

Technical Adaptation of Devices through Late Customisation

Version 14.0

02 October 2023

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1 Introduction

1.1 Overview

This document provides recommendations on a framework for manufacturers and MNO's (mobile network operators) so they can technically configure Open Market mobile devices, to ensure the device can support the customer with the services being promoted and offered by the MNO.

The configurations would typically take place upon 1st insertion of a SIM, by a process that is known as Late Customisation, and is referred to in this document as the Technical Adaptation of a Device (TAD)

Without harmonisation of this process across the industry and a clear understanding of which settings must be configured, each manufacturer and MNO face the challenge of having to document, in individual bilateral agreements, the technical settings they need implementing. Without a clear framework a device is being configured for a 2nd time could inherit some legacy settings from its 1st configuration, unless it is clearly understood which settings should always be configured. It is desirable to avoid such unintentional inheritance as it could compromise the performance of the MNO services and the device itself.

1.2 Scope

This document aims to describe the settings that SHOULD be configured whenever a Technical 'Late Customisation' package is deployed to a device. The assumption is that the customisation packages are deployed using a mechanism under the control of the device manufacturer. The deployment mechanism is not in scope of this document.

The document also describes at high level the scenarios when a customisation package would be triggered for deployment.

This document does not specifically cover the Late Customisation of applications layer customisations including deployment of MNO specific apps, UI (User Interface) customisation and branding assets. However it is recognised that many MNO's offer services to customers which can use customisation of Application layer features and parameters e.g. start page, bookmarks, Google client ID, speed dial, such settings can be added in table "MNO Supplementary" although it should be noted that implementation whilst strongly encouraged is at the discretion of the OEM (Original Equipment Manufacturer).

Marketing assets such as graphical branding, OS (Operating System) and UI (User Interface) branding and installation of specific apps are not in scope of TS.32.

1.3 Definitions

Term	Description
Factory Reset	User-initiated process by which the device is returned to the state it is normally delivered in from the factory. This implies erasing all user-installed applications and data, and restoration of configuration values to those that were applied when the device left the factory. SIM Lock settings and status are NOT changed as part of this process.

Term	Description
General Settings	If an MNO is host of MVNOs, they may have General Settings for all their MVNOs that have not provisioned their own Settings. General Settings use the MNOs MCC/MNC values, but do not define the GID/SPN values. The General Settings ensure the functionality of the MNO's services for their MVNOs.
In Life Service	A service provided by the MNO for use on the customer device, when the customer is under contract with that MNO
Late Customisation	A term used to describe the process for configuring a device upon 1st SIM insertion by a customer, after the point of sale. Usually managed and deployed by the Manufacturer.
Manufacturer	The commercial entity that designs and either directly fabricate, or uses a 3rd party fabrication of a Mobile Device, and manages the TAD deployment service.
MNO Provisioning	Configuration and activation of an 'in life' service by an MNO. Usually managed and deployed by the MNO.
Open Market mobile devices	An Open Market mobile device is a device which is sold through a retail channel not tied or aligned with an MNO or MVNO. A device that is intended for potential distribution to more than one MNO. As such, the device should be able to take on the customization values of all MNOs whose SIM cards may end up being inserted into the device.
SIM Lock	A SIM lock, network lock or subsidy lock is a technical restriction built into devices by the devices manufacturers for use by services providers to restrict the use of these phones to specific countries and/or networks. Personalisation of Mobile Equipment, as defined in 3GPP TS22.022 (ETSI TS 122 022) allows a device to be restricted to only accepting SIM cards that meet certain criteria. For the purposes of this document, it is focused on network personalisation and/or SP personalisation.
TAD	Technical Adaptation of Devices – a terms to describe the technical configuration of a device using Late Customisation

1.4 Abbreviations

Term	Description
5G-NR	5G New Radio
5GS	5G System
APN	Access Point Name
GID_1	Elementary File - Group Identifier level 1`
ICCID	Integrated Circuit Card Identifier This is a unique number to identify a Profile in an UICC as defined by ITU-T E.118 [4]
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
MCC	Mobile Country Code
MNC	Mobile Network Code
MNO	Mobile Network Operator
MVNO	Mobile Virtual Network Operator

Term	Description
NR	New Radio
RILTE	Roaming in LTE
SIM	Subscriber Identity Module
SPN	Service Provider Name
OEM	Original Equipment Manufacturer
OS	Operating System
TAD	Technical Adaptation of Devices – a term to describe the technical configuration of a device using Late Customisation
UI	User Interface
UICC	Universal Integrated Circuit Card
UNI	User Network Interface
UPG	UNI Profile Group
VoLTE	Voice over LTE

1.5 References

Ref	Doc Number	Title
[1]	GSMA PRD TS.36	Devices Settings Database specification
[2]	GSMA PRD IR.92	IMS Profile for Voice and SMS
[3]	RFC2119	RFC 2119 - Key words for use in RFCs to Indicate Requirement Levels
[4]	ITU-T E.118	The International Telecommunication Union charge card
[5]	GSMA PRD IR.94	IMS Profile for Conversational Video Service
[6]	GSMA PRD IR.51	IMS Profile for Voice, Video and SMS over untrusted Wi-Fi access
[7]	GSMA PRD NG.106	IMS Profile for Voice, Video and SMS over trusted Wi-Fi access
[8]	GSMA PRD NG.102	IMS Profile for Converged IP Communications
[9]	GSMA PRD NG.114	IMS Profile for Voice, Video and Messaging over 5GS
[10]	GSMA PRD IR.25	VoLTE Roaming Testing
[11]	GSMA PRD TS.06	IMEI Allocation and Approval Process

1.6 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 (RFC2119) [3] (RFC8174) [5] when, and only when, they appear in all capitals, as shown here.

2 Technical Adaptation of Devices

2.1 Introduction

This section describes what is and what is not relevant for a TAD late customisation, the high level process to be used to identify the correct package to be deployed, and when it should be deployed.

2.2 Late Customisation

Late Customisation is the use of techniques to configure devices at the point of SIM detection, rather than pre-configuring the device in the manufacturer's production line.

A TAD late customisation focuses on the configuration of technical settings for core features supported by the network and device, typically related to Voice calls, messaging and data services.

2.3 Difference between TAD late customisation and MNO Provisioning.

It is important to understand the difference between a TAD late customisation, and MNO provisioning.

TAD through late customisation is implemented on a device by the deployment of a customisation package which is typically managed and deployed by the manufacturer; this process will be triggered at the first use, on insertion of a SIM, or after a Factory Reset of the device. It will customise technical settings that are not normally configurable by the MNO or the end user.

MNO provisioning is carried out by an MNO when enabling an 'in life' service for a customer. Settings which can be customised via MNO provisioning would not normally be part of a TAD late customisation package.

However, in some circumstances it may be applicable for a TAD package to set a default value of such settings in a device, in order to provide a common baseline, so that MNO's can be confident of the devices default configuration, even if a service is not enabled by them.

2.4 User experience

The customer's experience of a TAD implementation must positive and equivalent to a device with preconfigured software. In particular, the boot time (from power on to the user's interaction with the manufacturer's start-up wizard) SHALL be similar.

It is not necessary for the device to notify the user of the customisation being applied, but if the manufacturer chooses to provide such a notification, the wording must be clear and unambiguous. If considered appropriate the information relevant to the TAD customisation can form part of the interaction within the start-up wizard.

2.5 SIM lock

A TAD customisation of an Open Market device SHALL not apply a SIM lock.

A Device that is SIM locked SHALL only be customisable to that SIM's customisation profile.

2.6 Software and OS updates

If a manufacturer deploys a Software or OS (Operating System) update to a device, which changes any of the parameters and values for settings (as defined in TS.32) of the already configured services and features on the device, the device shall initiate a TAD reconfiguration based the appropriate TAD settings for the MNO profile to restore the device back to the settings configuration prior to the update.

2.7 First boot with no SIM card

If the device is first booted without a SIM, then the 'out of box' software configuration SHALL be used until the SIM is inserted for the first time.

Should the TAD configuration mechanisms deployed by the manufacturer require a Factory Reset to deploy the TAD customisation, once insertion of the SIM is carried out, the user SHALL be informed during the initial boot up that any personalisation they make prior to insertion of a SIM, including accounts setup, or user data created on the device (e.g. photos) may be deleted as part of the configuration process once a SIM is inserted.

2.8 First SIM configuration

SIM detection and subsequent customisation SHALL occur with the first SIM inserted into the device, typically as part of the boot up and initialisation of the device.

2.9 Customisation Package identification (SIM card and customer profile identification)

A device implementing TAD customisations SHALL be able to distinguish between the different MNO SIM cards and customers profiles

It is recommended that manufacturer's use the following combination of identifiers in order to ensure they implement the appropriate customisation package. The precise method and algorithm used by the manufacturer to perform any lookup and identification is at their discretion, providing they achieve the required level of granularity without needing user interaction.

Most countries permit the support of one or more MVNOs (Mobile Virtual Network Operator) on MNO networks, sharing Mobile Country Code (MCC) and Mobile Network Code (MNC).

In the case of an MVNO using a Roaming Brokering service provided by their host MNO, which will involve a device potentially having multiple IMSI (International Mobile Subscriber Identity) and MNC, the inclusion of the ICCID (Integrated Circuit Card Identifier) is strongly recommended, and that OEM's include this as part of their algorithm for identifying when and what customisation package to deploy.

However since the ICCID support is optional, the MVNO using a Roaming Brokering service provided by their host MNO shall always provide the needed setting templates for each of the different MCC/MNC/SPN (Service Provider Name) or GID (Group Identifier level) values used.

Therefore, when identifying MVNOs using a Roaming Broker solutions, OEMs need to consider that their customization package can be spread across several MCC/MNC values.

It is also possible that different TAD customisations will need to be implemented by the same MNO based on customer profile (Business, Consumer, Post Pay, Pre Pay etc.)

If an MVNO is identified, for which there are no specific settings available, the OEM shall use the parent MNOs General Settings. The General Settings of the parent MNO may be identified by the MCC/MNC codes. General Settings do not have any entrys for the GID/SPN values.

SIM card and customer profile identifiers
Mobile Country Code (MCC)
Mobile Network Code (MNC)
Service Provider Name (SPN)
GID_1 (if applicable)
IMSI prefix/range (if applicable)
ICCID prefix/range (if applicable)

Figure 1: SIM card and customer profile identifiers

2.10 If no customisation package exists for the Identified MNO/MVNO

If no customisation package exists for the identified MNO/MVNO then the GSMA recommends that manufacturers SHOULD deploy a generic package based on default values identified in section 3, if specified; where default values are not specified the manufacturers preferred value SHOULD be used.

2.11 If OEM is unable to identify the MNO/MVNO

If the MNO/MVNO cannot be identified, the GSMA recommends that manufacturers SHOULD deploy a generic package based on default values identified in section 3, where default values are not specified the manufacturers preferred value SHOULD be used.

2.12 SIM Swap or factory reset

2.12.1 Factory reset

A factory reset SHALL take the device back to ‘out-of-box settings’. If the device is restored to out-of-box settings (factory reset) then the TAD customisation should be invoked when a SIM is inserted.

This allows a User to change MNO or to pass their device to a different User who will have an Open market-like device.

The factory reset SHALL delete all user content. It would be appropriate to ensure users are fully aware of this and encouraged to take suitable steps to protect and backup critical data.

2.12.2 SIM Swap

If a device has been configured with the first SIM card, and later a different SIM card is inserted, the TAD mechanism MAY be triggered.

Any deployment of a TAD customisation package in such a scenario SHALL require interaction and permissions from the customer.

Should such a change be implemented then the manufacturer SHALL be able to configure the device back to the original MNO settings, should the 1st SIM card be re-inserted. Unless the user confirms that they do not require roll back to the original configuration.

When such a use case is encountered the following SHALL always apply.

1. Reconfigure Specific Technical Settings as defined in this document, the manufacturer must ensure continuity of key services including voice, messaging and data connection.
2. Minimise impact on the user ensuring a smooth user experience during this configuration.
3. Protect user content and service configurations not specific to the new MNO, i.e. any account, personal data and files must be backed up for automatic restoration or remain untouched unless the user gives permission to remove them.

Users should be notified that some services such as sending email may not work until they have configured the application based on the requirements of the new MNO, they should be referred to their MNO for these settings

2.12.3 Use cases.

Scenario No 1

A device is powered on for the first time with an MNO-1 SIM. The device is configured according to MNO-1's requirements.

The device is subsequently turned on with an MNO-2 SIM card: The Device will identify if the Manufactures Late Customisation package for the MNO/Device is available.

If a Late customisation package is available, the User is asked if they wish to re-configure the device for the MNO-2 SIM. If yes then the process's described in 2.12.2 of this document SHALL be implemented.

Scenario No 2

The User plans to pass the device on someone else, and so performs a factory reset, returning the device to out-of-box settings.

The new User inserts MNO-2 SIM. The TAD customisation SHALL be invoked according to MNO-2's requirements.

3 Settings

The following settings shown in Tables 1 to 7 SHALL always be part of a TAD customisation package.

The parameter/value type that is associated with that setting has been listed.

Default values for the setting have been recommended. These shall be used when deploying a generic TAD customisation, or when an MNO has not provided a specific value. Where no default values exist the OEM shall use their preferred value for this setting.

Therefore, when implementing a customisation the following priorities should be applied when selecting which setting is to be used, this is as defined in GSMA PRD TS.32 Annex A or the GSMA TS.36 Network Settings Exchange.

- Priority 1: MNO Recommended Value
- Priority 2: Where MNO recommended value is blank use TS.32 default Value
- Priority 3: Where both MNO recommended, and Default values are blank the OEM may use their preferred value

Settings which are defined in this document should not cause conflict with other regulation or mandatory specifications. If this is found to be the case then the specific settings impacted from this document may be disregarded.

The setting lists below are broken down by high level technology.

Each table contains the:

4. Setting name
5. Setting value option -
6. Default value (unless otherwise specified by an MNO)
7. Comment – additional notes for clarity

3.1 IMS Settings

IMS settings in Table 6 have been defined by GSMA UPG group. The IMS settings are related to the provision of Operator based communication services as defined in UPG PRDs IR.92 [2], IR.94 [5], IR.51 [6], NG.106 [7], NG.102 [8] & NG.114 [9]. The list of settings in this document represents UPG's advice on which parameters within its PRDs have optionality, and therefore need to be defined by the MNO. If a setting in any UPG PRD is not in this list then the value for that setting is clearly defined within the appropriate UPG PRD.

3.2 Access Point Name (APN)'s

TS.32 allows the capture of an MNOs APN details, these should be listed in Table 8, when listing an APN, the MNO SHALL provide the information detailed in Table 8 for each of the relevant APN type, these details are the minimum that should be supplied.

It is permissible to list multiple APN's, e.g. Default APN, MMS APN, Tethering APN, Event APN etc. This can be done by listing multiple supplementary APN's in Table 8.

An MNO SHALL indicate the type of APN in the 'APN Type' field e.g. whether it is a Default, MMS or Supplementary APN.

3.2.1 AOSP APN File

The GSMA notes that APN details for MNOs are also captured in the Android Open Source Project, which maintains a file listing APN's, it can be accessed from the link below;

https://android.googlesource.com/device/sample/+/master/etc/apns-full-conf.xml

The file can be updated by any AOSP contributor using normal processes for submission to the AOSP

The APN Settings Table below allows a MNO to indicate if this file also contains their APN information.

3.3 MNO Specific supplementary Settings

The TAD settings list has been defined by GSMA to provide a common group of settings which are always defined in a Late Customisation, However it is recognized that in some circumstances MNO's may have a requirement to define settings outside of this list.

If such settings are not configurable by the MNO using MNO Provisioning, then it is acceptable for the MNO to define a list of supplementary settings for inclusion in a Late Customisation. However the manufacturer will need to confirm to the MNO that they can configure these settings as they are outside the scope of the agreed TAD settings list

Such supplementary settings can be added using the Excel Template associated to this document, or using the process defined in TS.36.

Supplementary settings would use the same format as defined in this document, plus indicate which of the Technology Groupings it belongs to e.g. GSM, UTRA, HSPA, LTE, IMS, Other. The table header below shows the fields to be defined for these supplementary settings:

Index	Technology Group (e.g. GSM,HSPA,LTE, IMS)	Setting Name	Permissible Setting Value	Default Value	Additional Comment

It is recommended that supplementary settings should be kept to a minimum by any MNO. The MNO should take care not to include settings where the value is well defined in relevant specifications. MNO's should take care not to define settings which encourage deviation from relevant specifications.

3.4 Table 1 GSM Settings

Index	Setting Name	Permissible Setting Value	Default Value	Additional Comment
GSM 1.01	VOID			Index number no longer used.
GSM 1.02	VOID			Index number no longer used.
GSM 1.03	A5/1	Activate/Deactivate	Activate	See 3GPP 43.020 (section 4.9), 24.008 (sections 10.5.1.5, 10.5.1.6, 10.5.5.12a). Mandatory in 3GPP Rel-10
GSM 1.04	A5/3	Activate/Deactivate	Activate	See 1.04
GSM 1.05	A5/4	Activate/Deactivate	Activate	See 3GPP 43.020 (section 4.9), 24.008 (sections 10.5.1.5, 10.5.1.6, 10.5.5.12a)

Index	Setting Name	Permissible Setting Value	Default Value	Additional Comment
GSM 1.06	GEA1 Encryption	Activate/Deactivate	Deactivate	See 3GPP TS 43.020 V16.0.0 (section D.4.9) – prohibited to support in UEs from 3GPP Rel-12
GSM 1.07	GEA3 Encryption	Activate/Deactivate	Activate	See 3GPP TS 43.020 V16.0.0 (section D.4.9) – mandatory to support in UEs
GSM 1.08	GEA4 Encryption	Activate/Deactivate	Activate	See 3GPP TS 43.020 V16.0.0 (section D.4.9) – optional to support in UEs
GSM 1.09	VOID			Index number no longer used.
GSM 1.10	VAMOS Level	0,1,2	0	0 = off, 1 = VAMOS 1, 2 = VAMOS 1 +2 See 3GPP 45.001 (section 13.2) and 24.008 (section 10.5.1.7)
GSM 1.11	VOID			Index number no longer used.
GSM 1.12	GSM_AMR-Wideband	Activate/Deactivate	Activate	See 3GPP 26.103 (section 5.7) and 24.008 section 10.5.4.32
GSM 1.13	VOID			Index number no longer used.
GSM 1.14	Dual Transfer Mode	Activate/Deactivate	Activate	There are multiple capabilities associated with DTM (see 3GPP 43.055 section 4.6). “Deactivate” means that no DTM capabilities are to be indicated; “Activate” means one or more DTM capabilities may be indicated.
GSM 1.15	Randomized L2 fill bits in Uplink	Activate/Deactivate	Activate	See 3GPP 44.006, section 5.2. Use of this feature is mandatory from 3GPP Release 6.
GSM 1.16	GEA2 Encryption	Activate/Deactivate	Activate	

3.5 Table 2 UTRA Settings

Index	Setting Name	Permissible Setting Value	Default value	Additional Comments
UTRA 1.01	VOID			Index number no longer used.
UTRA 1.02	UEA1	Activate/Deactivate	Activate	
UTRA 1.03	UEA2	Activate/deactivate	Activate	
UTRA 1.04	UIA1	Activate/deactivate	Activate	
UTRA 1.05	UIA2	Activate/deactivate	Activate	
UTRA 1.06	VOID			Index number no longer used.
UTRA 1.07	UMTS-AMR-Wideband	Activate/deactivate	Activate	
UTRA 1.08	ROHC header compression	Activate/Deactivate	Deactivate	

	RFC4815 & RFC3095 for GSM			

3.6 Table 3 HSPA settings

Index	Setting Name	Permissible Settings Value	Default Value	Additional Comments
HSPA 1.01	VOID			Index number no longer used.
HSPA 1.02	3G to 2G PSHO	Activate/Deactivate	Deactivate	
HSPA 1.03	VOID			Index number no longer used.
HSPA 1.04	VOID			Index number no longer used.
HSPA 1.05	VOID			Index number no longer used.
HSPA 1.06	VOID			Index number no longer used.
HSPA 1.07	Dual Carrier / Dual Band	Activate/Deactivate	Deactivate	
HSPA 1.08	Dual Carrier HSDPA	Activate/Deactivate	Activate	
HSPA 1.09	Dual Carrier HSUPA	Activate/Deactivate	Deactivate	
HSPA 1.10	CPC DRX	Activate/Deactivate	Activate	
HSPA 1.11	CPC DTX	Activate/Deactivate	Activate	
HSPA 1.12	CPC HS SCCH less Operation	Activate/Deactivate	Activate	
HSPA 1.13	CPC UL Slot format 4	Activate/Deactivate	Activate	
HSPA 1.14	Enhanced Fractional DPCH	Activate/Deactivate	Activate	
HSPA 1.15	Enhanced Cell FACH DL	Activate/Deactivate	Deactivate	
HSPA 1.16	Enhanced Cell FACH UL	Activate/Deactivate	Deactivate	
HSPA 1.17	Improved Layer2 UL	Activate/Deactivate	Deactivate	
HSPA 1.18	Improved Layer2 DL	Activate/Deactivate	Activate	
HSPA 1.19	Enhanced UE DRX Capability	Activate/Deactivate	Deactivate	
HSPA 1.20	Fast Dormancy pre-R8	Activate/Deactivate	Deactivate	This behaviour is not specified by 3GPP
HSPA 1.21	VOID			Index number no longer used.
HSPA 1.22	Fast Dormancy R8	Activate/Deactivate	Activate	3GPP 25.331
HSPA 1.23	Fast Dormancy Rel.8 timer / display illumination = on	Value in seconds		3GPP specifications do not specify this behaviour. In case Fast Dormancy R8 is active and the display is On, Fast Dormancy is applied when the following condition is met: No data transfer for an application for a the specified time, whereby the

Index	Setting Name	Permissible Settings Value	Default Value	Additional Comments
				time interval can be longer when CPC DRX/DTX feature is configured
HSPA 1.24	Fast Dormancy Rel.8 timer / display illumination = off	Value in seconds		3GPP specifications do not specify this behaviour. In case Fast Dormancy R8 is active and the display is OFF, Fast Dormancy is applied when the following condition is met: No data transfer for an application for the specified time, whereby the time interval can be longer when CPC DRX/DTX feature is configured

3.7 Table 4 LTE Settings

Index	Setting Name	Permissible Setting Value	Default Value	Additional comments
LTE 1.01	Support of LTE DL Carrier Aggregation	Activate/Deactivate	Activate	
LTE 1.02	VOID			Index number no longer used.
LTE 1.03	VOID			Index number no longer used.
LTE 1.04	Inter-RAT PSHO LTE to GERAN	Activate/Deactivate	Deactivate	
LTE 1.05	R9 Redirection to GERAN	Activate/Deactivate	Activate	
LTE 1.06	R8 redirection w/ “skip non-mandatory SIBs”	Activate/Deactivate	Activate	
LTE 1.07	ISR - Idle Signalling Mode Reduction	Activate/Deactivate	Activate	
LTE 1.08	ESM_info_flag (EPS Session Management)	True/False	FALSE	
LTE 1.09	VOID			Index number no longer used.
LTE 1.10	Fast Return from 3G to LTE after CSFB	Activate/Deactivate	Activate	
LTE 1.11	VOID			Index number no longer used.
LTE 1.12	Fast Return from 2G to LTE after CSFB	Activate/Deactivate	Activate	
LTE 1.13	Voice / Data centric setting in attach message	Voice=1, Data=2		MNO must specify a value
LTE 1.14	Voice Domain Preference in attach message	0,1,2,3		See 3GPP TS 24.008 Table 10.5.166A
LTE 1.15	VOID			Index number no longer used.
LTE 1.16	3G -> LTE PS HO	Activate/Deactivate	Activate	
LTE 1.17	Force 3G/2G LU before CSFB emergency call	Activate/Deactivate		
LTE 1.18	R9 SON rach reporting	Activate/Deactivate		
LTE 1.19	Forbidden TA list expiry time	Value	24Hours	See 24.301, Section 5.3.2. Permitted range of 12 to 24 hours.

Index	Setting Name	Permissible Setting Value	Default Value	Additional comments
LTE 1.20	VOID			Index number no longer used.
LTE 1.21	FeICIC (Cell Reference Signal interference handling)	Activate/Deactivate	Deactivate	
LTE 1.22	TM9 (Transmission Mode) (with 8 CSI reference signal ports for FDD)	Activate/Deactivate	Activate	
LTE 1.23	TM10 (Transmission Mode)	Activate/Deactivate	Deactivate	
LTE 1.24	NAICS	Activate/Deactivate	Deactivate	
LTE 1.25	Minimisation of drive test	Activate/Deactivate	Activate	
LTE 1.26	UE-TxAntenna Selection Supported	Activate/Deactivate	Activate	
LTE 1.27	halfDuplex	Activate/Deactivate	Deactivate	
LTE 1.28	Transmission Mode 7 for FDD	Activate/Deactivate		
LTE 1.29	Transmission Mode 8 for FDD	Activate/Deactivate		
LTE 1.30	Cross carrier scheduling operation for CA for FDD	Activate/Deactivate		
LTE 1.31	VOID			Index number no longer used.
LTE 1.32	3G FGI1: 3G -> LTE (PCH Cell Reselection)	Activate/Deactivate	Activate	
LTE 1.33	3G FGI2: 3G -> LTE (measurement/reporting)	Activate/Deactivate	Activate	
LTE 1.34	3G FGI3: 3G -> LTE (CELL_FACH absolute priority cell reselection for high priority layers)	Activate/Deactivate	Deactivate	
LTE 1.35	3G FGI4: 3G -> LTE (CELL_FACH absolute priority cell reselection for all layers)	Activate/Deactivate	Deactivate	
LTE 1.36	2G -> LTE support in packet transfer mode	: 0,1,2,3 (or 00,01,11,12)	1	See 3GPP TS 24.008 section 10.5.5.12a 0=”none”, 1=”UE autonomous reselection”, 2=”CCO”, and predecessor 3=”PS HO” and predecessor. A device shall not set the capability indicator greater than the indicated setting.
LTE 1.37	VOID			Index number no longer used.
LTE 1.38	2G ->LTE PS HO	Activate/Deactivate	Deactivate	If 1.36 is set to 3 this setting must be Activate
LTE 1.39	2G -> LTE measurement/reporting	Activate/Deactivate	Activate	See 3GPP TS 45.008 (section 8.4.7). Reporting E-UTRAN frequencies is mandatory (based on network signalling) for 2G+LTE capable devices.

Index	Setting Name	Permissible Setting Value	Default Value	Additional comments
LTE 1.40	VOID			Index number no longer used.
LTE 1.41	Combined Attach in LTE for CSFB/SMS	PS+CS, PS+CS (SMS only), PS	PS+CS	CSFB is only possible if PS+CS is selected here and CSFB is supported by network
LTE 1.42	EEA0	Activate/Deactivate	Activate	3GPP 33.401 specification – only for emergency calls.
LTE 1.43	EEA1	Activate/Deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.44	EEA2	Activate/deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.45	EEA3	Activate/deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.46	EIA1	Activate/deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.47	EIA2	Activate/deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.48	EIA3	Activate/deactivate	Activate	As specified in 3GPP TS 33.401 specification
LTE 1.49	FeICIC (Synchronization Signal and common channel interference handling)	Activate/Deactivate	Deactivate	FeICIC (Synchronization Signal and common channel interference handling)
LTE 1.50	ROHC header compression	Activate/Deactivate	Activate (for VoLTE devices) De-activate (non-VoLTE devices)	Note it is mandatory for ROHC to be supported in LTE if VoLTE is activated, See GSMA IR.92 and 3GPP 36.523-2 specification

3.8 Table 5 LTE FGI Bits

Index of indicator (bit number) Index of indicator (bit number)	Setting Name - E-UTRA Capabilities - Feature Group Indicators	FDD - Setting Value	TDD - Setting Value	Default
1 (leftmost bit)	- Intra-sub frame frequency hopping for PUSCH scheduled by UL grant	Binary	Binary	
	- DCI format 3a (TPC commands for PUCCH and PUSCH with single bit power adjustments)			
	- Multi-user MIMO for PDSCH			
	- Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected sub band CQI without PMI			
	- Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected sub band CQI with multiple PMI			
2	- Simultaneous CQI and ACK/NACK on PUCCH, i.e. PUCCH format 2a and 2b	Binary	Binary	
	- Absolute TPC command for PUSCH			
	- Resource allocation type 1 for PDSCH			
	- Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 – UE selected sub band CQI without PMI			

Index of indicator (bit number) Index of indicator (bit number)	Setting Name - E-UTRA Capabilities - Feature Group Indicators	FDD - Setting Value	TDD - Setting Value	Default
	- Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 – UE selected sub band CQI with single PMI			
3	- 5bit RLC UM SN	Binary		
	- 7bit PDCP SN			
4	- Short DRX cycle	Binary	Binary	
5	- Long DRX cycle	Binary		
	- DRX command MAC control element			
6	- Prioritised bit rate	Binary		
7	- RLC UM	Binary		
8	- EUTRA RRC_CONNECTED to UTRA CELL_DCH PS handover	Binary	Binary	
9	- EUTRA RRC_CONNECTED to GERAN GSM_Dedicated handover	Binary	Binary	
10	- EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order	Binary	Binary	
	- EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order with NACC (Network Assisted Cell Change)			
11	- EUTRA RRC_CONNECTED to CDMA2000 1xRTT CS Active handover	Binary	Binary	
12	- EUTRA RRC_CONNECTED to CDMA2000 HRPD Active handover	Binary	Binary	
13	- Inter-frequency handover	Binary		
14	- Measurement reporting event: Event A4 – Neighbour > threshold	Binary		
	- Measurement reporting event: Event A5 – Serving < threshold1 & Neighbour > threshold2			
15	- Measurement reporting event: Event B1 – Neighbour > threshold	Binary	Binary	
16	- Periodical measurement reporting for non-ANR related measurements	Binary		
17	- Periodical measurement reporting for SON / ANR	Binary		
	- ANR related intra-frequency measurement reporting events			
18	- ANR related inter-frequency measurement reporting events	Binary		
19	- ANR related inter-RAT measurement reporting events	Binary	Binary	
20	If bit number 7 is set to ‘0’:	Binary		
	- SRB1 and SRB2 for DCCH + 8x AM DRB			
	If bit number 7 is set to ‘1’:			
	- SRB1 and SRB2 for DCCH + 8x AM DRB			
	- SRB1 and SRB2 for DCCH + 5x AM DRB + 3x UM DRB			
	NOTE: UE which indicate support for a DRB combination also support all subsets of the DRB combination. Therefore, release of DRB(s) never results in an unsupported DRB combination.			

Index of indicator (bit number) Index of indicator (bit number)	Setting Name - E-UTRA Capabilities - Feature Group Indicators	FDD - Setting Value	TDD - Setting Value	Default
21	- Predefined intra- and inter-sub frame frequency hopping for PUSCH with N_sb > 1	Binary		
	- Predefined inter-sub frame frequency hopping for PUSCH with N_sb > 1			
22	- UTRAN measurements, reporting and measurement reporting event B2 in E-UTRA connected mode	Binary	Binary	
23	- GERAN measurements, reporting and measurement reporting event B2 in E-UTRA connected mode	Binary	Binary	
24	- 1xRTT measurements, reporting and measurement reporting event B2 in E-UTRA connected mode	Binary	Binary	
25	- Inter-frequency measurements and reporting in E-UTRA connected mode	Binary		
26	- HRPD measurements, reporting and measurement reporting event B2 in E-UTRA connected mode	Binary	Binary	
27	- EUTRA RRC_CONNECTED to UTRA CELL_DCH CS handover	Binary	Binary	
		Binary	Binary	
28	- TTI bundling	Binary	Binary	
29	- Semi-persistent scheduling	Binary	Binary	
30	- Handover between FDD and TDD	Binary		
31	- Indicates whether the UE supports the mechanisms defined for cells broadcasting multi band information i.e. comprehending multiBandInfoList, disregarding in RRC_CONNECTED the related system information fields and understanding the EARFCN signalling for all bands, that overlap with the bands supported by the UE, and that are defined in the earliest version of TS 36.101 [42] that includes all UE supported bands.	Binary		
32	-Undefined			
33	Inter-RAT ANR features for UTRAN FDD including:	Binary	Binary	
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportStrongestCellsForSON*			
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportCGI*			
34	Inter-RAT ANR features for GERAN including:	Binary	Binary	
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportStrongestCells*	Binary	Binary	
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportCGI*			
35	Inter-RAT ANR features for 1xRTT including:	Binary	Binary	
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportStrongestCellsForSON*			
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportCGI*			
36	Inter-RAT ANR features for HRPD including:	Binary	Binary	

Index of indicator (bit number) Index of indicator (bit number)	Setting Name - E-UTRA Capabilities - Feature Group Indicators	FDD - Setting Value	TDD - Setting Value	Default
	- Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportStrongestCellsForSON* - Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportCGI*			
37	Inter-RAT ANR features for UTRAN TDD including: - Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportStrongestCellsForSON* - Inter-RAT periodical measurement reporting where *triggerType* is set to *periodical* and *purpose* is set to *reportCGI*	Binary	Binary	
38	EUTRA RRC_CONNECTED to UTRA TDD CELL_DCH PS handover, if the UE supports both UTRAN FDD and UTRAN TDD	Binary	Binary	
39	UTRAN TDD measurements, reporting and measurement reporting event B2 in E-UTRA connected mode, if the UE supports both UTRAN FDD and UTRAN TDD	Binary	Binary	
40	EUTRA RRC_CONNECTED to UTRA TDD CELL_DCH CS handover, if the UE supports both UTRAN FDD and UTRAN TDD	Binary	Binary	
41	Measurement reporting event: Event B1 – Neighbour > threshold for UTRAN FDD, if the UE supports UTRAN FDD and has set bit number 22 to 1	Binary	Binary	
101	DMRS with OCC (orthogonal cover code) and SGH (sequence group hopping) disabling	Binary		
102	Trigger type 1 SRS (aperiodic SRS) transmission (Up to X ports) NOTE: X = number of supported layers on given band	Binary	Binary	
103	PDSCH transmission mode 9 when up to 4 CSI reference signal ports are configured	Binary	Binary	
104	PDSCH transmission mode 9 for TDD when 8 CSI reference signal ports are configured	Binary		
105	Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 – UE selected sub band CQI without PMI, when PDSCH transmission mode 9 is configured Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 – UE selected sub band CQI with single PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured	Binary	Binary	
106	Periodic CQI/PMI/RI/PTI reporting on PUCCH: Mode 2-1 – UE selected sub band CQI with single PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	Binary	Binary	

Index of indicator (bit number) Index of indicator (bit number)	Setting Name - E-UTRA Capabilities - Feature Group Indicators	FDD - Setting Value	TDD - Setting Value	Default
107	Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected sub band CQI without PMI, when PDSCH transmission mode 9 is configured Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected sub band CQI with multiple PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured	Binary	Binary	
108	Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected sub band CQI with multiple PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	Binary	Binary	
109	Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, sub mode 1	Binary	Binary	
110	Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, sub mode 2	Binary	Binary	
111	Measurement reporting trigger Event A6	Binary	Binary	
112	SCell addition within the Handover to EUTRA procedure	Binary	Binary	
113	Trigger type 0 SRS (periodic SRS) transmission on X Serving Cells NOTE: X = number of supported component carriers in a given band combination	Binary	Binary	
114	Reporting of both UTRA CPICH RSCP and Ec/N0 in a Measurement Report	Binary		
115	Time domain ICIC RLM/RRM measurement sub frame restriction for the serving cell time domain ICIC RRM measurement sub frame restriction for neighbour cells time domain ICIC CSI measurement	Binary	Binary	
116	Relative transmit phase continuity for spatial multiplexing in UL	Binary	Binary	

3.9 Table 6 IMS Settings

Table 6 lists the IMS settings for the control of Operator based communication services.

NOTE : The index naming scheme “VxLTE” was originally chosen due to the parameters being defined in GSMA PRD IR.92 [2] for the VoLTE service. However, these parameters are generic IMS parameters are also equally applicable to the provision of Operator based communication services over other access types such as Wi-Fi and 5G-NR.

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
VxLTE1.01	VOID				Index number no longer used.
VxLTE1.02	VOID				Index number no longer used.
VxLTE1.03	VOID				Index number no longer used.
VxLTE1.04	VOID				Index number no longer used.
VxLTE1.05	ToConRef (Network Identifier part of the HOS APN)	String / Empty	Internet APN	LC & MNOP	Denotes the APN for XCAP Ut usage. If empty, then the APN is assumed to be the same as the APN for Internet access. See Section 5.9 of 3GPP Release 14 TS 24.424 (/<X>/XCAP_conn_params_policy/<X>/XDM_MO_ref) and 3GPP Release 14 TS 24.623.
VxLTE1.06	Conf_Factory_URI (Conference Factory URI)	String / Empty	Empty	LC & MNOP	Denotes the URI of the Conference Factory / SIP AS. If empty, the URI is derived from the IMSI - see 3GPP TS 23.003. Defined in section 5.4 of 3GPP TS 24.166 (/<X>/Conf_Factory_URI)
VxLTE1.07	SMS Over IP Networks Indication	SMSoIP Not Used / SMSoIP Preferred	1 - SMSoIP Preferred	LC & MNOP	See section 5.28 of 3GPP TS 24.167 (/<X>/SMS_Over_IP_Networks_Indication) This is applicable to Wi-Fi and cellular
VxLTE1.08	Timer_T1	Value	2 secs	LC & MNOP	Standard SIP timer - see 3GPP TS 24.229 sect 7.7and Section 5.10 of 3GPP TS 24.167 (/<X>/Timer_T1).
VxLTE1.09	Timer_T2	Value	16 secs	LC & MNOP	Standard SIP timer - see 3GPP TS 24.229 sect 7.7 Section 5.11 of 3GPP TS 24.167 (/<X>/Timer_T2).
VxLTE1.10	Timer_T4	Value	17 secs	LC & MNOP	Standard SIP timer - see 3GPP TS 24.229 sect 7.7 and Section 5.12 of 3GPP TS

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
					24.167 (/<X>/Timer_T3).
VxLTE1.11	RegRetryBaseTime	Value	30 secs	LC & MNOP	Base timer value for re-registration - see section 5.35 of 3GPP TS 24.167 (/<X>/ RegRetryBaseTime)
VxLTE1.12	RegRetryMaxTime	Value	1800 secs	LC & MNOP	Max timer value for re-registration - see Section 5.35 of 3GPP TS 24.167 (/<X>/ RegRetryMaxTime)
VxLTE1.13	Precondition_disabling_policy (SIP Preconditions used)	Activate/Deactivate	0 – the UE is allowed to use the precondition mechanism	LC & MNOP	Denotes whether SIP preconditions are used on the UE. See section 5.60 of 3GPP Release 14 TS 24.167 (/<X>/Precondition_disabling_policy) and 3GPP Release 14 TS 24.229.
VxLTE1.14	Ut Authentication	GAA/GBA/ Digest	GAA	LC	The authentication mechanism to be used for XCAP Ut authentication. See IR.92 section 2.2.2 (where use of GAA is optional)
VxLTE1.15	SS -Domain Setting	PS Only / CS Only / As voice service	no default	LC & MNOP	Denotes the method by which Supply Service control is enabled (i.e. via Ut or CS). See Section 5.41 3GPP TS 24.167 (/<X>/SS_domain_setting). If no preference is provided then the default behaviour of the device is PS Preferred
VxLTE1.16	USSD method	USSI/CSFB		LC	See PRD NG.101 & 3GPP TS 24.391.
VxLTE1.17	FromPreferred	"P-asserted-Id" header, "From" header	0 - From header field is not used for the orig. party identity in	LC & MNOP	Used to control the SIP header from which CLI display information is taken. See 3GPP Release 14 TS 24.607 and section 5.4 of 3GPP Release 14 TS 24.417

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
			OIP service		(/<X>/FromPreferred)not defined in 3GPP
VxLTE1.18	Default_EPS_bearer_context_usage_restriction_policy (Voice media on default (QCI=5) bearer)	Allow / Prohibit	Prohibit	LC & MNOP	Denotes whether voice media is permitted to use the IMS signalling bearer. See section 5.49 of 3GPP Release 14 TS 24.167 (interior node /<X>/Default_EPS_bearer_context_usage_restriction_policy) and 3GPP Release 14 TS 24.229.
VxLTE1.19	Default_EPS_bearer_context_usage_restriction_policy (Video media on default QCI=5 bearer)	Allow / Prohibit	Prohibit	LC & MNOP	Denotes whether video media is permitted to use the IMS signalling bearer. See section 5.49 of 3GPP Release 14 TS 24.167 (interior node /<X>/Default_EPS_bearer_context_usage_restriction_policy) and 3GPP Release 14 TS 24.229.
VxLTE1.20	XCAP Root URI	String / Empty	Empty	LC & MNOP	Denotes the ROOT URI for XCAP usage. If empty, then the URI is derived from the IMSI - see 3GPP TS 23.003. Defined in 3GPP TS 24.623.
VxLTE1.21	IMS Enabled	Yes/No	Yes	LC & MNOP	Denotes whether IMS is enabled on the UE. See section 5.13 of 3GPP TS 24.305 [18] as /<X>/IMS
VxLTE1.22	Policy_on_local_numbers (Local number type for voice and video calls)	Home-Local / Geo-Local	1 - Home-Local	LC & MNOP	Denotes the local numbering scheme to be used when roaming. See IR.92 section 2.2.3.2 and Section 5.62 of 3GPP Release 14 TS 24.167 (/<X>/ Policy_on_local_numbers)
VxLTE1.23	SMSoIP_usage_policy	Only with voice /	2-SMSoIP irrespectiv	LC & MNOP	Denotes whether SMSoIP can be used even if VoLTE is not

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
	(When to use SMSoIP)	Irrespective of voice	e of IMS voice support		used (VOPSI=No). See section 5.71 of 3GPP Release 14 TS 24.167 (/<X>/ SMSoIP_usage_policy)
VxLTE1.24	VoWiFi Mean Re-Keying timer	Value	18hrs	LC & MNOP	Timer to refresh security credentials associated with EPC integrated Wi-Fi. See Section 5.12A.3 of 3GPP Release 14 TS 24.312 (ANDSF/Untrusted_WLAN/RekeyingTime)
VxLTE1.25	VoWiFi NAT Keep-Alive Timer	Value	20 seconds	LC & MNOP	The timer to control sending of RTP keep alive packets when hosted NAT traversal encountered. See PRD IR51 & 3GPP TS 24.229 annex F5. Defined in section 5.12A.1 of 3GPP Release 14 TS 24.312 (ANDSF/Untrusted_WLAN/NATKeepAliveTime)
VxLTE1.26	VOID				Index number no longer used
VxLTE1.27	Media_type_restriction_policy (Voice / Video over LTE allowed when roaming)	Voice Only / Voice & Video / Neither	Voice & Video allowed	LC & MNOP	Denotes voice / video support over LTE when roaming. See section 5.43 of 3GPP Release 14 TS 24.167 (interior node /<X>/Media_type_restriction_policy) and 3GPP Release 14 TS 24.229.
VxLTE1.28	Media_type_restriction_policy (Voice / Video over LTE allowed)	Voice Only / Voice & Video / Neither	Voice & Video allowed	LC & MNOP	Denotes voice / video support over LTE when in home network (not roaming). See section 5.43 of 3GPP Release 14 TS 24.167 (interior node /<X>/Media_type_restriction_policy) and 3GPP Release 14 TS 24.229.

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
VxLTE1.29	PS Voice Preference Indicator	Cellular only/ Cellular preferred/ Wi-Fi_ only/ Wi-Fi_ preferred	no default	LC & MNOP	Selection & prioritisation between cellular technologies is out of scope of this specification
VxLTE1.30	PS Voice Preference Indicator when roaming	Cellular only/ Cellular preferred/ Wi-Fi_ only/ Wi-Fi_ preferred	no default	LC & MNOP	Selection & prioritisation between cellular technologies is out of scope of this specification
VxLTE 1.31	Sending SIP 18x reliably	Send 18x reliably / Do not send 18x reliably	1 – Indicates that the SIP 18x responses (other than SIP 183 response) are to be sent reliably	LC & MNOP	Section 5.56 of 3GPP Release 14 TS 24.167 (/<X>/ Reliable_18x_policy /<X>/ Send_18x_Reliably) and 3GPP Release 14 TS 24.229.
VxLTE 1.32	Access for XCAP	Any access/ 3GPP access only/ EPC via WLAN only/ direct WLAN / 3GPP access preferred, direct WLAN secondary/ 3GPP access preferred, EPC via WLAN secondary	1 - 3GPP Access Only	LC & MNOP	See 3GPP TS 24.424 and section 5.2.1.3 of 3GPP Release 14 TS 24.623 (/<X>/AccessForXCAP)
VxLTE 1.33	Rate Set for AMR	List of zero, one or more valid mode sets.	0,2,4,7 ("mode-set = 0,2,4,7" included in the	LC & MNOP	Defined in clause 15.2 of 3GPP Release 9 TS 26.114 (/<X>/Speech/<X>/RateSet) with (/<X>/Speech/<X>/Codec= "amr")

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
			SDP answer)		
VxLTE 1.34	Rate Set for AMR-WB	List of zero, one or more valid mode sets.	Undefined (no mode-set parameter included in the SDP answer)	LC & MNOP	Defined in clause 15.2 of 3GPP Release 9 TS 26.114 (/<X>/Speech/<X>/RateSet) (/<X>/Speech/<X>/Codec= "amr-wb")
VxLTE 1.35	EVS Bit Rate (EVS/br)	Range of bit rates for EVS codec	5.9-24.4	LC & MNOP	Defined in clause 15.2 of 3GPP Release 13 TS 26.114 (/<X>/Speech/<X>/EVS/Br) & and clause 5 of 3GPP Release 13 TS 26.441 [76] (Table 1)
VxLTE 1.36	EVS Bandwidth (EVS/Bw)	Range of bandwidths for EVS codec	nb-swb	LC & MNOP	Defined in clause 15.2 of 3GPP Release 13 TS 26.114 (/<X>/Speech/<X>/EVS/Bw)
VxLTE 1.37	EVS Initial partial redundancy offset (receive)	Denotes the frames used to transport partially redundant information in channel-aware mode. .	undefined (ch-aw-recv not included in SDP offer)	LC & MNOP	Defined in clause 17.2 of 3GPP Release 13 TS.26.114 /<X>/Speech/<X>/ICM/INIT_PARTIAL_REDUNDANCY_OFFSET_RECV
VxLTE1.38	XCAP PS Data Off Exempt	Not Exempt/ Exempt	1 - Indicates that the SS configuration via XCAP is a 3GPP PS data off exempt service	LC & MNOP	See Section 5.11 of 3GPP TS 24.424 (/<X>/3GPP_PS_data_off/SS_XCAP_config_exempt).
VxLTE1.39	MMTEL Voice PS Data Off Exempt	Not Exempt/ Exempt	1 - Indicates that the MMTEL voice is a	LC & MNOP	See section 5.7 of 3GPP TS 24.275 (/<X>/3GPP_PS_data

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
			3GPP PS data off exempt service		_off/MMTEL_voice_exempt)
VxLTE1.40	Device Management PS Data Off Exempt	Not Exempt/ Exempt	1 - Indicates that the device management is a 3GPP PS data off exempt service	LC & MNOP	See section 5.10i of 3GPP TS 24.368 (/<X>/3GPP_PS_data_off/Exempted_service_list/<X>/Device_management_over_PS)
VxLTE1.41	SMS over IP PS Data Off Exempt	Not Exempt/ Exempt	1 - Indicates that the SMS over IP is a 3GPP PS data off exempt service.	LC & MNOP	Section 5.67 of 3GPP TS 24.167 (/<X>/3GPP_PS_data_off/SMSoIP_exempt
VxLTE1.42	USSI_PS Data Off Exempt	Not Exempt/ Exempt	1 - Indicates that USSI is a 3GPP PS data off exempt service	LC & MNOP	Section 5.4B of 3GPP Release 14 TS 24.391 (/<X>/3GPP_PS_data_off/USSI_exempt)
VxLTE1.43	Emergency Registration Timer (emerg-reg)	Value	10 secs	LC & MNOP	Section 5.61 of 3GPP Release 14 TS 24.167 (/<X>/Timer_Emerg-reg)
VxLTE1.44	COMPOSER AUTH	Disabled/ MSRP Composer/ MMTEL Composer/ MMTEL & MSRP Composer	0 – Indicates that the service is disabled	LC & MNOP	Section 2.1.2 of RCC.20 (/<X>/Services/composerAuth) If the value “1” is configured and the UE only supports MMTEL Call Composer, the UE must behave as

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
					defined for a value of “0”. If the value “3” is configured and the UE only supports MMTEL Call Composer, the UE must behave as defined for a value of “2”.
VxLTE1.45	FT HTTP CS URI	String / Empty	Empty	LC & MNOP	Section A.2.4 of RCC.07 (/<X>/Messaging/FileTransfer/ftHTTPCSURI) If empty, the URI is derived from the IMSI as defined in section A.1.4 of RCC.07.
VxLTE1.46	FT HTTP DL URI	String / Empty	No default	LC & MNOP	Section A.2.4 of RCC.07 (/<X>/Messaging/FileTransfer/ftHTTPDLURI) If empty, the URI is received in the incoming message from the network.
VxLTE1.47	FT HTTP CS USER		No default	LC & MNOP	Section A.2.4 of RCC.07 (/<X>/Messaging/FileTransfer/ftHTTPCSUser) If used, this is a common N/W specific User ID. If empty, then GBA is used.
VxLTE1.48	FT HTTP CS PWD		No default	LC & MNOP	Section A.2.4 of RCC.07 (/<X>/Messaging/FileTransfer/ftHTTPCSPwd) If used, this is a common N/W specific password. If empty, then GBA is used.

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
VxLTE1.49	PRE AND POST CALL DATA OFF	Not Exempt/ Exempt	1 – indicates that Call Composer services are cellular data off exempt services	LC & MNOP	Section A.2.2 of RCC.07 (/<X>/Services/Ext/DataOff/preAndPostCallDataOff)
VxLTE1.50	CAPABILITY DISCOVERY MECHANISM	Options Based / Presence Based / Disabled	2 - Disabled	LC & MNOP	Section A.2.5 of RCC.07 (/<X>/CapDiscovery/defaultDisc)
VxLTE1.51	MMTEL Video PS Data Off Exempt	Not Exempt/ Exempt	0 - Indicates that MMTEL video is not a 3GPP PS data off exempt service	LC & MNOP	Section 5.8 of 3GPP Release 14 TS 24.275 (/<X>/3GPP_PS_data_off/MMTEL_video_exempt)
VxLTE1.52	Media_type_restriction_policy (Voice / Video over NR allowed when roaming on 5G Core)	Voice Only / Voice & Video / Neither	Voice & Video allowed	LC & MNOP	Denotes voice / video support over 5G when roaming. See section 5.43 & 5.48 of 3GPP TS 24.167 (interior node /<X>/Media_type_restriction_policy) and 3GPP Release 15 TS 24.229.
VxLTE1.53	Media_type_restriction_policy (Voice / Video over NR allowed)	Voice Only / Voice & Video / Neither	Voice & Video allowed	LC & MNOP	Denotes voice / video support over 5G when in home network (not roaming). See section 5.43 of 3GPP 24.167 (interior node /<X>/Media_type_restriction_policy) and 3GPP Release 15 TS 24.229.

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
VxLTE1.54	MMS Over WiFi	Activate/Deactivate	Activate	LC & MNOP	Only applicable for devices supporting VoWiFi
ViLTE2.01	VOID				Index number no longer used
VoWIFI 3.01	Voice and Video / Voice enabled over Wi-Fi	Neither / Voice only/ Voice & Video	Voice & Video enabled	LC & MNOP	Denotes whether voice/video enabled via EPC integrated Wi-Fi. See Section 5.43 of 3GPP Release 14 TS 24.167 (interior node /<X>/Media_type_restriction_policy) and 3GPP Release 14 TS 24.229
VoWIFI 3.02	Network Identifier part of the XCAP APN on EPC-integrated WLAN	Same APN as LTE/other APN / no APN (direct Wi-Fi)	No APN (i.e. use direct Wi-Fi access)	LC & MNOP	Denotes the APN to be used for XCAP usage when attached via EPC integrated Wi-Fi. See GSMA PRD IR.51 and section 5.9 of 3GPP Release 14 TS 24.424 (/<X>/XCAP_conn_params_policy/<X>/XDM_MO_ref) and 3GPP Release 14 TS 24.623
VoWIFI 3.03	Liveness check timer	Timer Value	2 Minutes	LC & MNOP	Liveness check timer (the absence of a network specified value). See IR,51 and section 5.12A.2 of 3GPP Release 14 TS 24.312 (ANDSF/Untrusted_WLAN/LivenessCheckPeriod)
VoWIFI 3.04	ePDG	String/ Empty	Empty	LC & MNOP	The ePDG to be used for emergency service. See IR.51 and section 5.11.11 of 3GPP Release 13 TS 24.312 (ANDSF/HomeNetworkPreference/ePDG)
VoWIFI 3.05	Allow_Handover of IMS PDN	HO with active session not	2 – Handover	LC & MNOP	The parameter applies to roaming case and is defined in section 5.78

Index	Setting Name	Setting Value	GSMA Default Value	Applicability (LC =Late Customization , MNOP = MNO Provisioning or TBD)	Comments
	connection from WLAN to LTE	allowed / HO with active session allowed/ HO not allowed	not allowed		of 3GPP Release 15 TS 24.167 (/<X>/Allow_Handover_PDN_connection_WLAN_and_EPS)
RCS 4.01	RCS VOLTE SINGLE REGISTRATION	0 - Dual, 1 - Single, 2- Singe at home, dual roaming	1	LC & MNOP	Denotes whether single / dual IMS registrations are needed for VoLTE / RCS services (i.e. single converged core or separate IMS cores - see PRD NG.102 & RCC.07 annex A.1.7
RCS 4.02	Operator Configuration Enabled	Enabled/ Disabled	Enabled	LC	Parameter allowing to disable the client-triggered RCS operator device configuration
RCS 4.03	RCS Operator Configuration Mechanism	HTTP(RCC.14)/OMA DM	HTTP(RCC.14)	LC	Controls the mechanism used for operator configuration

3.9.1 Table 6a Test Profiles

In order to streamline device testing a number of recommended settings (device service profiles) were defined in GSMA PRD IR.25 [10] and reflected in the associated UPG PRDs such as IR.92 [2] etc. Six such service oriented profiles were defined. Table 6a contains the suggested settings of each of the configuration parameters across the six profiles.

Parameter	Parameter Values					
	Voice over LTE Profile #1	Voice over LTE Profile #2	Voice & SMS over LTE Profile #3	Voice & SMS over LTE Profile #4	Voice & SMS over Wi-Fi Profile #5	Voice & SMS over WiFi Profile #6
VxLTE1.05 - ToConRef (Network Identifier part of the HOS APN)	HOS APN	Empty	HOS APN	Empty		
VxLTE1.06 - Conf_Factory_URI (Conference Factory URI)	Specific URI	Empty	Specific URI	Empty		

Parameter	Parameter Values					
	Voice over LTE Profile #1	**Voice over LTE Profile #2**	**Voice & SMS over LTE Profile #3**	**Voice & SMS over LTE Profile #4**	**Voice & SMS over Wi-Fi Profile #5**	**Voice & SMS over WiFi Profile #6**
VxLTE1.07 - SMS Over IP Networks Indication	SMSoIP Not Used				SMSoIP Preferred	
VxLTE1.08 - Timer_T1	2s					
VxLTE1.09 - Timer_T2	16s					
VxLTE1.10 - Timer_T4	17s					
VxLTE1.11 - RegRetryBaseTime	30s					
VxLTE1.12 - RegRetryMaxTime	1800s					
VxLTE1.13 - Precondition_disabling_policy (SIP Preconditions used)	Deactivate	Activate	Deactivate	Activate		
VxLTE1.14 - Ut Authentication	GAA	GBA	GAA	GBA		
VxLTE1.15 - SS Domain Setting	PS Only					
VxLTE1.16 - USSD Method	USSI					
VxLTE1.17 - FromPreferred	From	P-Asserted-ID	From	P-Asserted-ID		
VxLTE1.18 - Default_EPS_bearer_context_usage_restriction_policy (Voice Media on default (QCI=5) bearer)	Prohibit					
VxLTE1.19 - Default_EPS_bearer_context_usage_restriction_policy (Video Media on default (QCI=5) bearer)	Prohibit					
VxLTE1.20 - XCAP Root URI	Specific URI	Empty	Specific URI	Empty		
VxLTE1.21 IMS Enabled	Yes					
VxLTE1.22 - Policy_on_local_numbers (Local number type for voice and video calls)	Geo-Local	Home-Local	Geo-Local	Home-Local		
VxLTE1.23 - SMSoIP_usage_policy (When to use SMSoIP)	Only with voice					

Parameter	Parameter Values					
	Voice over LTE Profile #1	**Voice over LTE Profile #2**	**Voice & SMS over LTE Profile #3**	**Voice & SMS over LTE Profile #4**	**Voice & SMS over Wi-Fi Profile #5**	**Voice & SMS over WiFi Profile #6**
VxLTE1.24 - VoWiFi Rekeying Timer	18 hours					
VxLTE1.25 - VoWiFi NAT Keep Alive timer	20 secs					
VxLTE1.27 - Media_type_restriction_policy (Voice and/or Video over LTE allowed while roaming)	Voice Only		Voice & Video	Voice Only	Voice & Video	
VxLTE1.28 - Mean Media_type_restriction_policy (Voice and/or Video over LTE allowed)	Voice & Video			Voice Only	Voice & Video	
VxLTE1.29 - PreferredAccessNetworks (Voice over PS/WiFi Preference Indicator)	Cellular Only				Cellular Preferred	
VxLTE1.30 - PreferredAccessNetworks (Voice over PS/WiFi Preference Indicator when roaming)	Cellular Only				Cellular Preferred	WiFi Preferred
VxLTE1.31 - Reliable 18x policy (Sending SIP 18x reliably)	Do not send 18x reliably	Send 18x reliably	Do not send 18xreliably	Send 18x reliably		
VxLTE1.32- AccessForXCAP	3GPP Access Only	3GPP Access Preferred, EPC via WLAN Secondary	3GPP Access Only	3GPP Access Preferred, EPC via WLAN Secondary	Any access	
VxLTE1.33 - RateSet for AMR	0,2,4,7	Empty	0,2,4,7	Empty	0,2,4,7	Empty
VxLTE1.34 - RateSet for AMR-WB	Empty					
VxLTE1.35 - EVS/Br	9.6-24.4	Empty	9.6-24.4	Empty		
VxLTE1.36 - EVS/Bw	Empty	wb-swb	Empty	wb-swb	Empty	
VxLTE1.37 - EVS Initial partial redundancy offset (receive)	ch-aw-recv	undefined	ch-aw-recv	undefined		

Parameter	Parameter Values					
	Voice over LTE Profile #1	**Voice over LTE Profile #2**	**Voice & SMS over LTE Profile #3**	**Voice & SMS over LTE Profile #4**	**Voice & SMS over Wi-Fi Profile #5**	**Voice & SMS over WiFi Profile #6**
VxLTE1.38 - SS_XCAP_config_exempt	Exempt					
VxLTE1.39 - MMTEL_voice_exempt	Exempt					
VxLTE1.40 - Device_management_over_PS	Exempt					
VxLTE1.41 - SMSoIP_exempt	Not Exempt		Exempt			
VxLTE1.42 - USSI_exempt	Exempt					
VxLTE1.43 - Emergency Registration Timer (emerg-reg)	10s					
VxLTE1.44 - COMPOSER AUTH	MMTEL Composer	Disabled	MMTEL Composer	Disabled	MMTEL Composer	Disabled
VxLTE1.45 - FT HTTP CS URI	Empty					
VxLTE1.46 - FT HTTP DL URI	Empty					
VxLTE1.47 - FT HTTP CS USER	Empty					
VxLTE1.48 - FT HTTP CS PWD	Empty					
VxLTE1.49 - PRE AND POST CALL DATA OFF	Exempt	Not Exempt	Exempt	Not Exempt		
VxLTE1.50 - CAPABILITY DISCOVERY MECHANISM	Options Based	Disabled	Options Based	Disabled		
VxLTE1.51 - MMTEL_video_exempt	Exempt					
VoWIFi3.01 - Media_type_restriction_policy (Voice and/or video over WiFi enabled)	Neither				Voice & Video	
VoWiFi3.02 - ToConRef (Network Identifier part of the XCAP APN on EPC-integrated WLAN)	No APN	Same APN as LTE	No APN	Same APN as LTE	No APN	
VoWiFi3.03 - Liveness check timer in the absence of a network specified value (LivenessCheckPeriod)	2 mins					
VoWiFi3.04 - ePDG	Empty					

Parameter	Parameter Values					
	Voice over LTE Profile #1	Voice over LTE Profile #2	Voice & SMS over LTE Profile #3	Voice & SMS over LTE Profile #4	Voice & SMS over Wi-Fi Profile #5	Voice & SMS over WiFi Profile #6
VoWiFi3.05 - Allow_Handover_PDN_connection_WLAN_and_EPS	Handover Not Allowed					Handover with active session allowed
RCS 4.01 - RCS VoLTE Single Registration	1 -Single					
RCS 4.02 - Operator Configuration Enabled	Disabled					
RCS 4.03 - RCS Operator Configuration Mechanism	Empty					

3.10 Table 7 Other Settings

Index	Setting Name	Setting Value	Default Value	Additional comments
Other 1.01	VOID			Index number no longer used
Other 1.02	Supports IPv4	Activate/Deactivate	Activate	As specified in 3GPP TS 23.060
Other 1.03	Supports IPv4/6	Activate/Deactivate	Activate	As specified in 3GPP TS 23.060
Other 1.04	Supports IPv6	Activate/Deactivate	Activate	As specified in 3GPP TS 23.060
Other 1.05	464xLAT	Activate/Deactivate	Activate	
Other 1.06	SMS default alphabet	Activate/Deactivate	Activate	
Other 1.07	MTU size	Value		As specified in 3GPP TS 23.060
Other 1.08	TD-SCDMA	Activate/Deactivate		
Other 1.09	CDMA-2000	Activate/Deactivate		
Other 1.10	Fast higher priority PLMN search upon entering VPLMN	Activate/Deactivate	Activate	As specified in 23.122, 4.4.3.1.1
Other 1.11	VOID			Index number no longer used.
Other 1.12	VOID			Index number no longer used.
Other 1.13	VOID			Index number no longer used.
Other 1.14	Voice Mail Numbers	Numerical value	void	
Other 1.15	VOID			Index number no longer used.
Other 1.16	VOID			Index number no longer used.
Other 1.17	VOID			Index number no longer used.
Other 1.18	VOID			Index number no longer used.
Other 1.19	VOID			Index number no longer used.
Other 1.20	VOID			Index number no longer used.
Other 1.21	VOID			Index number no longer used.
Other 1.22	APN in EPC Initial Attach	No APN / APN name	No APN	As specified in 3GPP TS 24.301. Denotes whether an APN name when it is included in the initial attach. Furthermore, it is recommended that the default APN be the data APN (not always set to INTERNET) - If the MNO is setting a value they must state the actual APN name.
Other 1.23	VOID			Index number no longer used.

3.11 Table 8 APN Settings

Index	APN Purpose	Setting Name	Setting Value	Default Value	Additional comments
APN1.01	Default APN	APN name	String	Void	Text Label to identify APN
APN1.02		APN	String	Void	As specified in 3GPP TS 23.060
APN1.03		Authentication	PAP, CHAP, Normal	Void	As specified in 3GPP TS 23.060
APN1.04		Username	String	Void	As specified in 3GPP TS 23.060
APN1.05		Password	String	Void	As specified in 3GPP TS 23.060
APN1.06		APN Type	default, supl, mms and wap	default	As specified in 3GPP TS 23.060
APN1.07		Gateway / Proxy server IP address	IP Address	Void	As specified in 3GPP TS 23.060
APN1.08		Gateway / Proxy server port number	Number	Void	As specified in 3GPP TS 23.060
APN1.09		APN Protocol	IPV4. IPV6, IPV4/v6	IPV4	
APN1.10	MMS APN	APN name	String	Void	Text Lable to identify APN
APN1.11		MMS APN	String	Void	As specified in 3GPP TS 23.140 Annex F
APN1.12		Username	String	Void	As specified in 3GPP TS 23.060
APN1.13		Password	String	Void	As specified in 3GPP TS 23.060
APN1.14		MMSC URL	String	Void	As specified in 3GPP TS 23.140 Annex F
APN1.15		APN Type	default, supl, mms and wap	MMS	As specified in 3GPP TS 23.060
APN1.16		MMS proxy address (if applicable)	String	Void	As specified in 3GPP TS 23.140 Annex F
APN1.17		MMSC Port Number	Integer	Void	As specified in 3GPP TS 23.140 Annex F
APN1.18	Supplementary APN 1	APN name	String	Void	Text Label to identify APN
APN1.19		APN	String	Void	As specified in 3GPP TS 23.060
APN1.20		Authentication	PAP, CHAP, Normal	Void	As specified in 3GPP TS 23.060
APN1.21		Username	String	Void	As specified in 3GPP TS 23.060
APN1.22		Password	String	Void	As specified in 3GPP TS 23.060

Index	APN Purpose	Setting Name	Setting Value	Default Value	Additional comments
APN1.23		APN Type	default, supl, mms and wap	Void	As specified in 3GPP TS 23.060
APN1.24		Gateway / Proxy server IP address	IP Address	Void	As specified in 3GPP TS 23.060
APN1.25		Gateway / Proxy server port number	Number	Void	As specified in 3GPP TS 23.060
APN1.26		APN Protocol	IPV4. IPV6, IPV4/v6	IPV4	
APN1.27	AOSP Reference	MNO confirms Android device can use AOSP APN file as alternate resource for APN details	Yes/No	Yes	https://android.googlesource.com/device/sample/+/master/etc/apns-full-conf.xml

3.12 Table 9 5G Settings

Index	Setting Name	Permissible Setting Value	Default Value	Comments
5G 1.01	5G	Activate/Deactivate	Activate	
5G 1.02	NSA mode	Activate/Deactivate	Activate	
5G 1.03	SA mode	Activate/Deactivate	Activate	
5G 1.04	5G Roaming	SA / NSA / SA+NSA / Deactivate	Deactivate	
5G 1.05	Frequency Range 1 (FR1)	Activate/Deactivate	Activate	
5G 1.06	Frequency Range 2 (FR2)	Activate/Deactivate	Activate	
5G 1.07	NR DL Carrier Aggregation	Activate/Deactivate	Activate	
5G 1.08	NR UL Carrier Aggregation	Activate/Deactivate	Activate	
5G 1.09	FR1 – FR2 Carrier Aggregation	Activate/Deactivate	Activate	
5G 1.10	4G-5G Dynamic Spectrum Sharing (DSS)	Activate/Deactivate	Activate	
5G 1.11	Split bearer in NSA	DL / UL / DL+UL	DL+UL	
5G 1.12	Bandwidth part	Activate/Deactivate	Activate	
5G 1.13	VOID			Replaced by 5G 1.30 & 5G 1.31
5G 1.14	VOID			Replaced by 5G 1.32 & 5G 1.33

Index	Setting Name	Permissible Setting Value	Default Value	Comments
5G 1.15	VOID			Replaced by 5G 1.34 & 5G 1.35
5G 1.16	VxNR	VxNR/VxLTE fallback	VxLTE fallback	If IMS services are enabled in 5G, the detailed settings from Table 6 shall apply.
5G 1.17	VxNR roaming	VxNR/VxLTE fallback	VxLTE fallback	If IMS services are enabled in 5G, the detailed settings from Table 6 shall apply.
5G 1.18	VxNR <> VxWiFi mobility	Activate/Deactivate	Deactivate	
5G 1.19	VxNR <> VxLTE mobility	Activate/Deactivate	Deactivate	
5G 1.20	Fast return to 5G after VxLTE call	Activate/Deactivate	Activate	Signalled in RRC release
~~5G 1.20~~ Duplicated ref	~~NEA0 (emergency calls)~~	~~Activate/Deactivate~~	~~Deactivate~~	~~3GPP TS 33.401~~
5G 1.21	128-NEA1 (SNOW)	Activate/Deactivate	Activate	3GPP TS 33.401
5G 1.22	128-NEA2 (AES)	Activate/Deactivate	Activate	3GPP TS 33.401
5G 1.23	128-NEA3 (ZUC)	Activate/Deactivate	Deactivate	3GPP TS 35.222
5G 1.24	128-NIA1 (SNOW)	Activate/Deactivate	Activate	3GPP TS 33.401
5G 1.25	128-NIA2 (AES)	Activate/Deactivate	Activate	3GPP TS 33.401
5G 1.26	128-NIA3 (ZUC)	Activate/Deactivate	Deactivate	3GPP TS 35.222
5G 1.27	VOID			Index number no longer used
5G 1.28	VOID			Index number no longer used
5G 1.29	FR1 – FR2 Dual Connectivity	Activate/Deactivate	Deactivate	
5G 1.30	Maximum power class (NSA FR1 TDD)	1 / 1.5 / 2 / 3		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.
5G 1.31	Maximum power class (SA FR1 TDD)	1 / 1.5 / 2 / 3		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.

Index	Setting Name	Permissible Setting Value	Default Value	Comments
5G 1.32	Maximum power class (NSA FR1 FDD)	1 / 1.5 / 2 / 3		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.
5G 1.33	Maximum power class (SA FR1 FDD)	1 / 1.5 / 2 / 3		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.
5G 1.34	Maximum power class (NSA FR2 TDD)	1 / 2 / 3 / 4 / 5 / 6 / 7		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.
5G 1.35	Maximum power class (SA FR2 TDD)	1 / 2 / 3 / 4 / 5 / 6 / 7		There may be different maximum power classes permitted for different device types and bands according to local regulatory requirements which vendors shall adhere to.
5G 1.36 (Was 5G 1.20 Duplicated Ref)	NEA0 (emergency calls)	Activate/Deactivate	Deactivate	3GPP TS 33.401. NEA0 shall be used for unauthenticated emergency calls, irrespective of the setting value.

4 Accessing preferred MNO values for Settings and parameters

The TAD customisation shall be implemented by OEM's for their Late Customisation deployments.

MNO's and MVNO's are requested to record their preferred values in the GSMA Network Settings Exchange, which is defined in TS.36

If an MNO or MVNO has not entered their data into the Network Settings Exchange then the OEM shall establish a bilateral agreement for the MNO or MVNO to send them their settings, for this purpose it is recommend that the template provided in **Annex A** of this document is used. This includes a column for MNO recommended Value.

If an MNO/MVNO settings are not available within the GSMA Network Settings Exchange or via bilateral agreement, then the manufacturer SHOULD use the default values to deploy a generic TAD customisation package, where no default values exist the OEM SHOULD use their preferred value for this setting.

For each set of preferred values, the MNO's and MVNO's are requested to select all the equipment types (see GSM TS.06 [11]) these preferred values apply to. More than one set of values can be provided but an equipment type can only be indicated at most on one set of preferred values.

Annex A Settings List template

Use the following Excel template when and OEM requests and MNO or MVNO to bilaterally provide the values for TAD setting.



TS.32%20v14.0%20T
echnical%20Adaptatic

Annex B Document Management

B.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	13th July 2016	New PRD TS.32	PSMC #146	Doug Roberts / Orange
2.0	24 March 2017	Changes implemented as per CR1002	TSG at TSG#27	Doug Roberts / Orange
3.0	Sept 2017	Changes implemented as per CR1003	TSG at TSG#29	Doug Roberts / Orange
4.0	Sept 2018	Changes implemented as per CR1004	TSG	Doug Roberts / Orange
5.0	Oct 2019	Changes implemented as per CR1005	TSG	Paul Gosden / GSMA
6.0	Dec 2019	Changes implemented as per CR1006	TSG#38	Paul Gosden / GSMA
7.0	April 2020	Changes implemented as per CR1007	TSG - email	Tyler Smith/ GSMA
8.0	July 2020	Changes implemented as per CR1008	TSG - email	Paul Gosden / GSMA
9.0	Jan 2021	Changes implemented as per CR1010	TSG - email	Paul Gosden / GSMA
9.1	Jan 2021	Changes implemented as per CR1011	TSG - email	Paul Gosden / GSMA
10.0	Sept 2021	Changes implemented as per CR1012	TSG#45 ISAG#12	Paul Gosden / GSMA
11.0	May 2022	Changes implemented as per CR1013	TSG via email ISAG#20	Richard Ormson / 3UK
12.0	Feb 2023	Changes implemented as per CR1014	TSG#50 ISAG#27	Wayne Cutler / GSMA
13.0	July 2023	Changes implemented as per CR1015	TSG#52 ISAG#32	Laura White Telstra
14.0	Oct 2023	Changes implemented as per CR1016	TSG#52 ISAG#34	Mungal Dhanda / Qualcomm

B.2 Other Information

Type	Description
Document Owner	Terminal Steering Group
Editor / Company	Paul Gosden / GSMA

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at prd@gsma.com with your comments or suggestions & questions.