06 07) the applet will respond with 90 00, otherwise with 69 84.

Code	Value	Meaning

Code	Value	Meaning
CLA	04	
INS	82	
P1	00	
P2	00	
Lc	08	
Data	9E EA C0 F9 4D 60 53 34	

Table 14: External Authenticate command details

A.5 Source Code (Java)

The Java Source Code can be obtained from the GSMA TSG NFC Public GitHub here:

https://github.com/GSMATerminals/NFC-Test-Book-Public

Annex B Reference to other test plan

The GSMA NFC Handset Test Book refers to test specification developed by other organisations (EMVCo, ETSI, 3GPP, GlobalPlatform, NFC Forum, OMA and SIMalliance). These organisations defined their own requirements for test benches, test applicability and pass criteria's.

B.1 SIMalliance

Reference test Specification: The test book refers to "SIMalliance Open Mobile API test specification for Transport API [5]

> "SIMalliance Open Mobile API test specification for Transport API" specifies a number of optional features for the device. The following table lists which optional features are mandatory according to GSMA requirements:

Options	Name	GSMA Status
access to the basic channel is blocked by the DUT	OP-002	Mandatory
access to the basic channel is allowed by the DUT	OP-003	SHALL not be supported
access to the default applet is blocked by the DUT	OP-011	Mandatory
access to the default applet is allowed by the DUT	OP-010	SHALL not be supported

Note: for some specific behaviour of the test tool when testing the "SIMalliance OMAPI Transport API Test Specification" [5], see section 2.5.1.1.

The following test cases are applicable according to the applicability table of the referred SIMalliance test specification:

Each test case listed below contains one, or more ID-s listed explicitly in "SIMalliance OMAPI Transport API Test Specification" [5]. The ID-s shall be handled as separate test cases.

The "TS.26 versions" column gives the item in the "Test Case number and description" column the applicable requirements version:

- Version x.y "onwards": if the requirement is applicable from this TS.26 version and for the later versions
- "Up to" Version x.y: if the requirement is applicable until this TS.26 version and it has been changed or replaced for the later TS.26 versions

TS.27 Numbering	SIMalliance Section [5]	Test case number and description	Test case IDs	TS.26 versions
6.3.1.6.1.1	6.1.1	SIMalliance APIs - Constructor: SEService(Context context, SEService.CallBack listener)	ID1 – ID6	6.0 onwards
6.3.1.6.1.2	6.1.2	SIMalliance APIs - Method: Reader[] getReaders()	ID1	6.0 onwards
6.3.1.6.1.3	6.1.3	SIMalliance APIs - Method: boolean isConnected()	ID1, ID2	6.0 onwards
6.3.1.6.1.4	6.1.4	SIMalliance APIs - Method: void shutdown()	ID1 - ID3	6.0 onwards
6.3.1.6.1.5	6.1.5	SIMalliance APIs - Method: String getVersion()	ID1	6.0 to 7.0
6.3.1.6.2.1	6.2.1	SIMalliance APIs - Method: void serviceConnected(SEService service)	ID1	6.0 onwards
6.3.1.6.3.1	6.3.1	SIMalliance APIs - Method: String getName()	ID1	6.0 onwards
6.3.1.6.3.2	6.3.2	SIMalliance APIs - Method SEService getSEService()	ID1	6.0 onwards
6.3.1.6.3.3	6.3.3	SIMalliance APIs - Method: boolean isSecureElementPresent()	ID1, ID2	6.0 onwards
6.3.1.6.3.4	6.3.4	SIMalliance APIs - Method: Session openSession()	ID1 – ID3	6.0 onwards
6.3.1.6.3.5	6.3.5	SIMalliance APIs - Method: void closeSessions()	ID1, ID2	6.0 onwards
6.3.1.6.4.1	6.4.1	SIMalliance APIs - Method: Reader getReader()	ID1, ID2	6.0 onwards
6.3.1.6.4.2	6.4.2	SIMalliance APIs - Method: byte[] getATR()	ID1 – ID3	6.0 onwards
6.3.1.6.4.3	6.4.3	SIMalliance APIs - Method: void close()	ID1, ID2	6.0 onwards
6.3.1.6.4.4	6.4.4	SIMalliance APIs - Method: boolean isClosed()	ID1, ID2	6.0 onwards
6.3.1.6.4.5	6.4.5	SIMalliance APIs - Method: void closeChannels()	ID1, ID2	6.0 onwards
6.3.1.6.4.6	6.4.6	SIMalliance APIs - Method: Channel openBasicChannel()	ID7	6.0 onwards

TS.27 Numbering	SIMalliance Section [5]	Test case number and description	Test case IDs	TS.26 versions
6.3.1.6.4.7	6.4.7	SIMalliance APIs - Method: Channel openLogicalChannel()	ID1, ID2, ID3b, ID5a, ID5b, ID5c, ID5d, ID6 – ID17	6.0 onwards
6.3.1.6.4.8	6.4.8	SIMalliance APIs - Method: Channel openLogicalChannel – Extended logical channels	ID1 – ID3	8.0 onwards
6.3.1.6.4.9	6.4.9	SIMalliance APIs - Method: Channel openBasicChannel (with P2)	ID7	8.0 onwards
6.3.1.6.4.10	6.4.10	SIMalliance APIs - Method: Channel openLogicalChannel (with P2)	ID1, ID2, ID3b, ID5a, ID5b, ID5c, ID5d, ID6 – ID20	8.0 onwards
6.3.1.6.4.11	6.4.11	SIMalliance APIs - Method: Channel openLogicalChannel (with P2) – Extended logical channels	ID1 – ID3	8.0 onwards
6.3.1.6.5.1	6.5.1	SIMalliance APIs - Method: void close()	ID1, ID3 – ID6	6.0 onwards
6.3.1.6.5.2	6.5.2	SIMalliance APIs - Method: boolean isBasicChannel()	ID2	6.0 onwards
6.3.1.6.5.3	6.5.3	SIMalliance APIs - Method: boolean isClosed()	ID1, ID2	6.0 onwards
6.3.1.6.5.4	6.5.4	SIMalliance APIs - Method: byte[] getSelectResponse()	ID1, ID2, ID4 – ID12	6.0 onwards
6.3.1.6.5.5	6.5.5	SIMalliance APIs - Method: Session getSession()	ID1	6.0 onwards
6.3.1.6.5.6	6.5.6	SIMalliance APIs - Method: byte[] transmit(byte[] command)	ID2 – ID21, ID23 – ID29	6.0 onwards
6.3.1.6.5.7	6.5.7	SIMalliance APIs - Method: Boolean[] selectNext()	ID1 – ID5, ID7 – ID9	6.0 onwards

Table 15: SIMalliance test case

B.2 EMVCo

The GSMA requires device manufacturer to pass the EMVCo Level 1 testing according to EMVCo test plan in the scope of a device evaluation. This applies for Analog, Digital [38], Performance and Interoperability testing [39].

Completion of EMVCo testing is not considered a pre-requisite for a device vendor to start testing for all test cases in defined in the GSMA TS.27 NFC Handset Test Book. A device

vendor may have all test cases defined in the GSMA TS.27 NFC Handset Test Book conducted before testing with EMVCo or in parallel with testing with EMVCo.

B.3 VOID

B.4 ETSI TS 102 613 SWP

Reference test Specification: ETSI TS 102 694-1 [11]

ETSI TS 102 694-1 [11] specifies a number of optional features for the device. The following table lists which optional features from ETSI TS 102 694-1 [11] are mandatory (M) or recommended (R) according to GSMA requirements:

Item	Option	Mnemonic	GSMA Status
1	Class B	O_CLASS_B	R
2	Class C full power mode	O_CLASS_C_FULL	M
3	Class C low power mode	O_CLASS_C_LOW	C001
6	Terminal supports DEACTIVATED followed by subsequent SWP interface activation in full power mode	O_DEAC_SUBACT_FULL	M
7	Window size of 3	O_WS_3	R
8	Window size of 4	O_WS_4	R
9	HCI as per ETSI TS 102 622 [10]	O_102_622	M
10	CLT, ISO/IEC 14443-3 Type A	O_CLT_A	M
11	CLT, ISO/IEC 18092 [28] Note this mandatory requirement will become effective from the 1st August 2015.	O_CLT_F	R Up to 31st July 2015 M – from 1st August 2015
18	Card Emulation, ISO/IEC 14443-4 type A	O_CE_A	M
19	Card Emulation, ISO/IEC 14443-4 type B	O_CE_B	M
C001: IF O_BAT_OFF THEN M ELSE O Note: The option “Class C low power mode” is related to the option O_BAT_OFF as defined within TS.27 Section 2.1.4. The test cases which are conditional for “Class C low power mode” will be performed according to condition C001 as defined above.			

The following test cases are applicable:

1) Test cases verified by GCF WI 133 are listed in the Table below. These test cases are validated by GCF.

Index	TC Title
5.3.2.2.2	Test case 1: activation of SWP additionally to other interfaces
5.3.2.2.3	Test case 2: activation of SWP in low power mode
5.3.2.3.2	Test case 1: SWP initial activation in full power mode – normal procedure
5.3.2.3.4	Test case 3: SWP initial activation in full power mode – corrupted ACT_SYNC frame (repeat the last frame)
5.3.2.3.5	Test case 4: SWP initial activation in full power mode – no ACT_SYNC frame (repeat the last frame)
5.3.2.3.7	Test case 6: SWP initial activation failed in full power mode – no ACT_SYNC frame (multiple)
5.3.2.3.9	Test case 8: SWP Initial activation in full power mode – no ACT_READY frame (repeat last frame)
5.3.2.3.10	Test case 9: SWP initial activation failed in full power mode – corrupted ACT_READY frame (multiple)
5.3.2.3.12	Test case 11: SWP initial activation in low power mode
5.3.2.3.13	Test case 12:SWP initial activation in low power mode – corrupted ACT_SYNC frame (repeat the last frame)
5.3.2.3.14	Test case 13: SWP initial activation in low power mode – no ACT_SYNC frame (repeat the last frame)
5.3.2.3.15	Test case 14: SWP initial activation failed in low power mode – corrupted ACT_SYNC frame (multiple)
5.3.2.3.16	Test case 15: SWP initial activation failed in low power mode – no ACT_SYNC frame (multiple)
5.3.2.3.17	Test case 16: SWP subsequent activation in full power mode
5.4.1.3.2	Test case 1: current provided in low power mode, no spikes
5.4.1.3.3	Test case 2: current provided in low power mode, with spikes
5.4.1.4.2	Test case 1: communication with S2 variation in full power mode
5.4.1.4.3	Test case 2: communication with S2 variation in low power mode
5.4.1.5.2.2	Test case 1: communication with S2 variation in full power mode
5.4.1.5.2.3	Test case 2: communication with S2 variation in low power mode
5.5.1.2	Test case 1: S1 waveforms, default bit duration
5.5.1.3	Test case 2: S1 waveforms, extended bit durations
5.5.3.2	Test case 1: SWP states and transitions, communication
5.5.4.2	Test case 1: power provided in full power mode
5.5.4.3	Test case 2: switching from full to low power mode

Index	TC Title
5.5.4.4	Test case 3: switching from low to full power mode
5.6.2.2.2	Test case 1: interpretation of incorrectly formed frames – SHDLC RSET frames
5.6.2.2.3	Test case 2: interpretation of incorrectly formed frames – SHDLC I-frames
5.6.2.3.2	Test case 1: behaviour of CLF with bit stuffing in frame
5.6.3.2.2	Test case 1: ignore ACT LLC frame reception after the SHDLC link establishment
5.6.3.2.3	Test case 2: ignore ACT LLC frame reception in CLT session
5.6.3.2.5	Test case 4: closing condition of CLT session whereas SHDLC link has been established before CLT session
5.6.4.2.2	Test case 1: not matching SYNC_ID verification in low power mode
5.7.1.2	Test Case 1: data passed up to the next layer
5.7.1.3	Test Case 2: error management – corrupted I-frame
5.7.1.4	Test Case 3: error management – corrupted RR frame
5.7.6.4.2	Test case 1: initial state at link reset – reset by the UICC
5.7.7.3.2	Test Case 1: link establishment by the UICC
5.7.7.3.3	Test case 2: Link establishment and connection time out
5.7.7.3.4	Test case 3: requesting unsupported window size and/or SREJ support - link establishment by UICC
5.7.7.3.5	Test case 4: forcing lower window size and SREJ not used – link establishment by the T
5.7.7.5.2	Test case 1: I-frame transmission
5.7.7.5.3	Test case 2: I-frame reception - single I-Frame reception
5.7.7.5.4	Test case 3: I-frame reception - multiple I-Frame reception
5.7.7.6.2	Test case 1: REJ transmission – multiple I-frames received
5.7.7.6.3	Test case 2: REJ reception
5.7.7.7.2	Test case 1: retransmission of multiple frames
5.7.7.8.2	Test case 1: RNR reception
5.8.5.2	Test case 1: ISO/IEC14443-3 Type A, no administrative command
5.8.6.3.1.2	Test case 1: opening a CLT session with CL_PROTO_INF(A)
5.9.2.1.2	Test case 1: CLF processing time - Type A aligned communication, with RF response
5.9.2.1.3	Test case 2: CLF processing time, no RF response
5.9.2.2.2	Test case 1: CLF processing time, Request Guard Time - Type A state transition
5.9.2.2.3	Test case 2: CLF processing time, Request Guard Time from HALT state- Type

Index	TC Title
	A state transition

Table 16: List of applicable test cases from GCF WI 133

2) Test cases verified by GCF WI 190 [26] are listed in Table 16. These test cases are validated by GCF.

Index	TC Title
5.3.2.3.6	Test case 5: SWP initial activation failed in full power mode – corrupted ACT_SYNC frame (multiple)
5.3.2.3.8	Test case 7: SWP Initial activation in full power mode – corrupted ACT_READY frame (repeat last frame)
5.3.2.3.11	Test case 10: SWP initial activation failed in full power mode – no ACT_READY frame (multiple)
5.3.2.3.19	Test case 18: SWP initial activation in full power mode – send ACT frames in wrong order, ACT_READY frame after activation (repeat the last frame)
5.5.3.3	SWP resume after upper layer indication that the UICC requires no more activity on this interface
5.7.7.8.3	Test case 2: Empty I-frame transmission
5.8.6.3.2.2	Opening a CLT session with CL_PROTO_INF(F)
5.8.6.3.2.3	Empty CLT(F) Frame
5.8.6.3.2.4	RF off during CLT session not expecting Empty CLT
5.8.6.3.2.5	RF off during CLT session expecting Empty CLT
5.9.1.2.2	Transceiving non-chained data over RF in Card Emulation

Table 17: List of additional test cases

B.5 ETSI TS 102 622 [10] HCI

Reference test Specification: ETSI TS 102 695-1

ETSI TS 102 695-1 specifies a number of optional features for the device. The following table lists which optional features from ETSI TS 102 695-1 are mandatory (M) or recommended (R) according to GSMA requirements:

Item	Option	Mnemonic	GSMA Status
1	Data link layer specified in TS 102 613 is used	O_102_613	M
2	Card RF gate for technology A is supported	O_CE_TypeA	M
3	Card RF gate for technology B is supported	O_CE_TypeB	M

Item	Option	Mnemonic	GSMA Status
4	Reader RF gate for technology A is supported	O_Reader_TypeA	M
5	Reader RF gate for technology B is supported	O_Reader_TypeB	M
6	Card RF gate for technology F is supported	O_CE_TypeF	R
7	Low power mode is supported	O_Low_Power_Mode	C001
8	Item 2 and item 3 are supported.	O_CE_TypeA AND O_CE_TypeB	M
9	Item 6 and either item 2 or item 3 is supported	(O_CE_TypeA OR O_CE_TypeB) AND O_CE_TypeF	R
10	CLT for Type A as specified in ETSI TS 102 613 [9] is supported.	O_CE_CLT_TypeA	M
11	Item 10 and item 3 are supported.	O_CE_CLT_TypeA AND O_CE_TypeB	M
12	Connectivity gate is supported in the terminal host	O_Conn	M
C001: IF O_BAT_OFF THEN M ELSE O			

The following test cases shall be verified:

1) Test cases verified by GCF WI 133 are listed in Table 17. These test cases are validated by GCF.

   All the test cases listed by work item 133 shall be run.

Index	TC Title
5.1.3.2	TC 1: existence of gates
5.1.4.2	TC 1: static pipe deletion
5.1.4.3	TC 2: initial pipe state and persistence of pipe state and registry value
5.1.5.2	TC 1: registry deletion
5.2.2.2	TC 1: commands/events on pipe which is not open
5.3.1.2.3.2	TC 1: ANY_OPEN_PIPE reception
5.3.1.2.4.2	TC 1: ANY_CLOSE_PIPE reception
5.3.2.2	TC 1: response to unknown command
5.3.3.2	TC 1: reception of unknown events
5.4.2.1.1.2	TC 1: SESSION_IDENTITY
5.4.2.1.1.3	TC 2: MAX_PIPE

Index	TC Title
5.4.2.1.1.4	TC 3: WHITELIST
5.4.2.1.1.5	TC 4: HOST_LIST
5.4.2.3.1.2	TC 1: registry parameters
5.5.1.2.2	TC 1: valid pipe deletion from host to host controller
5.5.1.3.2	TC 1: identity reference data when TS 102 613 is used
5.5.1.3.3	TC 2: reception of ADM_CLEAR_ALL_PIPE – static pipes, dynamic pipes to host
5.5.4.2	TC 1: inhibited state
5.5.4.3	TC 2: inhibited state, followed by subsequent successful identity check
5.5.5.2	TC 1: processing of EVT_POST_DATA
5.6.1.2	TC 1: RF gate of type A
5.6.1.3	TC 2: RF gate of type B
5.6.3.3.4.2.2	TC 1: UID_REG - default
5.6.3.3.4.2.3	TC 2: SAK
5.6.3.3.4.2.4	TC 3: ATS – default parameters
5.6.3.3.4.2.5	TC 4: APPLICATION_DATA
5.6.3.3.4.2.6	TC 5: DATARATE_MAX
5.6.3.3.4.3.2	TC 1: PUPI_REG – default
5.6.3.3.4.3.3	TC 2: ATQB – verify the different parameter
5.6.3.3.4.3.4	TC 3: HIGHER_LAYER_RESPONSE
5.6.4.1.2	TC 1: ISO/IEC14443-3 Type A – Full Power Mode
5.6.4.1.3	TC 2: ISO/IEC14443-3 Type B

Table 18: List of applicable test cases from GCF WI 133

2) Test cases verified by GCF WI 190 [26] are listed in Table 18. These test cases are validated by GCF.

Index	TC Title
5.6.1.4	Test case x: RF gate of type F
5.6.4.1.4	Test case 3: Routing EVT_FIELD_ON and EVT_FIELD_OFF to RF Gate with lowest GID
5.6.4.2.2	Test case 1: None ISO/IEC 14443-4 type A
5.6.4.2.3	Test case 2: Routing EVT_FIELD_ON and EVT_FIELD_OFF to RF Gate with lowest GID
5.6.4.4.2	Test case 1: ISO/IEC 18092 Type F

Index	TC Title
5.6.4.4.3	Test case y: RF off during ISO/IEC 18092 [28] Type F commands handling
5.6.4.4.4	Test case 3: Routing EVT_FIELD_ON and EVT_FIELD_OFF to RF Gate with lowest GID
5.7.2.3.1.2	Test case 1: ISO/IEC 14443-4 compliant type A

Table 19: List of additional test cases

B.6 ETSI TS 102.384 [13], 3GPP 31.124

Reference test Specification: ETSI TS 102 384 [13] and 3GPP TS 31.124 v10.0.0

The test cases in Table 19 are applicable to verify TS26_NFC_REQ_078 as following:

1) Applicable test cases verified by GCF WI 035 are listed in Table 19. These test cases are validated by GCF.

Ref Spec	Index	TC Title	Sequence Name
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, no local address, no alpha identifier, no network access name
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment GPRS, no alpha identifier, with network access name
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, with alpha identifier
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, with null alpha identifier
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, command performed with modifications (buffer size)
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, open command with alpha identifier, User did not accept the proactive command

Ref Spec	Index	TC Title	Sequence Name
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, GPRS, open command with alpha identifier, User did not accept the proactive command
3GPP TS 31.124	27.22.4.28.1	CLOSE CHANNEL(normal)	CLOSE CHANNEL, successful
3GPP TS 31.124	27.22.4.28.1	CLOSE CHANNEL(normal)	CLOSE CHANNEL, with an invalid channel identifier
3GPP TS 31.124	27.22.4.28.1	CLOSE CHANNEL(normal)	CLOSE CHANNEL, on an already closed channel
3GPP TS 31.124	27.22.4.29.1	RECEIVE DATA (NORMAL)	RECEIVE DATA, already opened channel, GPRS
3GPP TS 31.124	27.22.4.30.1	SEND DATA (normal)	SEND DATA, immediate mode, GPRS
3GPP TS 31.124	27.22.4.30.1	SEND DATA (normal)	SEND DATA, Store mode, GPRS
3GPP TS 31.124	27.22.4.30.1	SEND DATA (normal)	SEND DATA, Store mode, Tx buffer fully used, GPRS
3GPP TS 31.124	27.22.4.30.1	SEND DATA (normal)	SEND DATA, 2 consecutive SEND DATA Store mode, GPRS
3GPP TS 31.124	27.22.4.30.1	SEND DATA (normal)	SEND DATA, immediate mode with a bad channel identifier, GPRS
3GPP TS 31.124	27.22.4.31	GET CHANNEL STATUS	GET STATUS, with a BIP channel currently opened, GPRS
3GPP TS 31.124	27.22.4.31	GET CHANNEL STATUS	GET STATUS, after a link dropped, GPRS
3GPP TS 31.124	27.22.7.10	Data available event	EVENT DOWNLOAD – Data available, GPRS
3GPP TS 31.124	27.22.7.11	Channel Status event	EVENT DOWNLOAD – Channel Status on a link dropped

Table 20: List of applicable test cases from GCF WI – 035 [15]

The applicable test cases to verify TS26_NFC_REQ_079

1) The applicable test case from 3GPP TS 31.124 is listed in Table 20.

Ref Spec	Index	TC Title	Sequence Name
3GPP TS 31.124	27.22.4.27.2	Open Channel (related to GPRS)	OPEN CHANNEL, immediate link establishment, no alpha identifier, with network access name

Table 21: applicable test cases from GCF WI 035

The test cases are applicable to verify TS26_NFC_REQ_081 as following:

2) The test case verified by GCF WI 035 listed in Table 21

Ref Spec	Index	TC Title	Sequence name
3GPP TS 31.124	27.22.5.1	SMS-PP Data Download	Seq 1.9: SMS-PP Data Download over CS/PS, UTRAN/GERAN

Table 22: Applicable test cases

The test cases are applicable to verify ***Annex B*** as following:

1) The test case verified by GCF WI 035 listed in Table 22

Ref Spec	Index	TC Title	Sequence name
3GPP TS 31.124	27.22.4.26.1	LAUNCH BROWSER (No session already launched)	LAUNCH BROWSER, connect to the default URL
3GPP TS 31.124	27.22.4.26.1	LAUNCH BROWSER (No session already launched)	LAUNCH BROWSER, connect to the specified URL, alpha identifier length=0
3GPP TS 31.124	27.22.4.26.1	LAUNCH BROWSER (No session already launched)	LAUNCH BROWSER, Browser identity, no alpha identifier
3GPP TS 31.124	27.22.4.26.1	LAUNCH BROWSER (No session already launched)	LAUNCH BROWSER, one bearer specified and gateway/proxy identity
3GPP TS 31.124	27.22.4.26.2	LAUNCH BROWSER (Interaction with current session)	LAUNCH BROWSER, use the existing browser, connect to the default URL
3GPP TS 31.124	27.22.4.26.2	LAUNCH BROWSER (Interaction with current session)	LAUNCH BROWSER, close the existing browser session and launch new browser session, connect to the default URL

Ref Spec	Index	TC Title	Sequence name
3GPP TS 31.124	27.22.4.26.2	LAUNCH BROWSER (Interaction with current session)	LAUNCH BROWSER, if not already launched
3GPP TS 31.124	27.22.7.9.1	Browser termination (normal)	EVENT DOWNLOAD - Browser termination

Table 23: Applicable test cases

The test cases in Table 23 are applicable to verify Annex B

Ref Spec	Index	TC Title	Sequence name
ETSI TS 102 384	27.22.7.18	HCI connectivity event	HCI connectivity event (normal)
ETSI TS 102 384	27.22.4.32	ACTIVATE	ACTIVATE

Table 24: List of additional test cases

B.7 Void

B.8 GP Secure Element Access Control

Reference test Specification: The test book refers to “GlobalPlatform - SEAC DeviceSide Test Plan v1.0.6” specification.

The following table indicates which test cases are included in the current version of the Test Book :

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.1.1	ACE_DETECT_CORRUPTED_RULES_IN_ARF	1	ACCESS_DENIED_CORRUPTED_ARF_ERROR_00_No_EF_DIR (0b-1c-c7)	No
5.4.1.2		2	ACCESS_DENIED_CORRUPTED_ARF_ERROR_01_No_PKCS15_Referenced_in_EF_DIR (0b-20-bd)	No
5.4.1.3		3	ACCESS_DENIED_CORRUPTED_ARF_ERROR_02_ODF_Bad_Padding (0b-8a-03)	Yes
5.4.1.4		4	ACCESS_DENIED_CORRUPTED_ARF_ERROR_03_DODF_Without_OID (0b-5b-03)	Yes
5.4.1.5		5	ACCESS_DENIED_CORRUPTED_ARF_ERROR_04_DODF_With_BadLength_BadOffset (0b-86-a3)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.1.6		6	ACCESS_DENIED_CORRUPTED_ARF_ERROR_05_ACMF_Not_Found (0b-81-11)	Yes
5.4.1.7		7	ACCESS_DENIED_CORRUPTED_ARF_ERROR_06_ACMF_Zero_Length (0b-d1-10)	No
5.4.1.8		8	ACCESS_DENIED_CORRUPTED_ARF_ERROR_07_ACMF_Bad_Padding (0b-df-cf)	No
5.4.1.9		9	ACCESS_DENIED_CORRUPTED_ARF_ERROR_08_ACRF_Not_Found (0b-d2-a1)	Yes
5.4.1.10		10	ACCESS_DENIED_CORRUPTED_ARF_ERROR_09_ACRF_Zero_Length (0b-15-c1)	Yes
5.4.1.11		11	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0A_ACRF_Bad_Padding (0b-19-6f)	No
5.4.1.12		12	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0B_ACRF_Without_Any_Rule (0b-dc-4f)	Yes
5.4.1.13		13	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0C_ACCF_Not_Found (0b-ff-4d)	Yes
5.4.1.14		14	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0D_ACCF_Zero_Length (0b-fb-57)	Yes
5.4.1.15		15	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0E_ACCF_Bad_Padding (0b-f8-05)	No
5.4.1.16		16	ACCESS_DENIED_CORRUPTED_ARF_ERROR_0F_ACCF_Wrong_Certificate_Length (0b-9c-9a)	Yes
5.4.2.1	ACE_DETECT_CORRUPTED_RULES	1	ACCESS_DENIED_ERROR_APDU_AR_DO_Bad_Length (c0-c4-e9)	Yes
5.4.2.2		2	ACCESS_DENIED_ERROR_APDU_AR_DO_Bad_value (c0-62-b5)	Yes
5.4.2.3		3	ACCESS_DENIED_ERROR_NFC_AR_DO_Bad_Length (c0-90-88)	Yes
5.4.2.4		4	ACCESS_DENIED_ERROR_NFC_AR_DO_Bad_Value (c0-d7-66)	Yes
5.4.3.1	ACCESS_DENIED	1	ACCESS_DENIED_SUCCESS__ARA_M_locked (c0-36-1d)	Yes
5.4.3.2		2	ACCESS_DENIED_SUCCESS__ARA_M_not_present (c0-36-1e)	Yes
5.4.3.3		3	ACCESS_DENIED_SUCCESS__ARA_M_not_selectable (c0-f6-26)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.4.1	ALGORITHM_SPECIFIC_DEVICE_APP_AND_SPECIFIC_SE_APP	1	ALGORITHM_A_SUCCESS__R1_SEApp1_DevApp1__R2_All_All__request_DevApp2_SEApp1 (c0-ee-09)	Yes
5.4.4.2		2	ALGORITHM_A_SUCCESS__R1_SEApp1_DevApp1__R2_All_All__request_DevApp2_SEApp1 (ff-ee-09)	Yes
5.4.5.1	ALGORITHM_SPECIFIC_DEVICE_APP_AND_GENERIC_SE_APP	1	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1__R2_All_All__request_DevApp2_SEApp1 (c0-d4-fb)	Yes
5.4.5.2		2	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1__R2_All_All__request_DevApp2_SEApp1 (ff-d4-fb)	Yes
5.4.5.3		3	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1_ALWAYS__R2_All_SEApp_DevApp2_NEVER (c0-40-30)	Yes
5.4.5.4		4	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1_ALWAYS__R2_All_SEApp_DevApp2_NEVER (ff-40-30)	Yes
5.4.5.5		5	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1_NEVER__R2_All_SEApp_DevApp2_ALWAYS (c0-80-26)	Yes
5.4.5.6		6	ALGORITHM_C_SUCCESS__R1_All_SEApp_DevApp1_NEVER__R2_All_SEApp_DevApp2_ALWAYS (ff-80-26)	Yes
5.4.6.1	ALGORITHM_GENERIC_DEVICE_APP_AND_GENERIC_SE_APP	1	ALGORITHM_D_SUCCESS__All_SEApp_All_DevApp_APDU_access_ALWAYS (c0-2e-b0)	Yes
5.4.6.2		2	ALGORITHM_D_SUCCESS__All_SEApp_All_DevApp_APDU_access_ALWAYS (ff-2e-b0)	Yes
5.4.6.3		3	ALGORITHM_D_SUCCESS__No_Rule (c0-cf-16)	Yes
5.4.6.4		4	ALGORITHM_D_SUCCESS__No_Rule (ff-cf-16)	Yes
5.4.7.1	ANNEX_D_EXAMPLE_01	1	ANNEX_D_SUCCESS__example_01 (c0-38-cb)	Yes
5.4.7.2		2	ANNEX_D_SUCCESS__example_01 (ff-38-cb)	Yes
5.4.8.1	ANNEX_D_EXAMPLE_02	1	ANNEX_D_SUCCESS__example_02 (c0-a1-46)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.8.2		2	ANNEX_D_SUCCESS__example_02 (ff-a1-46)	Yes
5.4.9.1	ANNEX_D_EXAMPLE_03	1	ANNEX_D_SUCCESS__example_03 (c0-39-49)	Yes
5.4.9.2		2	ANNEX_D_SUCCESS__example_03 (ff-39-49)	Yes
5.4.10.1	ANNEX_D_EXAMPLE_04	1	ANNEX_D_SUCCESS__example_04 (c0-2f-62)	Yes
5.4.10.2		2	ANNEX_D_SUCCESS__example_04 (ff-2f-62)	Yes
5.4.11.1	ANNEX_D_EXAMPLE_05	1	ANNEX_D_SUCCESS__example_05 (c0-d2-97)	Yes
5.4.11.2		2	ANNEX_D_SUCCESS__example_05 (ff-d2-97)	Yes
5.4.12.1	ANNEX_D_EXAMPLE_06	1	ANNEX_D_SUCCESS__example_06 (c0-51-08)	Yes
5.4.12.2		2	ANNEX_D_SUCCESS__example_06 (ff-51-08)	Yes
5.4.13.1	ANNEX_D_EXAMPLE_07	1	ANNEX_D_SUCCESS__example_07 (c0-e0-83)	Yes
5.4.13.2		2	ANNEX_D_SUCCESS__example_07 (ff-e0-83)	Yes
5.4.14.1	ANNEX_D_EXAMPLE_09	1	ANNEX_D_SUCCESS__example_09 (c0-4c-cb)	Yes
5.4.14.2		2	ANNEX_D_SUCCESS__example_09 (ff-4c-cb)	Yes
5.4.15.1	ANNEX_D_EXAMPLE_10	1	ANNEX_D_SUCCESS__example_10 (c0-ad-7d)	Yes
5.4.15.2		2	ANNEX_D_SUCCESS__example_10 (ff-ad-7d)	Yes
5.4.16.1	ANNEX_D_EXAMPLE_11	1	ANNEX_D_SUCCESS__example_11 (c0-f4-52)	Yes
5.4.16.2		2	ANNEX_D_SUCCESS__example_11 (ff-f4-52)	Yes
5.4.17.1	ANNEX_D_EXAMPLE_12	1	ANNEX_D_SUCCESS__example_12 (c0-24-84)	Yes
5.4.17.2		2	ANNEX_D_SUCCESS__example_12 (ff-24-84)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.18.1	ANNEX_D_EXAMPLE_13	1	ANNEX_D_SUCCESS__example_13 (c0-29-86)	Yes
5.4.18.2		2	ANNEX_D_SUCCESS__example_13 (ff-29-86)	Yes
5.4.19.1	ANNEX_D_EXAMPLE_14	1	ANNEX_D_SUCCESS__example_14 (c0-72-b7)	Yes
5.4.19.2		2	ANNEX_D_SUCCESS__example_14 (ff-72-b7)	Yes
5.4.20.1	ANNEX_D_EXAMPLE_15	1	ANNEX_D_SUCCESS__example_15 (c0-db-cb)	Yes
5.4.20.2		2	ANNEX_D_SUCCESS__example_15 (ff-db-cb)	Yes
5.4.21.1	ANNEX_D_EXAMPLE_16	1	ANNEX_D_SUCCESS__example_16 (c0-cf-17)	Yes
5.4.21.2		2	ANNEX_D_SUCCESS__example_16 (ff-cf-17)	Yes
5.4.22.1	ANNEX_D_EXAMPLE_17	1	ANNEX_D_SUCCESS__example_17 (c0-0b-29)	Yes
5.4.22.2		2	ANNEX_D_SUCCESS__example_17 (ff-0b-29)	Yes
5.4.23.1	ANNEX_D_EXAMPLE_18	1	ANNEX_D_SUCCESS__example_18 (c0-71-16)	Yes
5.4.23.2		2	ANNEX_D_SUCCESS__example_18 (ff-71-16)	Yes
5.4.24.1	APDU_FILTER_DEFINITION	1	APDU_FILTER_DEFINITION_SUCCESS__ALWAYS__true (c0-01-e8)	Yes
5.4.24.2		2	APDU_FILTER_DEFINITION_SUCCESS__ALWAYS__true (ff-01-e8)	Yes
5.4.24.3		3	APDU_FILTER_DEFINITION_SUCCESS__FILTER__1_filter__true (c0-dc-08)	Yes
5.4.24.4		4	APDU_FILTER_DEFINITION_SUCCESS__FILTER__1_filter__true (ff-dc-08)	Yes
5.4.24.5		5	APDU_FILTER_DEFINITION_SUCCESS__FILTER__2_filters__true (c0-6c-24)	Yes
5.4.24.6		6	APDU_FILTER_DEFINITION_SUCCESS__FILTER__2_filters__true (ff-6c-24)	Yes
5.4.24.7		7	APDU_FILTER_DEFINITION_SUCCESS__FILTER__3_filters__true (c0-44-7d)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.24.8		8	APDU_FILTER_DEFINITION_SUCCESS__FILTER__3_filters__true (ff-44-7d)	Yes
5.4.24.9		9	APDU_FILTER_DEFINITION_SUCCESS__NEVER__false (c0-82-ed)	Yes
5.4.24.10		10	APDU_FILTER_DEFINITION_SUCCESS__NEVER__false (ff-82-ed)	Yes
5.4.25.1	ACE_MANAGE_BIG_RULES	1	BIG_RULES_MANAGEMENT_One_Big_Rule (c0-64-2b)	Yes
5.4.25.2		2	BIG_RULES_MANAGEMENT_One_Big_Rule (ff-64-2b)	Yes
5.4.26.1	RULE_CONFLICT_RESOLUTION_MORE_RESTRICTIVE	1	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (c0-68-d7)	Yes
5.4.26.2		2	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (ff-68-d7)	Yes
5.4.26.3		3	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (c0-fb-a4)	Yes
5.4.26.4		4	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (ff-fb-a4)	Yes
5.4.26.5		5	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (c0-87-cd)	Yes
5.4.26.6		6	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (ff-87-cd)	Yes
5.4.26.7		7	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (c0-d7-15)	Yes
5.4.26.8		8	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (ff-d7-15)	Yes
5.4.26.9		9	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (c0-c9-58)	Yes
5.4.26.10		10	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (ff-c9-58)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.26.11		11	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (c0-2d-54)	Yes
5.4.26.12		12	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (ff-2d-54)	Yes
5.4.26.13		13	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (c0-e1-ed)	Yes
5.4.26.14		14	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (ff-e1-ed)	Yes
5.4.26.15		15	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (c0-9b-af)	Yes
5.4.26.16		16	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (ff-9b-af)	Yes
5.4.26.17		17	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_always (c0-73-51)	Yes
5.4.26.18		18	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_always (ff-73-51)	Yes
5.4.26.19		19	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_never (c0-42-e5)	Yes
5.4.26.20		20	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_always__R2_apdu_never (ff-42-e5)	Yes
5.4.26.21		21	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_filter (c0-55-e2)	Yes
5.4.26.22		22	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_filter (ff-55-e2)	Yes
5.4.26.23		23	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_never (c0-78-2b)	Yes

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5.4.26.24		24	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_never (ff-78-2b)	Yes
5.4.26.25		25	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_always (c0-b4-23)	Yes
5.4.26.26		26	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_always (ff-b4-23)	Yes
5.4.26.27		27	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_filter (c0-21-c2)	Yes
5.4.26.28		28	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_filter (ff-21-c2)	Yes
5.4.26.29		29	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_never (c0-e1-e4)	Yes
5.4.26.30		30	CONFLICT_SUCCESS__1_SEApp_1_DevApp__R1_apdu_never__R2_apdu_never (ff-e1-e4)	Yes
5.4.26.31		31	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (c0-58-e2)	Yes
5.4.26.32		32	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (ff-58-e2)	Yes
5.4.26.33		33	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (c0-0c-1d)	Yes
5.4.26.34		34	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (ff-0c-1d)	Yes
5.4.26.35		35	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (c0-c4-0e)	Yes
5.4.26.36		36	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (ff-c4-0e)	Yes

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5.4.26.37		37	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (c0-29-e9)	Yes
5.4.26.38		38	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (ff-29-e9)	Yes
5.4.26.39		39	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (c0-c8-fb)	Yes
5.4.26.40		40	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (ff-c8-fb)	Yes
5.4.26.41		41	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (c0-49-26)	Yes
5.4.26.42		42	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (ff-49-26)	Yes
5.4.26.43		43	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (c0-00-3a)	Yes
5.4.26.44		44	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (ff-00-3a)	Yes
5.4.26.45		45	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (c0-c2-82)	Yes
5.4.26.46		46	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (ff-c2-82)	Yes
5.4.26.47		47	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_always (c0-41-a5)	Yes
5.4.26.48		48	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_always (ff-41-a5)	Yes
5.4.26.49		49	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_never (c0-16-b9)	Yes

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5.4.26.50		50	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_always__R2_apdu_never (ff-16-b9)	Yes
5.4.26.51		51	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_filter (c0-03-40)	Yes
5.4.26.52		52	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_filter (ff-03-40)	Yes
5.4.26.53		53	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_never (c0-d7-89)	Yes
5.4.26.54		54	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_never (ff-d7-89)	Yes
5.4.26.55		55	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_always (c0-2d-17)	Yes
5.4.26.56		56	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_always (ff-2d-17)	Yes
5.4.26.57		57	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_filter (c0-50-39)	Yes
5.4.26.58		58	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_filter (ff-50-39)	Yes
5.4.26.59		59	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_never (c0-29-95)	Yes
5.4.26.60		60	CONFLICT_SUCCESS__1_SEApp_All_DevApp__R1_apdu_never__R2_apdu_never (ff-29-95)	Yes
5.4.26.61		61	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (c0-9c-1e)	Yes
5.4.26.62		62	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (ff-9c-1e)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.26.63		63	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (c0-91-2e)	Yes
5.4.26.64		64	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (ff-91-2e)	Yes
5.4.26.65		65	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (c0-e8-cf)	Yes
5.4.26.66		66	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (ff-e8-cf)	Yes
5.4.26.67		67	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (c0-b3-b0)	Yes
5.4.26.68		68	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (ff-b3-b0)	Yes
5.4.26.69		69	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (c0-dd-11)	Yes
5.4.26.70		70	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (ff-dd-11)	Yes
5.4.26.71		71	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (c0-28-6e)	Yes
5.4.26.72		72	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (ff-28-6e)	Yes
5.4.26.73		73	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (c0-73-cf)	Yes
5.4.26.74		74	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (ff-73-cf)	Yes
5.4.26.75		75	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (c0-db-29)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.26.76		76	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (ff-db-29)	Yes
5.4.26.77		77	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_always (c0-3c-2b)	Yes
5.4.26.78		78	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_always (ff-3c-2b)	Yes
5.4.26.79		79	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_never (c0-99-f5)	Yes
5.4.26.80		80	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_always__R2_apdu_never (ff-99-f5)	Yes
5.4.26.81		81	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_filter (c0-81-35)	Yes
5.4.26.82		82	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_filter (ff-81-35)	Yes
5.4.26.83		83	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_never (c0-5c-7f)	Yes
5.4.26.84		84	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_filter__R2_apdu_never (ff-5c-7f)	Yes
5.4.26.85		85	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_always (c0-f2-08)	Yes
5.4.26.86		86	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_always (ff-f2-08)	Yes
5.4.26.87		87	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_filter (c0-bf-dc)	Yes
5.4.26.88		88	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_filter (ff-bf-dc)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.26.89		89	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_never___false (c0-7a-bc)	Yes
5.4.26.90		90	CONFLICT_SUCCESS__All_SEApp_1_DevApp__R1_apdu_never__R2_apdu_never___false (ff-7a-bc)	Yes
5.4.26.91		91	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (c0-b0-96)	Yes
5.4.26.92		92	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_0_match__R2_apdu_always (ff-b0-96)	Yes
5.4.26.93		93	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (c0-52-54)	Yes
5.4.26.94		94	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_1_match__R2_apdu_always (ff-52-54)	Yes
5.4.26.95		95	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (c0-70-6c)	Yes
5.4.26.96		96	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_1_filter_2_match__R2_apdu_always (ff-70-6c)	Yes
5.4.26.97		97	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (c0-58-13)	Yes
5.4.26.98		98	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_2_filters_1_match_each__R2_apdu_always (ff-58-13)	Yes
5.4.26.99		99	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (c0-4b-98)	Yes
5.4.26.100		100	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_0_match (ff-4b-98)	Yes
5.4.26.101		101	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (c0-38-d9)	Yes

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5.4.26.102		102	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_1_match (ff-38-d9)	Yes
5.4.26.103		103	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (c0-85-6b)	Yes
5.4.26.104		104	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_1_filter_2_match (ff-85-6b)	Yes
5.4.26.105		105	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (c0-3c-9f)	Yes
5.4.26.106		106	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_2_filters_1_match_each (ff-3c-9f)	Yes
5.4.26.107		107	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_always (c0-06-0b)	Yes
5.4.26.108		108	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_always (ff-06-0b)	Yes
5.4.26.109		109	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_never (c0-c8-59)	Yes
5.4.26.110		110	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_always__R2_apdu_never (ff-c8-59)	Yes
5.4.26.111		111	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_filter (c0-76-bc)	Yes
5.4.26.112		112	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_filter (ff-76-bc)	Yes
5.4.26.113		113	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_never (c0-b0-d6)	Yes
5.4.26.114		114	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_filter__R2_apdu_never (ff-b0-d6)	Yes

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5.4.26.115		115	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_always (c0-09-ca)	Yes
5.4.26.116		116	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_always (ff-09-ca)	Yes
5.4.26.117		117	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_filter (c0-b1-4f)	Yes
5.4.26.118		118	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_filter (ff-b1-4f)	Yes
5.4.26.119		119	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_never (c0-74-d7)	Yes
5.4.26.120		120	CONFLICT_SUCCESS__All_SEApp_All_DevApp__R1_apdu_never__R2_apdu_never (ff-74-d7)	Yes
5.4.26.121		121	CONFLICT_SUCCESS__R1_1_SEApp_1_DevApp_ALWAYS__R2_All_SEApp_1_DevApp_NEVER (c0-61-bf)	Yes
5.4.26.122		122	CONFLICT_SUCCESS__R1_1_SEApp_1_DevApp_ALWAYS__R2_All_SEApp_1_DevApp_NEVER (ff-61-bf)	Yes
5.4.26.123		123	CONFLICT_SUCCESS__R1_1_SEApp_1_DevApp_NEVER__R2_All_SEApp_1_DevApp_ALWAYS (c0-38-79)	Yes
5.4.26.124		124	CONFLICT_SUCCESS__R1_1_SEApp_1_DevApp_NEVER__R2_All_SEApp_1_DevApp_ALWAYS (ff-38-79)	Yes
5.4.27.1	RULES_CACHED_IN_DEVICE_ACCESS_GRANTED_OR_NOT	1	RULES_CACHED_IN_DEVICE_ACCESS_GRANTED_SUCCESS__access_granted (c0-39-94)	Yes
5.4.27.2		2	RULES_CACHED_IN_DEVICE_ACCESS_GRANTED_SUCCESS__access_granted (ff-39-94)	Yes
5.4.27.3		3	RULES_CACHED_IN_DEVICE_ACCESS_GRANTED_SUCCESS__access_not_granted (c0-40-f5)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.27.4		4	RULES_CACHED_IN_DEVICE_ACCESS_GRANTED_SUCCESS__access_not_granted (ff-40-f5)	Yes
5.4.27.5		5	RULES_CACHED_IN_DEVICE_FILTER_APDU_SUCCESS__filter_not_passed (c0-5a-ed)	Yes
5.4.27.6		6	RULES_CACHED_IN_DEVICE_FILTER_APDU_SUCCESS__filter_not_passed (ff-5a-ed)	Yes
5.4.27.7		7	RULES_CACHED_IN_DEVICE_FILTER_APDU_SUCCESS__filter_passed (c0-27-ed)	Yes
5.4.27.8		8	RULES_CACHED_IN_DEVICE_FILTER_APDU_SUCCESS__filter_passed (ff-27-ed)	Yes
5.4.28.1	RULE_SPECIFIC_EXCLUDES_GENERIC_ONE	1	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__R1_SEApp1_DevApp1_ALWAYS__R2_SEApp1_DevApp2_NEVER (c0-25-7c)	Yes
5.4.28.2		2	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__R1_SEApp1_DevApp1_ALWAYS__R2_SEApp1_DevApp2_NEVER (ff-61-94)	Yes
5.4.28.3		3	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__R1_SEApp1_DevApp1_NEVER__R2_SEApp1_DevApp2_ALWAYS (c0-1d-e7)	Yes
5.4.28.4		4	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__R1_SEApp1_DevApp1_NEVER__R2_SEApp1_DevApp2_ALWAYS (ff-1d-e7)	Yes
5.4.28.5		5	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__rule_SEApp1_DevApp1__no_rule_SEApp1_DevApp2 (c0-a3-3d)	Yes
5.4.28.6		6	RULES_SPECIFIC_EXCLUDE_GENERIC_SUCCESS__rule_SEApp1_DevApp1__no_rule_SEApp1_DevApp2 (ff-a3-3d)	Yes
5.4.29.1	RULES_TARGET	1	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_ALWAYS (c0-0f-f2)	Yes
5.4.29.2		2	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_ALWAYS (ff-0f-f2)	Yes
5.4.29.3		3	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_FILTER (c0-ca-f7)	Yes
5.4.29.4		4	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_FILTER (ff-ca-f7)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.29.5		5	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_NEVER__NFC_Access_NEVER (c0-c5-18)	Yes
5.4.29.6		6	RULES_TARGET_SUCCESS__1_SEApp__1_DevApp__APDU_Access_NEVER__NFC_Access_NEVER (ff-c5-18)	Yes
5.4.29.7		7	RULES_TARGET_SUCCESS__1_SEApp__2_DevApp__APDU_Access_ALWAYS (c0-9c-6f)	Yes
5.4.29.8		8	RULES_TARGET_SUCCESS__1_SEApp__2_DevApp__APDU_Access_ALWAYS (ff-9c-6f)	Yes
5.4.29.9		9	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_ALWAYS (c0-3c-d7)	Yes
5.4.29.10		10	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_ALWAYS (ff-3c-d7)	Yes
5.4.29.11		11	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_FILTER (c0-8b-13)	Yes
5.4.29.12		12	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_FILTER (ff-8b-13)	Yes
5.4.29.13		13	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_NEVER (c0-68-75)	Yes
5.4.29.14		14	RULES_TARGET_SUCCESS__1_SEApp__All_DevApp__APDU_Access_NEVER (ff-68-75)	Yes
5.4.29.15		15	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_ALWAYS (c0-64-b0)	Yes
5.4.29.16		16	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_ALWAYS (ff-64-b0)	Yes
5.4.29.17		17	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_FILTER (c0-9c-4f)	Yes
5.4.29.18		18	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_FILTER (ff-9c-4f)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.29.19		19	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_NEVER (c0-88-b4)	Yes
5.4.29.20		20	RULES_TARGET_SUCCESS__All_SEApp__1_DevApp__APDU_Access_NEVER (ff-88-b4)	Yes
5.4.29.21		21	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_ALWAYS (c0-1a-31)	Yes
5.4.29.22		22	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_ALWAYS (ff-1a-31)	Yes
5.4.29.23		23	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_FILTER (c0-59-59)	Yes
5.4.29.24		24	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_FILTER (ff-59-59)	Yes
5.4.29.25		25	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_NEVER (c0-55-81)	Yes
5.4.29.26		26	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__APDU_Access_NEVER (ff-55-81)	Yes
5.4.29.27		27	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__NFC_Access_ALWAYS (c0-b1-9a)	Yes
5.4.29.28		28	RULES_TARGET_SUCCESS__All_SEApp__All_DevApp__NFC_Access_ALWAYS (ff-b1-9a)	Yes
5.4.30.1	RULES_CACHED_IN_DEVICE_REFRESH_TAG_DEVICE_SIDE	1	RULES_UPDATED_SUCCESS__All_rules_deleted (c0-53-95)	Yes
5.4.30.2		2	RULES_UPDATED_SUCCESS__All_rules_deleted (ff-53-95)	Yes
5.4.30.3		3	RULES_UPDATED_SUCCESS__Old_All_SEApp_DevApp1_ALWAYS__New_All_SEApp_All_DevApp_ALWAYS (c0-60-75)	Yes
5.4.30.4		4	RULES_UPDATED_SUCCESS__Old_All_SEApp_DevApp1_ALWAYS__New_All_SEApp_All_DevApp_ALWAYS (ff-60-75)	No

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.30.5		5	RULES_UPDATED_SUCCESS__Old_All_SEApp_DevApp1_NEVER__New_All_SEApp_DevApp2_ALWAYS (c0-d9-54)	Yes
5.4.30.6		6	RULES_UPDATED_SUCCESS__Old_All_SEApp_DevApp1_NEVER__New_All_SEApp_DevApp2_ALWAYS (ff-d9-54)	Yes
5.4.30.7		7	RULES_UPDATED_SUCCESS__Rule_All_SEApp_DevApp1_NEVER__Delete_All_SEApp_All_DevApp (c0-df-ce)	Yes
5.4.30.8		8	RULES_UPDATED_SUCCESS__Rule_All_SEApp_DevApp1_NEVER__Delete_SEApp1_DevApp1_ALWAYS (c0-07-84)	Yes
5.4.30.9		9	RULES_UPDATED_SUCCESS__rule_equally_restrictive_added__filters_merged (c0-e5-98)	Yes
5.4.30.10		10	RULES_UPDATED_SUCCESS__rule_equally_restrictive_added__filters_merged (ff-e5-98)	No
5.4.30.11		11	RULES_UPDATED_SUCCESS__rule_less_restrictive_added (c0-e8-d9)	Yes
5.4.30.12		12	RULES_UPDATED_SUCCESS__rule_less_restrictive_added (ff-e8-d9)	No
5.4.30.13		13	RULES_UPDATED_SUCCESS__rule_modified_from_APDU_access_ALWAYS_to_NEVER (c0-06-c3)	Yes
5.4.30.14		14	RULES_UPDATED_SUCCESS__rule_modified_from_APDU_access_ALWAYS_to_NEVER (ff-06-c3)	Yes
5.4.30.15		15	RULES_UPDATED_SUCCESS__rule_modified_from_APDU_access_NEVER_to_ALWAYS (c0-90-64)	Yes
5.4.30.16		16	RULES_UPDATED_SUCCESS__rule_modified_from_APDU_access_NEVER_to_ALWAYS (ff-90-64)	No
5.4.30.17		17	RULES_UPDATED_SUCCESS__rule_more_restrictive_added (c0-90-c9)	Yes
5.4.30.18		18	RULES_UPDATED_SUCCESS__rule_more_restrictive_added (ff-90-c9)	Yes
5.4.30.19		19	RULES_UPDATED_SUCCESS__rule_with_higher_priority_added (c0-a2-fd)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.30.20		20	RULES_UPDATED_SUCCESS__rule_with_higher_priority_added (ff-a2-fd)	Yes
5.4.30.21		21	RULES_UPDATED_SUCCESS__rule_with_lower_priority_added (c0-93-41)	Yes
5.4.30.22		22	RULES_UPDATED_SUCCESS__rule_with_lower_priority_added (ff-93-41)	No
5.4.31.1	SPECIFIC_CASE_ARF	1	SPECIFIC_CASE_ARF_ACCF_with_many_dummy_hashes (0b-a7-07)	Yes
5.4.31.2		2	SPECIFIC_CASE_ARF_ACRF_with_many_dummy_se_aids (0b-b9-07)	Yes
5.4.31.3		3	SPECIFIC_CASE_ARF_one_ACCF_with_2_hashes (0b-85-07)	Yes
5.4.31.4		4	SPECIFIC_CASE_ARF_shared_ACCF_for_2_different_rules (0b-11-07)	No
5.4.32.1	SPECIFIC_RULES_HAVE_PRIORITY	1	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_1_DevApp__R2_1_SEApp_All_DevApp (c0-3f-5e)	Yes
5.4.32.2		2	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_1_DevApp__R2_1_SEApp_All_DevApp (ff-3f-5e)	Yes
5.4.32.3		3	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_1_DevApp__R2_All_SEApp_1_DevApp (c0-e2-eb)	Yes
5.4.32.4		4	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_1_DevApp__R2_All_SEApp_1_DevApp (ff-e2-eb)	Yes
5.4.32.5		5	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_All_DevApp__R2_All_SEApp_1_DevApp (c0-9e-3b)	Yes
5.4.32.6		6	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_All_DevApp__R2_All_SEApp_1_DevApp (ff-9e-3b)	Yes
5.4.32.7		7	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_All_DevApp__R2_All_SEApp_All_DevApp (c0-db-bd)	Yes
5.4.32.8		8	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_1_SEApp_All_DevApp__R2_All_SEApp_All_DevApp (ff-db-bd)	Yes

TS.27 Numbering	Requirement	ID Test Case	GlobalPlatform Test case	Included
5.4.32.9		9	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_All_SEApp_1_DevApp__R2_All_SEApp_All_DevApp (c0-9b-05)	Yes
5.4.32.10		10	SPECIFIC_RULES_PRIORITY_SUCCESS__R1_All_SEApp_1_DevApp__R2_All_SEApp_All_DevApp (ff-9b-05)	Yes

B.9 NFC Forum Tag Operation and Analog Testing

B.9.1 Tag Operation

Reference test Specification: The test book refers to “NFC Forum Test Cases for Type-1 Tag Operation” specification.The following table indicates which test cases are included in the current version of the Test Book:

TS.27 Numbering	NFC Forum	Test case description
3.3.3.24.1.3.5.4.3	3.5.4.3	Read/Write Testing Static - Read Operation 2 [TC_T1T_READ_BV_2] - FFS
3.3.3.24.1.3.5.4.4	3.5.4.4	Read/Write Testing Static - Write Operation 2 [TC_T1T_WRITE_BV_2] - FFS
3.3.3.24.1.3.3.4.5	3.5.4.5	Read/Write Testing Static - Read Operation 3 [TC_T1T_READ_BV_3] - FFS
3.3.3.24.1.3.5.4.6	3.5.4.6	Read/Write Testing Static - Write Operation 3 to a READ_ONLY tag [TC_T1T_WRITE_BV_3] - FFS
3.3.3.24.1.3.5.4.9	3.5.4.9	Read/Write Testing Dynamic - Read Operation 5 [TC_T1T_READ_BV_5]
3.3.3.24.1.3.5.4.10	3.5.4.10	Read/Write Testing Dynamic - Write Operation 5 [TC_T1T_WRITE_BV_5]
3.3.3.24.1.3.5.4.11	3.5.4.11	Transition to READ ONLY [TC_T1T_TRANS_BV_1]

Reference test Specification: The test book refers to “NFC Forum Test Cases for Type 2 Tag Operation” specification.

The following table indicates which test cases are included in the current version of the Test Book:

TS.27 Numbering	NFC Forum	Test case description
3.3.3.24.2.3.5.2.1	3.5.2.1	NDEF Read from Version 1.2 Type 2 tag [TC_T2T_NDA_BV_1]
3.3.3.24.2.3.5.2.2	3.5.2.2	NDEF Read from Version 2.0 Type 2 tag [TC_T2T_NDA_BV_2]
3.3.3.24.2.3.5.4.1	3.5.4.1	NDEF Detection and Read from Type 2 tag (x = 0 to 2) [TC_T2T_NDA_BV_3_x]
3.3.3.24.2.3.5.4.2	3.5.4.2	NDEF Write on INITIALIZED Type 2 tag (x = 0 to 2) [TC_T2T_NDA_BV_4_x]
3.3.3.24.2.3.5.4.3	3.5.4.3	NDEF Write on READ-ONLY Type 2 tag [TC_T2T_NDA_BV_5]
3.3.3.24.2.3.5.4.4	3.5.4.4	Transitions from READ/WRITE to READ-ONLY (x = 0 to 2) [TC_T2T_NDA_BV_6_x]

Reference test Specification: The test book refers to “NFC Forum Test Cases for Type 3 Tag Operation”.

The following table indicates which test cases are included in the current version of the Test Book:

TS.27 Numbering	NFC Forum	Test case description
3.3.3.24.3.3.1.1.1	3.1.1.1	Manufacture Parameter (PMm) and Maximum Timing [TC_T3T_MEM_BV_1]
3.3.3.24.3.3.3.1.1	3.3.1.1	Frame Structure and Communication Protocol [TC_T3T_FTH_BV_1]
3.3.3.24.3.3.4.1.1	3.4.1.1	Update Command and Check Command [TC_T3T_CSE_BV_1]
3.3.3.24.3.3.4.2.1	3.4.2.1	Block List Format [TC_T3T_CSE_BV_2]
3.3.3.24.3.3.5.1.1	3.5.1.1	NDEF Management data RWFlag [TC_T3T_NDA_BV_1]
3.3.3.24.3.3.5.2.1	3.5.2.1	Versioning (x=0 to 2) [TC_T3T_NDA_BV_2_x]
3.3.3.24.3.3.5.3.1	3.5.3.1	NDEF Detection and Read Sequence (x=0 or 1) [TC_T3T_NDA_BV_3_x]
3.3.3.24.3.3.5.3.2	3.5.3.2	NDEF Write Sequence [TC_T3T_NDA_BV_4]

Reference test Specification: The test book refers to “NFC Forum Test Cases for Type 4 Tag”.The following table indicates which test cases are included in the current version of the Test Book:

TS.27 Numbering	NFC Forum	Test case description
3.3.3.24.4.3.5.2.1	3.5.2.1	NDEF Read from Version 2.2 Type 4 Tag [TC_T4T_NDA_BV_1]
3.3.3.24.4.3.5.2.2	3.5.2.2	NDEF Read from Version 3.0 Type 4 Tag [TC_T4T_NDA_BV_2]
3.3.3.24.4.3.5.4.1	3.5.4.1	NDEF Detection and Read from Type 4 Tag [TC_T4T_NDA_BV_3]
3.3.3.24.4.3.5.4.2	3.5.4.2	NDEF Write on INITIALISED Type 4 Tag [TC_T4T_NDA_BV_4]
3.3.3.24.4.3.5.4.3	3.5.4.3	NDEF Write on READ-ONLY Type 4 Tag [TC_T4T_NDA_BV_5]

B.9.2 Analog Tests

Reference test Specification: The test book refers to “NFC Forum Test Cases for Analog” [37].

The following table indicates which test cases references are included in the current version of the Test Book:

TS.27 Numbering	NFC Forum	Test case description
3.3.3.25.9.1.1.1	9.1.1.1	Ensure that an NFC-A Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the minimum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device. [TC_AN_LIS_NFCA_01]

TS.27 Numbering	NFC Forum	Test case description
3.3.3.25.9.1.1.2	9.1.1.2	Ensure that an NFC-A Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the nominal operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device. [TC_AN_LIS_NFCA_02]
3.3.3.25.9.1.1.3	9.1.1.3	Ensure that an NFC-A Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the maximum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device. [TC_AN_LIS_NFCA_03]
3.3.3.25.9.1.1.4	9.1.1.4	Ensure that an NFC-B Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the minimum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device as described below. [TC_AN_LIS_NFCB_01]
3.3.3.25.9.1.1.5	9.1.1.5	Ensure that an NFC-B Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the nominal operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device. [TC_AN_LIS_NFCB_02]
3.3.3.25.9.1.1.6	9.1.1.6	Ensure that an NFC-B Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the maximum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device. [TC_AN_LIS_NFCB_03]
3.3.3.25.9.1.1.7	9.1.1.7	Ensure that an NFC-F Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the minimum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_01_x]
3.3.3.25.9.1.1.8	9.1.1.8	Ensure that an NFC-F Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the nominal operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_02_x]
3.3.3.25.9.1.1.9	9.1.1.9	Ensure that an NFC-F Listening Device functions properly within the Operating Volume of the NFC Forum Reference Polling Device when the maximum operating conditions have been established on the NFC Forum Reference Polling Device with the NFC Forum Reference Listening Device using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_03_x]

TS.27 Numbering	NFC Forum	Test case description
3.3.3.25.9.1.1.10	9.1.1.10	Ensure that the loading effect of the Listening Device does not exceed the voltage drop ΔVOV at J2 on the NFC Forum Reference Polling Device when the Listening Device is placed on the NFC Forum Reference Polling Device. [TC_AN_LIS_UND_01]
3.3.3.25.9.1.1.11	9.1.1.11	Ensure that the Listening Device under test is able to function correctly when the carrier frequency value is on the limits. [TC_AN_LIS_UND_02]
3.3.3.25.9.1.1.12	9.1.1.12	Ensure that The NFC-A Listening Device under test is correctly reset when the power level is reduced to VS,OV,RESET for a time tFIELD_OFF. [TC_AN_LIS_NFCA_04]
3.3.3.25.9.1.1.13	9.1.1.13	Ensure that The NFC-B Listening Device under test is correctly reset when the power level is reduced to VS,OV,RESET for a time tFIELD_OFF. [TC_AN_LIS_NFCB_04]
3.3.3.25.9.1.1.14	9.1.1.14	Ensure that The NFC-F Listening Device under test is correctly reset when the power level is reduced to VS,OV,RESET for a time tFIELD_OFF using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_04_x]
3.3.3.25.9.1.2.1	9.1.2.1	Ensure that the NFC-A Listening Device under test is able to work correctly when a polling command is sent with limit modulation characteristics. [TC_AN_LIS_NFCA_06]
3.3.3.25.9.1.2.2	9.1.2.2	Ensure that the NFC-B Listening Device under test is able to work correctly when a polling command is sent with limit modulation characteristics. [TC_AN_LIS_NFCB_06]
3.3.3.25.9.1.2.3	9.1.2.3	Ensure that the NFC-F Listening Device under test is able to work correctly when a polling command is sent with limit modulation characteristics using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_06_x]
3.3.3.25.9.1.3.1	9.1.3.1	Ensure that the amplitude of the load modulation of the NFC-A Listening Device under test is greater than the limit when the Listening Device under test is placed into the operating volume. [TC_AN_LIS_NFCA_07]
3.3.3.25.9.1.3.2	9.1.3.2	Ensure that the amplitude of the load modulation of the NFC-B Listening Device under test is greater than the limit when the Listening Device under test is placed into the operating volume. [TC_AN_LIS_NFCB_07]
3.3.3.25.9.1.3.3	9.1.3.3	Ensure that the amplitude of the load modulation of the NFC-F Listening Device under test is greater than the limit when the Listening Device under test is placed into the operating volume using a bitrate of 212kbps/424kbps. [TC_AN_LIS_NFCF_07_x]
3.3.3.25.9.1.3.4	9.1.3.4	Ensure that the Listening Device under test produces subcarrier modulation that will be compatible with the modulation NFC-A expected by the Polling Device's receiver when the Listening Device under test is placed into the operating volume. [TC_AN_LIS_NFCA_08]
3.3.3.25.9.1.3.5	9.1.3.5	Ensure that the Listening Device under test produces subcarrier modulation that will be compatible with the modulation NFC-B expected by the Polling Device's receiver when the Listening Device under test is placed into the operating volume. [TC_AN_LIS_NFCB_08]

TS.27 Numbering	NFC Forum	Test case description
3.3.3.25.9.2.1.1	9.2.1.1	Ensure that the Polling Device under test provides RF field strength according to the minimum limit to power a Listening Device when the Listening Device is placed into the operating volume. [TC_AN_POL_UND_01]
3.3.3.25.9.2.1.2	9.2.1.2	Ensure that the Polling Device under test provides RF field strength according to the maximum limit to power a Listening Device when the Listening Device is placed into the operating volume. [TC_AN_POL_UND_02]
3.3.3.25.9.2.1.3	9.2.1.3	Ensure that the carrier frequency fC provided by the Polling Device under test is inside the minimum and maximum limits when the poller emits a carrier without any Modulation. [TC_AN_POL_UND_03]
3.3.3.25.9.2.1.4	9.2.1.4	Ensure that the residual carrier amplitude and duration are compliant with the specification when the Polling Device under test is emitted a reset. [TC_AN_POL_UND_04]
3.3.3.25.9.2.1.5	9.2.1.5	Ensure that the Polling Device under test is prevented from generating a carrier when in a presence of another Polling Device already generating a carrier such that it will not cause interference. [TC_AN_POL_UND_05]
3.3.3.25.9.2.2.1	9.2.2.1	Ensure that a Polling Device produces NCF-A modulation characteristics that are within a Listening Device's receiver capability when the NFC Forum Reference Listening Device is placed into the operating volume. [TC_AN_POL_NFCA_01]
3.3.3.25.9.2.2.2	9.2.2.2	Ensure that a Polling Device produces NCF-B modulation characteristics that are within a Listening Device's receiver capability when the NFC Forum Reference Listening Device is placed into the operating volume. [TC_AN_POL_NFCB_01]
3.3.3.25.9.2.2.3	9.2.2.3	Ensure that a Polling Device produces NCF-F modulation characteristics that are within a Listening Device's receiver capability when the NFC Forum Reference Listening Device is placed into the operating volume using a bitrate of 212kbps/424kbps. [TC_AN_POL_NFCF_01_x]
3.3.3.25.9.2.3.1	9.2.3.1	Ensure that the receiver of the Polling Device under test is sufficiently sensitive to be able to receive an NFC-A load modulation when the NFC Forum Reference Listening Device is placed into the operating volume. [TC_AN_POL_NFCA_02]
3.3.3.25.9.2.3.2	9.2.3.2	Ensure that the receiver of the Polling Device under test is sufficiently sensitive to be able to receive an NFC-B load modulation when the NFC Forum Reference Listening Device is placed into the operating volume. [TC_AN_POL_NFCB_02]
3.3.3.25.9.2.3.3	9.2.3.3	Ensure that the receiver of the Polling Device under test is sufficiently sensitive to be able to receive an NFC-F load modulation when the NFC Forum Reference Listening Device is placed into the operating volume using a bitrate of 212kbps/424kbps. [TC_AN_POL_NFCF_02_x]

Annex C Reference Tags - Real NFC Tags

The following is a list of currently available reference NFC tags that can be used in the scope of this document. Other suitable tags can also be used; for example, tags listed in previous version of TS.27 are considered suitable.

- Topaz512 (Type 1 Tag, Broadcom) NDEF Formatted for 466 bytes of Dynamic User Memory, Antenna Size = 43x43mm
- NTAG213 (Type 2 Tag, NXP) NDEF Formatted for 144 bytes of Dynamic User Memory, Antenna Size = 42mm diameter
- NTAG213 (Type 2 Tag, NXP) NDEF Formatted for up to 48 bytes of Static User Memory, Antenna Size = 42mm diameter
- Mifare Ultralight EV1 (Type 2 Tag, NXP), to be NDEF formatted, for 48 Bytes of Static User Memory, Antenna Size = 80x50mm
- FeliCa Lite-S (Type 3 Tag, Sony Corp.) NDEF Formatted for 208 bytes of User Memory, Antenna Size = 43x43mm
- Mifare DESFire (Type 4A Tag, NXP) NDEF Formatted for 2k bytes of User Memory, Antenna Size = 80x50mm
- RF430CL330H associated with RF430CL330HTB board antenna coil (Type 4B Tag, Texas Instruments) NDEF Formatted for 3k bytes of User Memory, Antenna Size = 40mmx35mm

NOTE 1: The provided lists of NFC Tags do not include NFC Type 1 Tag with Static Memory layout. Currently there are no commercially available Type 1 Tags with Static Memory Layout.

Annex D NFC Device Implementation statement (Informative)

The xls below indicates the device features and all test cases from the present version of the Test Book:



TS27_Device_featur
e_statement_V9-0.xl

Annex E Test Case configuration files

E.1 Reference PKCS#15 files

E.1.1 Directory file (EF_DIR)

Files Type	Elementary File	
Data Structure	Record	
File ID	3F00 2F00	
	Access Conditions	
	READ	Always

Data Object						Additional record for EF_DIR
T	***T***	***T***	***T***	***T***	***L***	***V***
61					14	
	4F				0C	A000000063504B43532D3135
	51				04	3F00 7F50

E.1.2 Object Directory File (EF_ODF)

Files Type	Elementary File	
Data Structure	Transparent	
File ID	5031	
	Access Conditions	
	READ	Always

Data Object						
T	***T***	***T***	***T***	***T***	***L***	***V***
A5					06	
	30				04	
		04			02	5205
A7					06	
	30				04	
		04			02	5207

E.1.3 Data Object Directory File (EF_DODF)

Files Type	Elementary File	
Data Structure	Transparent	
File ID	5207	
	Access Conditions	
	READ	Always

Data Object						
T	***T***	***T***	***T***	***T***	***L***	***V***
A1					29	
	30				00	
	30				0F	
		0C			0D	475020534520416363204374 6C
	A1				14	
		30			12	
			06		0A	2A864886FC6B81480101
			30		04	
				04	02	4200

E.1.4 Certificate Directory File (EF_CDF)

Files Type	Elementary File	
Data Structure	Transparent	
File ID	5205	
	Access Conditions	
	READ	Always

Data Object						Certificate #1
T	***T***	***T***	***T***	***T***	***L***	***V***
30					1D	
	30				0C	
		0C			0A	47534D41203031204341
	30				03	

		04			01	01
	A1				08	
		30			06	
			30		04	
				04	02	4361
Data Object						Certificate #2
T	***T***	***T***	***T***	***T***	***L***	***V***
30					1D	
	30				0C	
		0C			0A	47534D41203032204341
	30				03	
		04			01	02
	A1				08	
		30			06	
			30		04	
				04	02	4362

E.2 Reference GSMA files for PKCS#15 structure

E.2.1 Certificate Files

The content of the file is not described in this document but it is understood that it should be filled by X.509 certificates [29].

Certificate #01		
Files Type	Elementary File	
Data Structure	Transparent	
File ID	4361	
	Access Conditions	
	READ	Always

Certificate #02	
Files Type	Elementary File
Data Structure	Transparent
File ID	4362

	Access Conditions	
	READ	Always

E.2.2 Access Control Files

EF ACMain	
Files Type	Elementary File
Data Structure	Transparent
File ID	4200
	Access Conditions
	READ Always

Data Object						
T	***T***	***T***	***T***	***T***	***L***	***V***
30					10	
	04				08	0102030405060708
30					04	
	04				02	4300

EF ACRules	
Files Type	Elementary File
Data Structure	Transparent
File ID	4300
	Access Conditions
	READ Always

E.3 AIDs referenced by PKCS#15 files

The reference PKCS#15 structures are using the following AID-s:
AID01 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31’

AID02 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 32’

AID03 = ‘A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 33’

E.4 Specific configuration files for test case 5.3.1.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 08 82 00 30 04 04 02 43 10

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

E.5 Specific configuration files for test case 5.3.1.2

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 00

E.6 Specific configuration files for test case 5.3.1.3

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 08 82 00 30 04 04 02 43 10

ACConditions1:
30 00

E.7 Specific configuration files for test case 5.3.1.4

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

E.8 Specific configuration files for test case 5.3.1.5

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)
|- EF ACConditions2 (4311)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 11

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

ACConditions2:
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

E.9 Specific configuration files for test case 5.3.1.6

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

E.10 Specific configuration files for test case 5.3.1.7

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)
|- EF ACConditions2 (4311)

ACRules:
30 08 82 00 30 04 04 02 43 10
30 08 82 00 30 04 04 02 43 11

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

ACConditions2:
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

E.11 Specific configuration files for test case 5.3.1.8

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 32 30 04 04 02 43 10

ACConditions1:

30 16 04 14 [Hash of Certificate #01 (20 bytes)]

E.12 Specific configuration files for test case 5.3.1.9

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)
|- EF ACConditions2 (4311)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 11

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

ACConditions2:
30 00

E.13 Specific configuration files for test case 5.3.2.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 00

E.14 Specific configuration files for test case 5.3.2.1 Step5

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files

|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 08 04 06 [6 first bytes of the hash of Certificate #01] <!-- corrupted Hash -->

E.15 Specific configuration files for test case 5.3.2.2

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 00

E.16 Specific configuration files for test case 5.3.3.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

E.17 Specific configuration files for test case 5.3.3.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)
|- EF ACRules (4300) --> shall reference EF ACConditions files

|- EF ACConditions1 (4310)

ACRules:

30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:

30 16 04 14 [Hash of Certificate #01 (20 bytes)]

PKCS#15 file system

|- EF ACRules (4300) --> shall reference EF ACConditions files

|- EF ACConditions1 (4310)

ACRules:

30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 32 30 04 04 02 43 10

ACConditions1:

30 16 04 14 [Hash of Certificate #02 (20 bytes)]

E.18 Specific configuration files for test case 5.3.4.1

PKCS#15 file system

|- EF ACRules (4300) --> shall reference EF ACConditions files

|- EF ACConditions1 (4310)

ACRules:

30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:

30 16 04 14 [Hash of Certificate #01 (20 bytes)]

E.19 Specific configuration files for test case 5.3.5.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files

|- EF ACConditions1 (4310)

|- EF ACConditions2 (4311)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 32 30 04 04 02 43 11

ACConditions1:
30 16 04 14 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01
30 16 04 14 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02
30 16 04 14 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03
30 16 04 14 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04
30 16 04 14 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05
30 16 04 14 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06
30 16 04 14 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07
30 16 04 14 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08
30 16 04 14 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09
30 16 04 14 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

ACConditions2:
30 16 04 14 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01
30 16 04 14 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02 02
30 16 04 14 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03
30 16 04 14 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04
30 16 04 14 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05 05
30 16 04 14 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06 06
30 16 04 14 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07 07
30 16 04 14 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08
30 16 04 14 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09 09
30 16 04 14 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A 0A
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

E.20 Specific configuration files for test case 5.3.5.2

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

|- EF ACConditions2 (4311)
|- EF ACConditions3 (4312)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 52 41 44 32 30 04 04 02 43 11
30 1A A0 12 04 10 A0 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 30 04 04 02 43 12
30 1A A0 12 04 10 A0 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 30 04 04 02 43 12
...
<!--44 rules with dummy AID-->
...
30 1A A0 12 04 10 A0 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 47 30 04 04 02 43 12
30 1A A0 12 04 10 A0 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 48 30 04 04 02 43 12

ACConditions1:
30 16 04 14 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01
30 16 04 14 [Hash of Certificate #01 (20 bytes)]

ACConditions2:
30 16 04 14 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

ACConditions3:
30 16 04 14 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03 03
30 16 04 14 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04 04

E.21 Specific configuration files for test case 5.3.6.2

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

ACRules:
<!-- ACRF is absent -->

ACConditions:
<!-- ACCF is absent -->

E.22 Specific configuration files for test case 5.3.6.3

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files

ACRules:
<!-- ACRF is present but empty -->

ACConditions:
<!-- ACCF is absent -->

E.23 Specific configuration files for test case 5.3.6.4

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 12 04 10 [16 first bytes of the hash of Certificate #01]

E.24 Specific configuration files for test case 5.3.6.5

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 1A A0 12 04 10 A0 00 00 05 59 50 00 00 00 00 00 00 00 52 41 44 31 30 04 04 02 43 10

ACConditions1:
30 18 04 16 F5 75 8A C7 F3 1C 1C F7 7F 45 1D 37 E3 15 CA 03 F9 89 59 2A 00 00

E.25 Specific configuration files for test case 8.3.4.1

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 08 82 00 30 04 04 02 43 10

ACConditions1:
30 00

E.26 Specific configuration files for test case 8.3.4.2

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 08 82 00 30 04 04 02 43 10

ACConditions1:
30 00

E.27 Specific configuration files for test case 8.3.4.3

PKCS#15 application (AID: A0 00 00 00 63 50 4B 43 53 2D 31 35)

|- EF ACRules (4300) --> shall reference EF ACConditions files
|- EF ACConditions1 (4310)

ACRules:
30 08 82 00 30 04 04 02 43 10

ACConditions1:
30 16 04 14 [Hash of Certificate #02 (20 bytes)]

Annex F Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.2	10/09/13	First published version	GSM Association	GSMA NFC Project
2.0	15/01/14	Updated in accordance with the NFC Handset Requirements version 4.0	TSG	Paul Gosden/ GSMA
3.0	25/04/14	Updated Introduction, Scope, Abbreviations, Terms of Definitions, References An enhanced document structure with a new test case and section numbering. A new test case layout with aligned structure for all test cases. Addition of tables for recommended Test Case Applicability and a list of optional device features. Improvements to the definition of the Test Environment Improvements of existing Test Cases Addition of new Test Cases or deletion of Test Cases (e.g. if covered by referenced specifications or other Test Cases) Tables in the Annex with a complete list of test cases and an option and applicability table.	TSG	P Gosden GSMA
4.0	10/10/14	The changes to the TS.27 NFC Handset Test Book V4.0 include the following:) Alignment with TS.26 NFC Handset Requirement V6.0.) Test descriptions improvements within many sections.) Adoption of Global Platform SEAC Test Plan V1.06, section 5 (169 tests).) New test cases added in sections 3, 7, 8, 11, 12 and 15 (60 tests).) Reference to GCF WI-190 included to align with GCF(5 tests).) Applicability table updated.) Removal of SCWS.) Tables in the Annex with a complete list of test cases, Option and Applicability table.	TSG	Kay Fritz, Donna Mackay.

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
5.0	12/01/15	The changes to the TS.27 NFC Handset Test Book V5.0 include the following: <u>Change to existing test cases:</u> • Test case improvements throughout sections 3, 7, 8, 12, 13, 15. • Renaming of AID RID from ”undefined” to GSMA ID. • Inclusion of details for handling of application certificates. • Applicability table updated. Adding iOS and “Other OS” - contents for FFS. • Removal of redundant tables in Annexes. • Improved description of tables in section 2. • Various editorial improvements throughout the document. <u>New and removed test cases:</u> • 36 new tests added to sections 8, 12, 13 and 15. • 103 new tests from GlobalPlatform SEAC Test Plan referenced in section 5. • 2 tests removed from section 13 (due to redundancy).	TSG	Kay Fritz
6.0	08/06/15	<u>Change to existing test cases:</u> • Test case improvements in sections 3, 7, 8, 12, 13, 15. • Baseline requirement reference to TS.26 V7.0. • Java Source code in Annex A.5 moved to GitHub. • 11 tests removed (VOID’ed) from Sect 3 (FFS), 7 (FFS) and 12. None of these tests were allocated in GCF WI. (4 FFS tests left). • Applicability table expanded with reference to TS.26 version. (Proposed by GCF LS) • Annex D with complete list of test cases moved to separate excel (Proposed by GCF LS). This excel also provide a copy (Non-Normative) of table with Optional Features (sect 2.1.4) and list of external test cases (Annex B1, B.8, B.9). • New Optional Features added, sect 2.1.4. • Clarification of mandatory features in TS.27 vs. optional features in external standards (sect 2.2.1). • Various editorial improvements throughout the document. <u>New test cases:</u> • 20 new tests added to section 12, 13 and 15. • 3 tests updated from FFS to complete status in section 12.	TSG	Kay Fritz

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		• 26 new tests from NFC Forum Tag Operation tests referenced in section 3.		
6.1	20/07/15	Due to a duplicate test numbering in Annex B.9, one extra digit is added after the main number 3.3.3.24. This change applies only for the test cases listed in Annex B.9.	TSG	Kay Fritz
7.0	21/12/15	Specification alignment: TS.26 V8.0 alignment incl. TC updates to align GSMA API Existing TCs updated with conditional branching for GSMA API version New section 2.6 with procedures for default HCE/UICC routing and routing table handling New DUT options for section 12 and 15 New tests: 4 Secure Element Access API tests (OPMAPI) 18 Android specific section 15 33 Analogue NFC Forum test cases Removed tests: 1 GP SEAC test 5 tests for NFC Forum Tag Type 1 with static memory General improvements: New table for information to be provided by vendor, sect 2.1.6 Updated applicability and new conditions for tests in section 7, 12, and 15 Various TC improvements to section 3, 7, 8, 12,13, 15 Updated reference Tags.	TSG	Kay Fritz
8.0	22/02/16	Note 13 changes: • Section 2.1.4: Optional feature “Support of NFC Forum Analog Test” and related Note 13 are removed. • Section 2.1.5: Test case applicability for 3.3.3.25 changed to Mandatory and related condition removed. Other technical corrections: • Section 2.5.3.2: Correction/clarifications in definition of Device Applications. • Section 2.6.2: Corrections to Applications needed and test steps. • Section 2.6.3: Comment added to “Procedure to send a transaction event”. Editorial corrections: • Removal and replacement of references to ISO 14443. • Other editorial corrections	TSG	Kay Fritz

Version	Date	Brief Description of Change	Approval Authority	Editor / Company

9.0	24/06/16	The changes to the TS.27 V9.0 include the following:
		• Compliant to and referencing latest TS.26 V9.0.
		• 10 new test cases to reduce testing gaps in the following sections:
		  • 7. Multiple Card Emulation Environment (2 new tests)
		  • 12. Remote Management of NFC Services (2 new tests)
		  • 13. General Device Support (3 new tests)
		  • 15. Android specific test cases (3 new tests)
		• 2 Voided tests from section
		  • 7. Multiple Card Emulation Environments. See list of test cases below.
		• The versions of referenced ETSI and 3GPP specifications are updated to reference a newer or the latest versions.
		• Reference to EMVCo updated Mobile Level 1 Analog, Digital, Interoperability and performance testing requirements.
		• New reference Type 2 Tag with static memory added. TS.27 Annex C.
		• Naming suffix added for test sequences which previously did not have specific sequence names. See details below.
		• Various corrections and improvements to existing test cases
		• Various editorial improvements.
		A version of TS.27 with track changes can be requested at GSMA.
			TSG	Kay Fritz

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Your comments or suggestions & questions are always welcome.