Telecommunications Standards Advisory Committee (TSAC)

Technical Specification

Cellular Mobile Terminal

Draft IMDA TS CMT
Issue 1 Rev 2, August 2020

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Content

Technical Specification for Cellular Mobile Terminal

1 Scope

This Specification defines the minimum technical requirements for Cellular Mobile Terminal (termed "CMT" in this Specification) to be used in the Public Mobile Radio Communication System and services which employ:

(a) ITU IMT-2000 radio interface technologies (UTRA FDD and E-UTRA FDD) identified in ITU-R M.1457-14, and transposed from 3GPP Release 8 and 9;

(b) ITU IMT-Advanced radio interface technologies (LTE-Advanced) identified in ITU-R M.2012-4, and transposed from 3GPP Release 10 and beyond;

(c) LTE-Advanced technology series from 3GPP Release 13 onwards, marked with LTE-Advanced Pro; and

(d) ITU IMT-2020 radio interface technologies (5G NR) identified in ITU-R M.2412-0, and transposed from 3GPP Release 15 and beyond.

CMTs may include handheld, portable and vehicle-mounted equipment, and RF interface cards and modems.

Note: CMTs' support of the Global System for Mobile Communications (GSM[1]) technology is no longer required after 31 March 2017.

2 References

For the technical requirements captured in this Specification, reference has been made to the following standards. Where versions are not indicated, implementation of this Specification shall be based on current and valid versions of these standards published by the respective Standards Development Organisations[2].

[1] ETSI EN 301 908-1: IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements

[2] ETSI EN 301 908-2: IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)

[3] ETSI EN 301 908-13: IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)

[4] ETSI EN 301 489-1: EMC standard for radio equipment and services; Part 1: Common technical requirements

[5] ETSI EN 301 489-52: Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment

[6] ITU-R M.1457-14: Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)

[7] ITU-R M.2012-4: Detailed specifications of the terrestrial radio interfaces of International Mobile

[1] Support for the GSM RIT according to the ETSI EN 301 511 for mobile stations in the GSM900 and GSM1800 bands has ceased after 31 March 2017.

[2] Implementers of these ETSI standards should check with the ETSI Web Server (http://ipr.etsi.org) whether Intellectual Property Rights have been declared to ETSI.

Telecommunications-Advanced (IMT-Advanced)

[8] ITU-T K.116: EMC requirements and test methods for radio telecommunication terminal equipment

[9] IEC CISPR 32: Electromagnetic compatibility of multimedia equipment – Emission requirements

[10] IEC CISPR 35: Electromagnetic compatibility of multimedia equipment – Immunity requirements

[11] ISO 7637-2: Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only

[12] CENELEC EN 50360: Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 6 GHz)

[13] IEC/EN 62209-1: Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)

[14] CENELEC EN 50566: Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz: hand-held and body mounted devices in close proximity to the human body

[15] IEC/EN 62209-2: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

[16] IEC TR 63170: Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz

[17] IEC 60950-1: Information technology equipment – Safety – Part 1: General requirements

[18] IEC 62368-1: Audio/video, information and communication technology equipment – Part 1: Safety requirements

[19] ETSI TS 138 521-1: 5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Range 1 Standalone

[20] ETSI TS 138 521-2: 5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Range 2 Standalone

[21] ETSI TS 138 521-3: 5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios

[22] ETSI TS 138 508-1: 5G; 5GS; User Equipment (UE) conformance specification; Part 1: Common test environment

[23] Draft ETSI EN 301 908-25: IMT cellular networks; Harmonized Standard for access to radio spectrum; Part 25: New Radio (NR) User Equipment (UE)

[24] ITU-R M2412-0: Guidelines for evaluation of radio interface technologies for IMT-2020.

[25] 3GPP TS.23.003: Technical Specification Group Core Network and Terminals; Numbering, addressing and identification

3 Abbreviations[3]

3GPP	3rd Generation Partnership Project
AC	Alternating Current
CA	Carrier Aggregation
CENELEC	European Committee for Electrotechnical Standardization
CDMA	Code Division Multiple Access
CISPR	International Special Committee on Radio Interference of the IEC
CMT	Cellular Mobile Terminal
DC	Direct Current
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMS	Electromagnetic Sustainability
EN	European Standard
ETSI	European Telecommunications Standards Institute
E-UTRA	Evolved Universal Terrestrial Radio Access (also known as LTE)
FDD	Frequency Division Duplex
FR	Frequency Range
GSM	Global System for Mobile communications
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICT	Information and Communications Technology
IEC	International Electrotechnical Commission
IMEI	International Mobile Station Equipment Identity
IMEISV	International Mobile Station Equipment Identity Software Version number
IMT	International Mobile Telecommunications
ISO	International Organization for Standardization
ITU	International Telecommunication Union
ITU-T	ITU Telecommunication Standardization Sector
LTE	Long Term Evolution (also known as E-UTRA)
NR	New Radio
PEI	Permanent Equipment Identifier
RF	Radio Frequency
RIT	Radio Interface Technology
SAR	Specific Absorption Rate
SDO	Standards Development Organisation
SELV	Safety Extra-Low Voltage
TDD	Time Division Duplex
UTRA	Universal Terrestrial Radio Access (UTRA FDD also known as WCDMA)
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network

[3] 3GPP™ and LTE™ are Trade Marks registered by ETSI for the benefit of its Members and 3GPP Organizational Partners.

4 General Requirements

4.1 International Mobile Station Equipment Identity or Permanent Equipment Identity

Each individual CMT shall be allocated a unique International Mobile Station Equipment Identity (IMEI); or Permanent Equipment Identity (PEI) in the IMEI format or international Mobile Station Equipment Identity and Software Version number (IMEISV) format. Manufacturer shall ensure that adequate security measures have been taken to protect the IMEI or PEI against duplication, unauthorised removal or change.

4.2 Keypad

Any keypad used in the CMT shall be alphanumeric and the relationships between digits, letters and symbols shall comply with the ITU-T Recommendation E.161 (02/2001), sections 2.2, 3.1.1 and 3.6.

4.3 Radio Frequency Electromagnetic Field (RF EMF) Safety : SAR and Power Density Requirements

4.3.1 Manufacturers or suppliers shall demonstrate that the CMT has been tested and certified for conformity with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) recommendations: CENELEC EN 50360 [12], IEC/EN 62209-1 [13], CENELEC EN 50566 [14] and IEC/EN 62209-2[4] [15]. Where operating frequencies are above 6GHz, IEC TR 63170 [16][5] will be used.

4.3.2 Compliance with the specified RF EMF safety standards does not by itself confer immunity from legal obligations and requirements imposed by national health or safety authorities. IMDA may invalidate the equipment registration if so requested by the relevant authority for reasons of safety or hazards that would likely be caused to users.

4.3.3 Where applicable, the equipment supplier shall provide the SAR and/or power density information in printed form or in other appropriate form such as in the user guide or as a leaflet or brochure in the equipment package. Furthermore, the supplier shall provide each unit of approved CMT with advisory information pertaining to electrical safety and non-ionising radiation hazards and on the safe operation of the CMT at potentially hazardous areas such as in moving vehicles, in aircrafts and at fuel depots, chemical plants and blasting sites.

4.4 Electromagnetic Compatibility (EMC) and Equipment Safety Requirements

4.4.1 EMC assessment

For EMC assessment, the CMT and/or ancillary equipment shall be classified as equipment for vehicular use (i.e. mobile terminal connected with vehicular charger or DC supply); or equipment for portable/mobile use (i.e. powered by its integral battery). This equipment classification is used to determine the applicability of the EMC (emission and immunity) testing requirements based on §7 of ETSI EN 301 489-1 [4]; or §7.5 and §9 of ITU-T K.116 [8]. The ETSI EN 301 489-1 [4] standard shall be used in conjunction with the ETSI EN 301 489-52 [5] standard for CMT that supports the UTRA, E-UTRA RITs and 5G RITs.

4.4.1.1 EMI or emission measurements

(a) Radiated emissions from associated ancillary equipment not incorporated in the CMT shall be measured to Class B requirements defined in §5 and Tables A.4 and A.5 of CISPR 32 [9], or §8.2 of EN 301 489-1 [4].

(b) Conducted emission at the DC power port of the CMT intended for vehicular use, shall be measured according to §8 of ETSI EN 301 489-1 [4].

(c) Conducted emission at the AC mains port shall be measured for CMT with dedicated charger or adapter [4] to Class B requirements defined in §5 and Table A.10 of CISPR 32 [9]. Equipment with DC power port which is powered by a dedicated AC/DC power converter is defined as AC

[4] At the time of this publication, IEC/IEEE 62209-1528 is being drafted. This could be accepted in place of IEC 62209-1 and IEC 62209-2 should a stable version be available.

[5] At the time of this publication, IEC/IEEE 63195 is being drafted. The stable version will be required for compliance should it be available.

mains powered equipment (§3.1.1 [9]).

Note: If CMT is a module intended to be marketed and sold separately from a host, it shall be assessed with at least one representative host system. Modules may be internal, mounted, plug-in or external (§6.2 of CISPR 32 [9]).

4.4.1.2 EMS or immunity testing

The following immunity tests may be performed on the CMT to requirements defined in CISPR 35 [10], §11 of ITU-T K.116 [8] or §9 of EN 301 489-1 [4], where applicable:

(a) RF electromagnetic field (80 MHz to 6 GHz) at the enclosure of the equipment

(b) Electrostatic discharge at the enclosure of the equipment

(c) Fast transients (common mode) at DC power and AC main power ports that have cables longer than 3 m

(d) RF common mode 0.15 MHz to 80 MHz at DC power and AC mains power ports that have cables longer than 3 m

(e) Transients and surges (vehicular environment) on nominal 12V and 24V DC supply voltage input ports of mobile terminal and ancillary equipment intended also for mobile use in vehicles [11]

(f) Voltage dips and interruptions at AC mains power port of mobile or portable terminal with dedicated charger/power adapter [4]

(g) Surges, common and differential mode at AC mains power port of mobile or portable terminal with dedicated charger/power adapter [4]

4.4.2 Equipment safety testing [6]

4.4.2.1 Equipment safety testing or assessment shall be performed to requirements defined in IEC 60950-1 [17] or IEC 62368-1 [18], based on the following assumptions:

(a) CMT is powered by a dedicated external power supply (charger/power adapter); and

(b) CMT operates with SELV in environments where overvoltage from telecommunication networks is not possible. SELV refers to voltages not exceeding 42.4 V peak or 60 V DC.

4.4.2.2 For CMT safety assessment performed with the hazard-based approach, the processes defined in IEC 62368-1 [18] shall be used:

(a) Identify energy sources in the CMT;

(b) Classify energy sources (effect on the body or combustible material, e.g. possibility of injury or ignition);

(c) Identify safeguards for protection against energy sources; and

(d) Consider the effectiveness of safeguards with respect to compliance criteria or requirements defined in the IEC 62368-1 [18] standard.

[6] Equipment safety testing performed to the IEC 60950-1 or the IEC 62368-1 safety standard is required, as recommended by Enterprise Singapore, the Safety Authority.

5 Technical Requirements

5.1 Operating Frequencies

5.1.1 The CMT shall operate within the frequency bands given in Table1.

Table 1: CMT Operating Frequency Bands

UTRA FDD Band	E-UTRAN Band	NR Band	Direction of Transmission	Frequency Range
I	1	n1	Transmit	1920 MHz – 1980 MHz
			Receive	2110 MHz – 2170 MHz
III	3	n3	Transmit	1710 MHz – 1785 MHz
			Receive	1805 MHz – 1880 MHz
VII	7	n7	Transmit	2500 MHz – 2570 MHz
			Receive	2620 MHz – 2690 MHz
VIII	8	n8	Transmit	880 MHz – 915 MHz
			Receive	925 MHz – 960 MHz
-	38	n38	Transmit and Receive	2570 MHz – 2620 MHz
-	40	n40	Transmit and Receive	2300 MHz – 2400 MHz
-	-	n77	Transmit and Receive	3300 MHz – 4200 MHz
-	-	n78	Transmit and Receive	3300 MHz – 3800 MHz
-	-	n257	Transmit and Receive	26500 MHz – 29500 MHz
-	-	n258	Transmit and Receive	24250 MHz – 27500 MHz
-	-	n261	Transmit and Receiver	27500 MHz – 28350 MHz

5.1.2 The precise operating frequency range of a CMT shall follow that of the Network Operator from whom the service is obtained.

5.2 Radio Interface Requirements

5.2.1 Manufacturers or suppliers shall demonstrate that the CMTs have been tested and certified for operating in the frequency bands stated in clause 5.1.1, and conformity to any or a combination of standards given in Table 2. The CMT shall comply with the applicable requirements specified in these standards, in addition to the requirements identified in the ETSI EN 301 908-1 [1], TS 138 521-1 [19], TS 138 521-2 [20] and TS 138 521-3 [21] (if CMT supports 5G NR) for compliance by the CMT.

Table 2: IMT RITs in EN 301 908 [1] and the Standards Parts for CMT

IMT-2000 / IMT-Advanced / IMT-2020 terrestrial RIT	RIT name in SDO	Reference SDO	EN 301 908 / TS 138 521 Part
IMT-2000 CDMA Direct Spread	UTRA FDD	ETSI (3GPP)	EN 301 908-2 [2]
LTE-Advanced	E-UTRA	ETSI (3GPP)	EN 301 908-13 [3]
IMT-2020	5G NR	ETSI (3GPP)	TS 138 521-1 [19] , TS 138 521-2 [20] and TS 138 521-3 [21] See note[7]

[7] At the time of this publication, EN 301 908-25 is being drafted. The stable version shall be used in place of ETSI TS 138 521-1 [19], ETSI TS 138 521-2 [20] and ETSI TS 138 521-3 [21], when it becomes available.

5.2.2 If the CMT also supports other wireless modes of operation such as WLAN, Bluetooth, suppliers shall demonstrate that the mobile terminal has been tested and certified for conformity to the relevant requirements as given in IMDA Technical Specification for Short Range Devices ("IMDA TS SRD").

Annex A

CMT Conformance Testing / Verification Checklist

This Checklist is intended for facilitating Supplier's Declaration of Conformity to the requirements defined in the IMDA Technical Specification for Cellular Mobile Terminals ("IMDA TS CMT").

Please note:

"**CR**" indicates that the general or technical requirement set out in a particular section or sub-section ("§") of the IMDA TS CMT is a **Compliance Requirement**.

"**M**" means that it shall be **Mandatory** for the CMT to comply with the requirement set out in the IMDA TS CMT § cited in this Checklist (Table given below).

"**C**" means that compliance with the technical requirement set out in the IMDA TS CMT § cited in this Checklist is **Conditional**. In this case, the need to comply is contingent on the type of CMT, RIT and application indicated in the remarks column.

"**V**" means that compliance with the requirement is **Voluntary**.

"NA" means that the requirement is **Not Applicable**.

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
1	IMT-2000 / IMT-Advanced / LTE-Advanced / LTE-Advanced Pro / IMT-2020 RITs	ITU-R M.1457-14 [6], M.2012-4 [7], and ITU-R M.2412-4 [24] of 3GPP release 15 and beyond	M		State the type of CMT (examples given in §1 of this Spec).
4.1	International Mobile Station Equipment Identity (IMEI); or Permanent Equipment Identity (PEI) in the IMEI format or international Mobile Station Equipment Identity and Software Version number (IMEISV) format		M		See [25] for more information on PEI
4.2	Keypad	ITU-T E.161	C		
4.3	RF EMF safety (SAR; power density) requirements	[12], [13], [14], [15] and [16]	C		[12], [13], [14] and [15] to be used for operating frequencies < 6GHz; else use [16]
4.4	EMC and safety requirements		-	-	
4.4.1	EMC assessment		-	-	
4.4.1.1 (a)	Radiated emissions	Tables A.4 and A.5 [9]; or §8.2 [4]	C		Applicable to ancillary equipment not incorporated in the radio equipment
4.4.1.1 (b)	Conducted emission: DC power port	§8.3 [4]	C		Applicable to CMT for vehicular use (regardless of DC cable length)
4.4.1.1 (c)	Conducted emission: AC mains power port	Table A.10 [9]; or §8.4 [4]	C		Applicable to CMT with dedicated charger/power adapter
4.4.1.2 (a)	RF electromagnetic field (80 MHz to 6 GHz)	Table 1 [10]; or §9.2 [4]	V		
4.4.1.2 (b)	Electrostatic discharge	Table 1 [10]; or §9.3 [4]	V		
4.4.1.2 (c)	Fast transients common mode	Table 2 [10]; Table 3 [10]; Table 4 [10]; or §9.4 [4]	V		Applicable to CMT with dedicated charger/power, and DC power port with cable longer than 3 m
4.4.1.2 (d)	RF common mode 0.15 MHz to 80 MHz	Table 2 [10]; Table 3 [10]; Table 4 [10]; or §9.5 [4]	V		
4.4.1.2 (e)	Transients and surges, vehicular environment	§9.6 [4]; or ISO 7637-2 [11]	V		Applicable to CMT intended for mobile use in vehicles
4.4.1.2 (f)	Voltage dips and interruptions	Table 4 [10]; or §9.7 [4]	V		Applicable to CMT with dedicated charger/power adapter
4.4.1.2 (g)	Surges	Table 2 [10]; Table 3 [10]; Table 4 [10]; or §9.7 [4]	V		
4.4.2	Equipment safety testing	IEC 60950-1 [17];	M		

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
		or IEC 62368-1 [18]			

Annex A

CMT Conformance 3G and 4G Testing / Verification Checklist (Cont'd)

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
5.1	Operating frequencies		M		
5.2.1	Radio interface requirements	Table C-1 [1], [6] and [7], where applicable	M		State the RITs and the 3GPP Releases supported by the CMT, e.g. 3GPP Release 8, 9, 10 and beyond.
	CMT common requirements	§4.2 [1]	-	-	Defines common test environment
	Radiated emissions	§4.2.2 [1]	M		
	Control and monitoring functions	§4.2.4 [1]	M		
	Transmitter spectrum emissions mask	§4.2.3 [2] and/or §4.2.3 [3]	C		In addition to the common requirements in [1], the CMT shall be tested to the essential requirements in [2] for the UTRA FDD technology; and/or essential requirements in [3] for the E-UTRA technology, which includes CA.
	Transmitter adjacent channel leakage power ratio	§4.2.12 [2] and/or §4.2.11 [3]	C		
	Transmitter spurious emissions	§4.2.4 [2] and/or §4.2.4 [3]	C		
	Transmitter maximum output power	§4.2.2 [2] and/or §4.2.2 [3]	C		
	Transmitter minimum output power	§4.2.5 [2] and/or §4.2.5 [3]	C		
	Receiver spurious emissions	§4.2.10 [2] and/or §4.2.10 [3]	C		
	Receiver blocking characteristics	§4.2.7 [2] and/or §4.2.7 [3]	C		
	Receiver spurious response	§4.2.8 [2] and/or §4.2.8 [3]	C		
	Receiver intermodulation characteristics	§4.2.9 [2] and/or §4.2.9 [3]	C		
	Receiver Adjacent Channel Selectivity (ACS)	§4.2.6 [2] and/or §4.2.6 [3]	C		
	Receiver reference sensitivity level	§4.2.13 [2] and/or §4.2.12 [3]	C		
	Out of synchronization handling of output power	§4.2.11 [2] See Note	C		
5.2.2	Other wireless modes such as WLAN, Bluetooth, etc.		C		If applicable, the CMT shall also be tested to the relevant requirements given in IMDA TS SRD.
Note: Out of synchronization requirement in EN 301 908-2 [2] is not included in EN 301 908-13 [3] due to the fact that E-UTRA has network controlled dynamic resource allocation, mitigating the risk of interference in out of synchronization situation.					

CMT Conformance 5G FR1 Testing / Verification Checklist (Cont'd)

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
5.1	Operating frequencies	As specified by IMDA	M		

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
5.2.1	Radio interface requirements	[19]	M		Applies to all NR UE's supporting FR1 Release 15 and beyond.
	CMT common requirements	[22]	-	-	Defines common test environment.
	Radiated emissions	§4.2.2 [1]	M		
	Control and monitoring functions	§4.2.4 [1]	M		
	Transmitter				
	UE maximum output power	§6.2.1, §6.2A, §6.2B, §6.2C, §6.2D [19]	C		In addition to the common requirements in [22], the CMT shall be tested to the additional requirements for the NR technology, which includes CA, UL MIMO and SUL where applicable.
	Minimum output power	§6.3.1, §6.3D.1 [19]	C		
	Out of band emission	§6.5.2, §6.5A.2, §6.5C.2, §6.5D.2 [19]	C		
	Spurious emissions	§6.5.3, §6.5A.3, §6.5C.3, §6.5D.3 [19]	C		
	Receiver				
	Reference sensitivity	§7.3, §7.3A, §7.3B, §7.3C, §7.3D [19]	C		
	Adjacent channel selectivity	§7.5, §7.5A [19]	C		
	Blocking characteristics	§7.6, §7.6A [19]	C		
	Spurious response	§7.7, §7.7D [19]	C		
	Intermodulation characteristics	§7.8 [19]	C		
	Spurious emissions	§7.9 [19]	C		
5.2.2	Other wireless modes such as WLAN, Bluetooth, etc.		C		If applicable, the CMT shall also be tested to the relevant requirements given in IMDA TS SRD.

CMT Conformance 5G FR2 Testing / Verification Checklist (Cont'd)

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
5.1	Operating frequencies	As specified by IMDA	M		
5.2.1	Radio interface requirements	[20]	M		State the RITs and the 3GPP Releases supported by the CMT, e.g. 3GPP Release 15, 16 beyond.
	CMT common requirements	[22]	-	-	
	Radiated emissions	§4.2.2 [1]	M		
	Control and monitoring functions	§4.2.4 [1]	M		
	Transmitter				
	UE Maximum Output Power	§6.2.1, §6.2A.1, §6.2D.1 [20]	C		In addition to the common requirements in [22], the CMT shall be tested to the additional requirements for the NR technology, which includes CA, UL MIMO and SUL where applicable.
	Minimum output power	§6.3.1, §6.3A.1, §6.3D.1 [20]	C		
	Out of band emission	§6.5.2, §6.5A.2, §6.5D.2 [20]	C		
	Spurious emissions	§6.5.3, §6.5A.3, §6.5D.3 [20]	C		
	Receiver				
	Reference sensitivity	§7.3, §7.3A, §7.3D 20]	C		

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
	Adjacent channel selectivity	§7.5, §7.5A, §7.5D [20]	C		
	Blocking characteristics	§7.6, §7.6A, §7.6D [20]	C		
	Spurious response	§7.7 [20]	C		
	Spurious emission	§7.9 [20]	C		
5.2.2	Other wireless modes such as WLAN, Bluetooth, etc.		C		If applicable, the CMT shall also be tested to the relevant requirements given in IMDA TS SRD.

CMT Conformance 5G FR1 and FR2 Interworking operation with other radios testing / Verification Checklist (Cont'd)

IMDA TS CMT §	Parameter	Reference [n] given in § 2 of TS CMT	CR	Yes /No/ NA	Remarks
5.1	Operating frequencies	As specified by IMDA	M		
5.2.1	Radio interface requirements	[21]	M		State the RITs and the 3GPP Releases supported by the CMT, e.g. 3GPP Release 15, 16 beyond.
	CMT common requirements	[22]	-	-	
	Radiated emissions	§4.2.2 [1]	M		
	Control and monitoring functions	§4.2.4 [1]	M		
	Transmitter				
	UE maximum output power	§6.2A.1, §6.2B.1 [21]	C		In addition to the common requirements in [22], the CMT shall be tested to the additional requirements for the NR technology, which includes CA and EN-DC where applicable.
	Minimum Output Power	§6.3B.1 [21]	C		
	Out-of-band emissions	§6.5A.2, §6.5B.2 [21]	C		
	Spurious emissions	§6.5A.3, §6.5B.3, §6.5B.4 [21]	C		
	Receiver				
	Reference sensitivity	§7.3, §7.3A, §7.3B [21]	C		
	Adjacent channel selectivity	§7.5, §7.5B [21]	C		
	Blocking characteristics	§7.6, §7.6B [21]	C		
	Spurious response	§7.7 [21]	C		
	Spurious emission	§7.9 [21]	C		
5.2.2	Other wireless modes such as WLAN, Bluetooth, etc.		C		If applicable, the CMT shall also be tested to the relevant requirements given in IMDA TS SRD.

Annex B

Corrigendum / Addendum

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IMDA TS CMT Issue 1, 1 July 17			
		The IMDA TS CMT Issue 1 has been replaced by the IMDA TS CMT Issue 1 Rev 2. Changes were made to include specifications for 5G NR and to keep up with new developments that have taken place in the IMT systems of the network operators and standards. Main changes include:	Aug 20
2, 7 and 9	§1, §2, §5.2.1 and Annex A	(a) Support for 5G NR and revision of Checklist to include support for 5G NR and to reflect changes in new developments in standards	
5	§4.3	(b) Addition of CMT RF EMF standards to include considerations to the body and higher frequencies	
6	§4.4.1.2	(c) Replacing CISPR 24 with CISPR 35 for immunity testing	
7	§5.1.1 Table 1	(d) Updating of CMT operating bands to include 5G NR	

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IMDA TS CMT Issue 1, Oct 16			
		The IMDA TS CMT Issue 1 has been replaced by the IMDA TS CMT Issue 1 Rev 1. Main changes include:	1 July 17
2, 7 and 8	§1, §5.2.1 and Annex A	(d) Support for LTE-Advanced TDD RIT (E-UTRAN RAT);	
7	§5.1.1 Table 1	(e) Use of E-UTRAN band 38 and band 40	
6	§4.4.2	(f) CMT safety testing to be performed to the IEC 60950-1 safety standard	

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IDA TS CMT Issue 1, Jun 11			
		The IDA TS CMT Issue 1 has been replaced by the IMDA TS CMT Issue 1. Changes are largely editorial to provide clarity of requirements for conformity assessment by equipment suppliers, in line with standards development that has taken place in the SDOs and the IMT systems adopted by network operators. Main changes include:	1 Oct 16
2	§1	(g) Cessation of support for the GSM RITs by 1 April 2017;	
5	§4.3	(h) Updating of measurement procedure for assessment of SAR;	
5	§4.4	(i) Updating of EMC requirements for CMT;	
7	§5.2	(j) Updating of essential requirements for the support of IMT-Advanced / LTE-Advanced RITs; and	
8	Annex A	(k) Addition of a Checklist for facilitating suppliers'	

		declaration of conformity to requirements defined in the Specification.	

Revised TS		Items Changed	Effective Date
Page	**Reference**		
Changes to IDA TS GSM-MT and 3G-MT Issue 1 Rev 2, May 11			
		Title of Specification has been renamed as "Technical Specification for Cellular Mobile Terminal)" (IDA TS CMT Issue 1). The Technical Specification has superseded the following two IDA Technical Specifications: (a) IDA TS GSM-MT Issue 1 Rev 2 (b) IDA TS 3G-MT Issue 1 Rev 2 Changes are mainly editorial in nature, in which the essential technical requirements for compliance formerly defined under the two Specifications (TS GSM-MT and 3G-MT) are now incorporated as one.	Jun 11
3 4	§1.1 §2.2.1	It also includes the requirements for the Radio Access Technology, E-UTRA.	