



Telecommunications Standards Advisory Committee (TSAC)

Technical Specification

Cellular Mobile Terminal

IMDA TS CMT
Issue 1 Rev 4, Feb 2026

Info-communications Media Development Authority
10 Pasir Panjang Road
#03-01 Mapletree Business City
Singapore 117438

© 2026 Info-communications Media Development Authority. All rights reserved.

This document may be downloaded from the IMDA website at <https://www.imda.gov.sg> and shall not be distributed without written permission from IMDA

Acknowledgement

The Info-communications Media Development Authority (IMDA) and the Telecommunications Standards Advisory Committee (TSAC) would like to acknowledge the following members of the TSAC Focus Area 6 and Task Force (TF) for Cellular Base Station and Repeater System / Cellular Mobile Terminal (TSAC CBS/CMT TF) for their invaluable contributions to the preparation of this Technical Specification:

List of TSAC FA 6 CBS/CMT TF Members (2018-2021)

Focus Area 6 Chairperson	Dr Oh Ser Wah, CEO, Whizpace Pte Ltd
CBS/CMT Task Force Chairman(s)	Dr David Soldani; CSO Office Huawei (ASIA Pacific Region), CTO and CSO Huawei (Australia)
	Mr Kuan Wai Mun; Director, Radio Network Performance, Singapore Telecommunications Ltd
Editor	Dr Ma Yugang, Senior Scientist, Institute for Infocomm Research
Secretary	Mr Lim Wai Yean, Senior Manager, Info-communications Media Development Authority

S/N	Organisation	Name
1	Apple	Mr Song Qiaojian, APAC Regulatory Compliance Manager
2	Ericsson Telecommunications Pte Ltd	Mr Albert Tioe, Principal Solution Architect
3	Ericsson Telecommunications Pte Ltd	Mr Derek Wang, Principal Solution Architect
4	Huawei International Pte Ltd	Mr Scott Zhang, Vice President, Huawei International
5	M1 Limited	Mr Simon Foo, General Manager
6	Nokia Corporation	Mr Guillaume Mascot, Head of Government Relations APJ
7	Nanyang Technological University	Associate Professor Teh Kah Chan
8	National University of Singapore	Professor Biplab Sikdar
9	Rohde & Schwarz	Mr Mahesh Basavaraju, Market Segment Manager - Wireless Communication
10	Singapore University of Technology and Design	Associate Professor Yuen Chau
11	StarHub Ltd.	Mr Steven Chia, Lead Engineer
12	Simba Telecom Pte Ltd.	Mr Dennis Woo, Core Manager
13	Simba Telecom Pte Ltd.	Mr Kenneth Loh, RF Manager

Telecommunications Standards Advisory Committee (TSAC)

The TSAC advises IMDA on the setting of ICT standards as well as on the development and recommendation of specifications, standards, information notes, guidelines and other forms of documentation for adoption and advancement of the standardisation effort of the Singapore ICT industry (hereafter termed “IMDA Standards”).

Telecommunications standards-setting in Singapore is achieved with the assistance of TSAC, where professional, trade and consumer interest in telecommunications standards is represented on the TSAC with representatives from network and service operators, equipment suppliers and manufacturers, academia and researchers, professional bodies and other government agencies.

List of TSAC Members (2024-2027)

TSAC Chairman:

Dr Chin Woon Hau
Director (Technology & Standards)
Info-communications Media Development Authority (IMDA)

TSAC Members:

Mr George Choo	President Association of Telecommunications Industry of Singapore
Mr Andy Phang	Assistant Director, Technology and Standards Info-communications Media Development Authority
Mr Marcus Tan Cheng Lin	Head of Cybersecurity Department Institute for Infocomm Research
Mr Denis Seek	CTO M1 Limited
Mr Ng Thian Khoon	Head, Broadcast Engineering/ Broadcast Engineering (Technology) Mediacorp Pte. Ltd.
Associate Professor Chau Yuen	Associate Professor, School of Electrical & Electronic Engineering Provost's Chair in Wireless Communications Nanyang Technological University
Professor Biplab Sikdar	Head of Department, Electrical and Computer Engineering, & Area Director (Communications & Networks) National University of Singapore
Mr Gao Peng	Head of Radio Planning Simba Telecom Pte. Ltd.
Professor Susanto Rahardja	Professor, Engineering Cluster Singapore Institute of Technology
Mr Lim Yu Leong	Vice President, Group Strategy, Engineering & Innovation Singapore Telecommunications Limited
Professor Tony Quek	Head of Information Systems and Technology Design Pillar; Cheng Tsang Man Chair Professor Singapore University of Technology and Design
Mr Heng Hwee Tong	Head of Engineering and Corporate IT SPTel Pte. Ltd.
Mr Eddie Teo Soo Kwok	Assistant Vice President, Radio Technology StarHub Ltd.

Contents

1	Scope	3
2	References	3
3	Abbreviations.....	6
4	General Requirements.....	7
4.1	International Mobile Station Equipment Identity or Permanent Equipment Identity	7
4.2	Keypad.....	7
4.3	Radio Frequency Electromagnetic Field (RF EMF) Safety: SAR and Power Density Requirements.....	7
4.4	Electromagnetic Compatibility (EMC)	7
4.4.1	EMC assessment	7
4.5	Equipment safety testing	8
5	Technical Requirements	9
5.1	Operating Frequencies	9
5.2	Radio Interface Requirements.....	10
5.3	Voice-Over-LTE (VoLTE) requirements	10
5.4	Emergency cell broadcast.....	10
	Mandated CMT Requirements	10
5.4.1	10
	Optional CMT Requirement	11
5.4.2	11
5.4.3	Configurations for different alert types.....	12
	Annex A CMT Conformance Testing / Verification Checklist.....	13
A1	General requirements for CMT	13
A2	Conformance requirements for all CMT.....	14
A3	Conformance requirements for 4G CMT.....	14
A4	Conformance requirements for 5G FR1 CMT	15
A5	Conformance requirements for 5G FR2 CMT.....	15
A6	Conformance requirements for CMT with 5G FR1 and FR2 interworking operation with other radios	16
A7	Conformance requirements for CMT that operates on band 26	16
A8	Conformance VoLTE requirements for CMT devices designed for voice calling	17
	Annex B Corrigendum / Addendum	18

NOTICE

THE INFO-COMMUNICATIONS MEDIA DEVELOPMENT AUTHORITY (“IMDA”) MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND WITH REGARD TO THE MATERIAL PROVIDED HEREIN AND EXCLUDES ANY EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS OF NON-INFRINGEMENT, MERCHANTABILITY, SATISFACTORY QUALITY AND FITNESS FOR A PARTICULAR PURPOSE. SUBJECT TO THE MAXIMUM EXTENT PERMITTED UNDER LAW, IMDA SHALL NOT BE RESPONSIBLE OR LIABLE TO YOU OR ANY THIRD PARTY FOR ANY ERRORS AND/OR OMISSIONS CONTAINED HEREIN OR FOR ANY LOSSES OR DAMAGES (INCLUDING ANY LOSS OF PROFITS, BUSINESS, GOODWILL OR REPUTATION, AND/OR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES) IN CONNECTION WITH THE USE OF THIS MATERIAL.

IMDA RESERVES THE RIGHT TO CHANGE, MODIFY OR ADD TO ANY PART OF THIS DOCUMENT. NOTHING HEREIN IS INTENDED TO CREATE OR IMPOSE ANY BINDING LEGAL OBLIGATIONS OR LIABILITY WHATSOEVER ON IMDA, WHETHER EXPRESSED OR IMPLIED, AND WHETHER CONTRACTUAL OR OTHERWISE. WITHOUT PREJUDICE TO THE FOREGOING, NOTHING IN THIS DOCUMENT SHALL BIND IMDA TO ADOPT ANY PARTICULAR COURSE OF ACTION. CONSEQUENTLY, NOTHING HEREIN SHALL BE CONSTRUED AS GRANTING ANY EXPECTATION, WHETHER PROCEDURAL OR SUBSTANTIVE IN NATURE, THAT IMDA WILL TAKE OR NOT TAKE ANY PARTICULAR COURSE OF ACTION IN THE FUTURE, ARISING FROM OR DUE TO ANYTHING IN THIS DOCUMENT OR IN THE EXERCISE OF ITS DISCRETION AS A PUBLIC AUTHORITY.

IMDA DRAWS ATTENTION TO THE POSSIBILITY THAT ANY PRACTICE OR IMPLEMENTATION OF THIS STANDARD/SPECIFICATION MAY INVOLVE THE USE OF INTELLECTUAL PROPERTY RIGHTS AND TAKES NO POSITION CONCERNING THE EXISTENCE, VALIDITY AND/OR APPLICABILITY OF ANY SUCH INTELLECTUAL PROPERTY RIGHTS, WHETHER ASSERTED BY TSAC MEMBERS OR ANY THIRD PARTY.

AS OF THE DATE OF ISSUANCE OF THIS STANDARD/SPECIFICATION, IMDA HAS NOT RECEIVED WRITTEN NOTICE OF ANY PATENT RIGHTS WHICH MAY BE RELEVANT IN RELATION TO THE IMPLEMENTATION OF THIS STANDARD/SPECIFICATION. HOWEVER, IMPLEMENTERS ARE CAUTIONED THAT THIS MAY NOT REPRESENT THE LATEST INFORMATION AND ARE THEREFORE STRONGLY URGED TO CHECK WITH THE RELEVANT DATABASE IN ITU, ISO, IEC OR THE RELEVANT STANDARDS DEVELOPMENT ORGANISATION FOR INFORMATION OF INTELLECTUAL PROPERTY RIGHTS. IMPLEMENTERS ARE ADVISED TO OBTAIN THEIR OWN PROFESSIONAL, TECHNICAL AND/OR LEGAL ADVICE AND CONDUCT ALL NECESSARY DUE DILIGENCE, INCLUDING BUT NOT LIMITED TO MAKING SUCH INVESTIGATIONS OR SEEKING CLARIFICATIONS AS MAY BE APPROPRIATE, IN REGARD TO ANY DECISION OR ACTION THAT THEY INTEND TO TAKE, OR PRIOR TO THE IMPLEMENTATION OF ANY STANDARD/SPECIFICATION AS MAY BE REQUIRED.

Technical Specification for Cellular Mobile Terminals

1 Scope

This Specification defines the minimum technical requirements for Cellular Mobile Terminals (termed “CMTs” in this Specification) to be used in the Public Mobile Radio Communication System and services which employ:

- (a) ITU IMT-2000 radio interface technologies (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.

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 Organisations¹.

1. 3GPP TS 23.003: Technical Specification Group Core Network and Terminals; Numbering, addressing and identification
2. 3GPP TS 34.229-1: Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification
3. 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)
4. 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
5. ETSI EN 301 908-1: IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements
6. 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)
7. ETSI EN 301 908-25: IMT cellular networks; Harmonized Standard for access to radio spectrum; Part 25: New Radio (NR) User Equipment (UE)

¹ Implementers of these ETSI standards should check with the ETSI Web Server (<https://ipr.etsi.org>) whether Intellectual Property Rights have been declared to ETSI.

8. ETSI EN 301 489-1: EMC standard for radio equipment and services; Part 1: Common technical requirements
9. 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
10. ETSI TS 102 900: Emergency Communications (EMTEL); European Public Warning System (EU-ALERT) using the Cell Broadcast Service
11. ETSI TS 123 041: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; Technical realization of Cell Broadcast Service (CBS)
12. ETSI TS 138 508-1: 5G; 5GS; User Equipment (UE) conformance specification; Part 1: Common test environment
13. ETSI TS 138 521-1: 5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Range 1 Standalone
14. ETSI TS 138 521-2: 5G; NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Range 2 Standalone
15. FCC Part 22 Subpart H: Cellular radiotelephone service
16. FCC Part 90 Subpart S: Regulations governing the licensing and use of frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz bands
17. FCC Title 47 CFR Part 10: Wireless Emergency Alerts
18. IEC 60086-4: Primary batteries – Part 4: Safety of lithium batteries
19. IEC 62133: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications
20. IEC 62368-1: Audio/video, information and communication technology equipment – Part 1: Safety requirements
21. IEC CISPR 32: Electromagnetic compatibility of multimedia equipment – Emission requirements
22. IEC CISPR 35: Electromagnetic compatibility of multimedia equipment – Immunity requirements
23. 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)
24. 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)
25. IEC/EN 62209-3: 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 3: Vector measurement-based systems (frequency range of 600 MHz to 6 GHz)
26. IEC/IEEE 62209-1528:2020: Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-worn wireless communication

devices - Human models, instrumentation and procedures (Frequency range of 4 MHz to 10 GHz)

27. IEC/IEEE 63195-1: Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) - Part 1: Measurement procedure
28. 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
29. ISO 7637-2: Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only
30. ITU-R M.1457-14: Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)
31. ITU-R M.2012-4: Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-Advanced (IMT-Advanced)
32. ITU-R M.2412-0: Guidelines for evaluation of radio interface technologies for IMT-2020
33. ITU-T K.116: EMC requirements and test methods for radio telecommunication terminal equipment
34. UL 1642: Standard for Lithium batteries

3 Abbreviations²

3GPP	3rd Generation Partnership Project
AC	Alternating Current
CA	Carrier Aggregation
CBS	Cell Broadcast Service
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
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
REDCAP	Reduced Capability
RF	Radio Frequency
RIT	Radio Interface Technology
SAR	Specific Absorption Rate
SDO	Standards Development Organisation
SELV	Safety Extra-Low Voltage
TDD	Time Division Duplex
WLAN	Wireless Local Area Network

² 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.

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

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. The CMT will need to comply with any of the following applicable standards: CENELEC EN 50360, CENELEC EN 50566 (minimum Ed. 2017), IEC/EN 62209-1³, IEC/EN 62209-2³, IEC/EN 62209-3, IEC/EN 62209-1528:2020, IEC TR 63170 and IEC/IEEE 63195-1.

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.

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)

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 ETSI EN 301 489-1 or ITU-T K.116. The ETSI EN 301 489-1 standard shall be used in conjunction with the ETSI EN 301 489-52 standard for CMT that supports the 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, or §8.2 of EN 301 489-1;
- (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; and
- (c) Conducted emission at the AC mains port shall be measured for CMT with dedicated charger or adapter

³ Standards have been withdrawn and replaced by IEC/EN 62209-1528. These standards will no longer be accepted by IMDA after 1 Oct 2025.

to Class B requirements defined in §5 and Table A.10 of CISPR 32. Equipment with DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment.

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).

4.4.1.2 EMS or immunity testing

The following immunity tests may be performed on the CMT to requirements defined in CISPR 35, §11 of ITU-T K.116 or §9 of EN 301 489-1, 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 AC mains power ports, and additionally on signal ports, wired ports, control ports and DC power ports that have cables longer than 3 m;
- (d) RF common mode 0.15 MHz to 80 MHz at AC mains power ports, and additionally on signal ports, wired ports, control ports and DC 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;
- (f) Voltage dips and interruptions at AC mains power port of mobile or portable terminal with dedicated charger/power adapter; and
- (g) Surges, common and differential mode at AC mains power port of mobile or portable terminal with dedicated charger/power adapter, and additionally on wired network ports.

4.5 Equipment safety testing

Equipment suppliers (including manufacturers, importers, distributors, retailers and other traders) shall ensure that they only place products which are safe on the market. They can enhance the safety of their products by the following ways:

- (a) Vigorously testing their products before placing them on the market;
- (b) Ensuring that their products are certified to international safety standards;
- (c) Where products are already under the purview of other government agencies, ensuring that they satisfy the relevant regulatory requirements by the agencies; and
- (d) Informing users/consumers of any potential hazards or risks arising from the use of their products.

Equipment shall comply with the IEC 62368-1 (minimum Ed. No. 2) standard and any lithium batteries it uses shall adhere to UL 1642, IEC 62133 or IEC 60086-4.

5 Technical Requirements

5.1 Operating Frequencies

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

Table 1: CMT Operating Frequency Bands

E-UTRAN Band	NR Band	Direction of Transmission	Frequency Range
1	n1	Transmit	1920 MHz – 1980 MHz
		Receive	2110 MHz – 2170 MHz
3	n3	Transmit	1710 MHz – 1785 MHz
		Receive	1805 MHz – 1880 MHz
7	n7	Transmit	2500 MHz – 2570 MHz
		Receive	2620 MHz – 2690 MHz
8	n8	Transmit	880 MHz – 915 MHz
		Receive	925 MHz – 960 MHz
26	n26	Transmit	814 MHz – 849 MHz
		Receive	859 MHz – 894 MHz
28	n28	Transmit	703 MHz – 748 MHz
		Receive	758 MHz – 803 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

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, and conformity to any or a combination of standards given in Table 2.

Table 2: IMT RITs and the Reference Standards used for CMT

IMT-Advanced / IMT-2020 terrestrial RIT	RIT name in SDO	Reference standards used
LTE-Advanced	E-UTRA	ETSI EN 301 908-13 / FCC Part 22 ⁴ / FCC Part 90S ⁴
IMT-2020	5G NR	ETSI EN 301 908-25 / ETSI TS 138 521-1 / ETSI TS 138 521-2 /

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”).

5.2.3 2G connectivity in the CMT must be switched off in the factory default configuration, and the CMT must not connect or attempt to connect to 2G networks unless explicitly enabled by the user, and activation of 2G must require deliberate user action such as navigating to a settings menu or entering a confirmation prompt.

5.3 Voice-Over-LTE (VoLTE) requirements

5.3.1 CMT devices designed for voice calling shall support VoLTE technology as per 3GPP specifications. The VoLTE functionality shall be turned on by default, and it shall be compatible with VoLTE services provided by all mobile network operators in Singapore. The device shall support the necessary VoLTE profiles for each operator to ensure seamless connectivity and interoperability for making and receiving VoLTE calls in Singapore.

5.3.2 The device shall be able to configure VoLTE settings based on the network operator’s profile and shall also allow additional emergency numbers sent by the serving network to be downloaded and designated as emergency numbers.

5.3.3 The device must be able to make emergency calls via VoLTE.

5.4 Emergency cell broadcast

5.4.1 Mandated CMT Requirements

5.4.1.1 To ensure that the CMT is configured according to the settings in Table 3.

5.4.1.2 To support CBS message length up to a maximum of 1395 characters.

5.4.1.3 To support receiving and presenting CBS messages in multiple languages.

5.4.1.4 To support the display of warning notification upon reception without any user interaction.

⁴ Only for equipment that operates on LTE Band 26

- 5.4.1.5 To allow the continuation of the alerting indication for a specific Warning Notification until suppressed by users' manual operation (e.g. by pushing keys).
- 5.4.1.6 To have the ability to present previously displayed warning notifications if requested by user.
- 5.4.1.7 To support concurrent reception of multiple warning notifications.
- 5.4.1.8 To ensure that the battery life of CMT shall not be significantly reduced by the emergency cell broadcast, unless it is caused by network issues.
- 5.4.1.9 To ensure that alert messages shall take priority over all other CMT functions, but shall not pre-empt active voice or data sessions.
- 5.4.1.10 To ensure that user could review the messages at a later time.
- 5.4.1.11 To support the presentation and use of a Uniform Resource Locator (URL), which is a reference (an address) to a resource on the internet, or an embedded telephone number.
- 5.4.1.12 To ensure that both SG Alert and Test Alert have the following audio attention signal and vibration cadence specified in FCC Title 47 CFR Part 10 with the following characteristics:

Audio attention signal

- a. The audio attention signal must have a temporal pattern of one long tone of two (2) seconds, followed by two short tones of one (1) second each, with a half (0.5) second interval between each tone. The entire sequence must be repeated twice with a half (0.5) second interval between each repetition.
- b. For devices that have polyphonic capabilities, the audio attention signal must consist of the fundamental frequencies of 853 Hz and 960 Hz transmitted simultaneously.
- c. For devices with only a monophonic capability, the audio attention signal must be 960 Hz.

Vibration cadence

- a. The vibration cadence must have a temporal pattern of one long vibration of two (2) seconds, followed by two short vibrations of (1) second each, with a half (0.5) second interval between each vibration. The entire sequence must be repeated twice with a half (0.5) second interval between each repetition.

5.4.2 Optional CMT Requirement

- 5.4.2.1 CMTs may support Device-Based Geo-Fencing (DBFG) as defined in ETSI TS 102 900 and ETSI TS 123 041.

5.4.3 Configurations for different alert types

5.4.3.1 Table 3 provided the CMT configurations used for Cell Broadcast Service, including alert types, message IDs and device behaviours.

Table 3: CMT configurations on CBS Alert Types

Configurations	Types of alert	
Alert title behaviour		
Alert Title	SG Alert	Test Alert
Message ID	4370	4380
Message ID in additional language	4383	4393
Language filtering	On	On
Menu setting		
Enabled by default	Yes	No
Allow user opt-out	No	Yes
Sound and Vibration		
Override "Do not disturb mode"	Yes	No
Alert volume	Max Volume	Device setting
Alert notification duration	10.5 sec	10.5 sec
Alert vibration	See 5.4.1.12 for vibration pattern	See 5.4.1.12 for vibration pattern
Alert tone	See 5.4.1.12 for audio attention signal	See 5.4.1.12 for audio attention signal

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**.

A1 General requirements for CMT

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
1	IMT-Advanced / LTE-Advanced / LTE-Advanced Pro / IMT-2020 RITs		M	State the type of CMT
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 3GPP TS 23.003 for more information on PEI
4.2	Keypad	ITU-T E.161	C	
4.3	RF EMF safety (SAR; power density) requirements	See section 4.3 for standards	M	
4.4	EMC		M	
4.4.1	EMC assessment		M	
4.4.1.1 (a)	Radiated emissions	IEC CISPR 32 / ETSI EN 301 489-1 (to be used with ETSI EN 301 489-52)	C	Applicable to ancillary equipment not incorporated in the radio equipment
4.4.1.1 (b)	Conducted emission: DC power port		C	Applicable to CMT for vehicular use (regardless of DC cable length)
4.4.1.1 (c)	Conducted emission: AC mains power port		C	Applicable to CMT with dedicated charger/power adapter
4.4.1.2 (a)	RF electromagnetic field (80 MHz to 6 GHz)	IEC CISPR 35 / ETSI EN 301 489-1 (to be used with ETSI EN 301 489-52)	V	
4.4.1.2 (b)	Electrostatic discharge		V	
4.4.1.2 (c)	Fast transients common mode		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		V	Applicable to CMT with dedicated charger/power, and DC power port with cable longer than 3 m
4.4.1.2 (e)	Transients and surges, vehicular environment		V	Applicable to CMT intended for mobile use in vehicles; refer to ISO 7637-2 for conducted

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
				electrical transients of equipment installed on vehicles
4.4.1.2 (f)	Voltage dips and interruptions		V	Applicable to CMT with dedicated charger/power adapter
4.4.1.2 (g)	Surges		V	
4.5	Equipment safety testing	IEC 62368-1 (min. Ed. no. 2)	M	Lithium batteries to comply with UL 1642, IEC 62133 or IEC 60086-4

A2 Conformance requirements for all CMT

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
5.1	Operating frequencies	As specified by IMDA	M	
5.2.1	Radio interface requirements	ETSI EN 301 908-13 / FCC Part 22 / FCC Part 90S	M	
	Radiated emissions	ETSI EN 301 908-1	M	
	Control and monitoring functions		M	
5.2.2	Other wireless modes such as WLAN, Bluetooth, etc.	IMDA TS SRD	C	If applicable, the CMT shall also be tested to the relevant requirements given in IMDA TS SRD.
5.2.3	Disabling of 2G networks connectivity by default	-	M	
5.4	Emergency cell broadcast	-	M	

A3 Conformance requirements for 4G CMT

IMDA TS CMT §	Parameter	Reference standard	CR
5.2.1	Transmitter spectrum emissions mask	ETSI EN 301 908-13	M
	Transmitter adjacent channel leakage power ratio		M
	Transmitter spurious emissions		M
	Transmitter maximum output power		M
	Transmitter minimum output power		M
	Receiver spurious emissions		M
	Receiver blocking characteristics		M
	Receiver spurious response		M
	Receiver intermodulation characteristics		M
	Receiver Adjacent Channel Selectivity (ACS)		M
	Receiver reference sensitivity level		M

A4 Conformance requirements for 5G FR1 CMT

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
5.2.1	Transmitter	ETSI EN 301 908-25 / ETSI TS 138 521-1		In addition to the common requirements in ETSI EN 301 908-1, the CMT shall be tested to the additional requirements for the NR technology, which includes CA, UL MIMO and SUL where applicable.
	UE maximum output power		M	
	Minimum output power		M	
	Out of band emission		M	
	Spurious emissions		M	
	Receiver			
	Reference sensitivity		M	
	Adjacent channel selectivity		M	
	Blocking characteristics		M	
	Spurious response		M	
	Intermodulation characteristics		M	
	Spurious emissions		M	
	RedCap parameters			
	UE maximum output power	ETSI TS 138 521-1	C	Applicable for CMT with Redcap
	Reference sensitivity		C	

A5 Conformance requirements for 5G FR2 CMT

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
5.2.1	Transmitter	ETSI EN 301 908-25 / ETSI TS 138 521-2		In addition to the common requirements in ETSI EN 301 908-1, the CMT shall be tested to the additional requirements for the NR technology, which includes CA, UL MIMO and SUL where applicable.
	UE Maximum Output Power		M	
	Minimum output power		M	
	Out of band emission		M	
	Spurious emissions		M	
	Receiver			
	Reference sensitivity		M	
	Adjacent channel selectivity		M	
	Blocking characteristics		M	
	Spurious response		M	
	Spurious emission		M	

A6 Conformance requirements for CMT with 5G FR1 and FR2 interworking operation with other radios

IMDA TS CMT §	Parameter	Reference standard	CR	Remarks
5.2.1	Transmitter	ETSI EN 301 908-25		
	UE maximum output power		M	In addition to the common requirements in ETSI EN 301 908-1, the CMT shall be tested to the additional requirements for the NR technology, which includes CA and EN-DC where applicable.
	Minimum Output Power		M	
	Out-of-band emissions		M	
	Spurious emissions		M	
	Receiver			
	Reference sensitivity		M	
	Adjacent channel selectivity		M	
	Blocking characteristics		M	
	Spurious response		M	
	Spurious emission		M	

A7 Conformance requirements for CMT that operates on band 26

IMDA TS CBS §	Parameter	Reference Standard	CR
5.1	Operating frequencies	As specified by IMDA	M
5.2.1	Radio interface requirements	FCC Part 22 / FCC Part 90S / IEEE ANSI C63.26-2015	M

A8 Conformance VoLTE requirements for CMT devices designed for voice calling

S/N	Section number in 3GPP TS 34.229-1	Description	CR
		Registration	
1	8.1	Initial registration	M
2	8.2	User initiated re-registration	M
3	8.4	Invalid behaviour - 423 Interval	M
4	8.16	User initiated re-registration – 423 Interval	M
		Authentication	
5	9.1	Invalid Behaviour – MAC Parameter Invalid	M
6	9.2	Invalid Behaviour – SQN out of range	M
		Subscription	
7	10.1	Invalid Behaviour – 503 Service Unavailable	M
		Notification	
8	11.1	Network initiated deregistration	M
9	11.2	Network initiated re-authentication	M
		Call Control	
10	12.2	MO Call with preconditions at both originating UE and terminating UE – 503 Service Unavailable	M
11	12.2a	MO Call with preconditions at both originating UE and terminating UE – 504 Server Time-out	M
12	12.12	MO MTSI Voice Call Successful with preconditions at both originating UE and terminating UE	M
13	12.13	MT MTSI speech call with preconditions at both originating UE and terminating UE	M
		Codec selecting	
14	16.2	Speech AMR, indicative selective codec modes	M
15	16.3	Speech AMR-WB, indicate all codec modes	M
16	16.4	Speech AMR-WB, indicate selective codec modes	M
		Emergency Service over IMS	
17	19.1.2	Emergency call with emergency registration/Success/Location information not available	M
18	19.4.2	Emergency call without emergency registration / EPS / UE contains an ISIM or USIM / UE is in state EMM-REGISTERED.LIMITED-SERVICE	M
19	19.4.5	Emergency call without emergency registration / UE credentials are not accepted	M
20	19.5.1	New initial emergency registration / UE obtains from the serving IP-CAN an IP address different than the IP address used for the emergency registration	M

Annex B
Corrigendum / Addendum

Revised TS	Items Changed	Date of Issue
Reference	Changes to IMDA TS CMT Issue 1 Rev 3, Dec 2025	
§2 §4.5 §5.2.3 §5.4	<p>The IMDA TS CMT Issue 1 Rev 3 has been replaced by the IMDA TS CMT Issue 1 Rev 4.</p> <p>Main changes include:</p> <ul style="list-style-type: none"> (a) Re-ordering of references (b) Addition of reference standard IEC 60086-4 for lithium battery (c) Addition of requirements for CMT to disable 2G connectivity by default (d) Addition of requirements for CMT for emergency cell broadcast 	Feb 2026

Revised TS	Items Changed	Date of Issue
Reference	Changes to IMDA TS CMT Issue 1 Rev 2, Sep 2020	
§4.3 §4.4.1.2 §4.5 §5.1, Table 1 §5.2.1, Table 2 §5.3 Annex A2 and A3 Annex A4 Annex A7 Annex A8	<p>The IMDA TS CMT Issue 1 Rev 2 has been replaced by the IMDA TS CMT Issue 1 Rev 3.</p> <p>Main changes include:</p> <ul style="list-style-type: none"> (a) Changes to RF EMF standards – IEC/EN 62209-1 and IEC/EN 62209-2 will no longer be allowed for compliance from 1 Oct 2025 onwards; replaced by IEC/EN 62209-1528:2020. Addition of IEC/EN 62209-3, IEC/EN 62209-1528:2020 and IEC/IEEE 63195-1 as reference standards (b) Changes to clauses (c) and (d) to clarify that tests are to be done on all AC power ports regardless of cable lengths, and that tests are to be done on signal, wired, controlled and DC power ports that have cables longer than 3 m (c) Changes to clauses (g) to include tests on wired network ports (d) Changes to requirements on equipment safety testing (e) Addition of band 26 and band 28 (f) Removal of reference standards for UTRA FDD (g) Addition of VoLTE requirements (h) Removal of reference standard ETSI EN 301 908-2 for UTRA testing (i) Addition of testing parameters for 5G FR1 devices with RedCap capability (j) Addition of requirements for CMTs operating on band 26 (k) Provision of VoLTE requirements 	Dec 2024

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IMDA TS CMT Issue 1 Rev 1, 1 July 17			
2, 7 and 9	§1, §2, §5.2.1 and Annex A	<p>The IMDA TS CMT Issue 1 Rev 1 has been replaced by the IMDA TS CMT Issue 1 Rev 2.</p> <p>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.</p> <p>Main changes include:</p> <ul style="list-style-type: none"> (a) Support for 5G NR and revision of Checklist to include support for 5G NR and to reflect changes in new developments in standards (b) Addition of CMT RF EMF standards to include considerations to the body and higher frequencies (c) Replacing CISPR 24 with CISPR 35 for immunity testing (d) Updating of CMT operating bands to include 5G NR 	Sep 2020

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IMDA TS CMT Issue 1, Oct 16			
2, 7 and 8	§1, §5.2.1 and Annex A	<p>The IMDA TS CMT Issue 1 has been replaced by the IMDA TS CMT Issue 1 Rev 1.</p> <p>Main changes include:</p> <ul style="list-style-type: none"> (a) Support for LTE-Advanced TDD RIT (E-UTRAN RAT); (b) Use of E-UTRAN band 38 and band 40 (c) CMT safety testing to be performed to the IEC 60950-1 safety standard 	1 July 2017

Revised TS		Items Changed	Date of Issue
Page	Reference		
Changes to IDA TS CMT Issue 1, Jun 11			
2	§1	The IDA TS CMT Issue 1 has been replaced by the IMDA TS CMT Issue 1.	1 Oct 2016
5	§4.3	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.	
5	§4.4	Main changes include:	
7	§5.2	<ul style="list-style-type: none"> (a) Cessation of support for the GSM RITs by 1 April 2017; (b) Updating of measurement procedure for assessment of SAR; (c) Updating of EMC requirements for CMT; (d) Updating of essential requirements for the support of IMT-Advanced / LTE-Advanced RITs; and (e) Addition of a Checklist for facilitating suppliers' declaration of conformity to requirements defined in the Specification. 	
8	Annex A		

Revised TS		Items Changed	Effective Date
Page	Reference		
Changes to IDA TS GSM-MT and 3G-MT Issue 1 Rev 2, May 11			
3 4	§1.1 §2.2.1	<p>Title of Specification has been renamed as "Technical Specification for Cellular Mobile Terminal" (IDA TS CMT Issue 1).</p> <p>The Technical Specification has superseded the following two IDA Technical Specifications:</p> <ul style="list-style-type: none"> (a) IDA TS GSM-MT Issue 1 Rev 2 (b) IDA TS 3G-MT Issue 1 Rev 2 <p>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.</p> <p>It also includes the requirements for the Radio Access Technology, E-UTRA.</p>	Jun 2011