

**UNITED REPUBLIC OF TANZANIA
TANZANIA COMMUNICATIONS REGULATORY AUTHORITY
ISO 9001: 2015 CERTIFIED**



MINIMUM TECHNICAL SPECIFICATIONS

FOR

CELLULAR MOBILE TERMINALS

Document Number: [TS007](#)

Version: [2.0](#)

Date: [July 2021](#)

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PART 1: Introduction

Tanzania Communications Regulatory Authority (TCRA), established under the Tanzania Communications Regulatory Authority Act No.12 of 2003, is mandated among other duties, to license communications and broadcasting operators and type approve communication equipment for use in the United Republic of Tanzania.

Pursuant to Regulation 4 of the Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020 the Authority is mandated to formulate technical standards for all the regulated services.

The Authority, therefore, wishes to notify all importers of Cellular Mobile Terminal equipment the minimum technical requirements and specifications for Cellular Mobile Terminals. The specifications have been revised on grounds of technology advancement, safety requirements for consumers and the surrounding environment.

PART 2: Scope and Purpose

This specification defines the minimum technical requirements for Cellular Mobile Terminals to be used in the public mobile radio communication systems and services which employ one or more of the following technology as defined by ITU;

- a) Global System for Mobile Communications (GSM)
- b) ITU IMT-2000 (UTRA FDD)
- c) ITU IMT-Advanced (E-UTRA FDD and E-UTRA TDD)
- d) ITU IMT 2020 (5G NR)

Cellular Mobile Terminals may include mobile phones, portable and vehicle-mounted equipment, RF interface cards, cordless phone receivers, and modems.

PART 3: Terms and Definitions

For the purposes of this document unless stated otherwise:-

- **Cellular Mobile Terminal** refers to an electronic device that is capable of connecting to the cellular network to use cellular network services.
- **Mobile Phone** refers to a portable handheld phone with a built-in rechargeable battery that can make and receive calls while the user is stationary or moving within a service area. It can also use other cellular network services like sending and receiving messages, connecting to the internet, etc.

PART 4: Abbreviations

5G NR	Fifth-generation New Radio
CMT	Cellular Mobile Terminal
EMC	Electromagnetic compatibility
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility
E-UTRA	Evolved Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access
FDD	Frequency Division Duplex
FM	Frequency Modulation
GSM	Global System for Mobile Communications
GSMA	GSM Association
ICNRP	International Commission on Non-Ionizing Radiation Protection
IEC	International Electro-technical Commission
IEEE	Institute of Electrical and Electronics Engineers
IMEI	International Mobile Equipment Identity
IMT	International Mobile Telecommunications
ITU	International Telecommunication Union
MODEM	Modulator-Demodulator
RoHS	Restriction of Hazardous Substance
RF	Radio Frequency
SAR	Specific Absorption Rate
SIM	Subscriber Identity Module
TCRA	Tanzania Communications Regulatory Authority
TDD	Time Division Duplex
UICC	Universal Integrated Circuit Card
USB	Universal Serial Bus
UTRA	Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access
WLAN	Wireless Local Area Network

PART 5: References

For the technical requirements captured in this specification, references have 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 organizations

S/N	Reference No.	Title
1.	IEC/EN 50566:2017	Product standard to demonstrate compliance of radio-frequency fields from handheld and body-mounted wireless communication devices used by the general public (30 MHz – 6 GHz)
2.	IEC/EN 50360:2017	Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)
3.	IEC/EN 60950-1	Information technology equipment- Safety – Part1: General requirements.
4.	IEC 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)
5.	EN 62321	Electrotechnical products – Determination of levels of six regulated substances (lead, mercury, cadmium, Hexavalent chromium, Polybrominated biphenyls, Polybrominated diphenyl ethers).
6.	ISO/IEC 7810	Identification cards — Physical characteristic is an international standard that defines the physical characteristics for identification cards
7.	ETSI TS 102 221	Smart Cards; UICC-Terminal interface; Physical and logical characteristics
8.	ETSI TS 102.671 V9.0.0	Smart Cards; Machine to Machine UICC; Physical and logical characteristics
9.	GSMA SGP.22 V1.0	eSIM Technical Specification
10.	ITU-T E.161	Arrangement of digits, letters, and symbols on telephones and other devices that can be used for gaining access to a telephone network

11.	ITU-T P.381	Technical requirements and test methods for the universal wired headset or headphone interface of digital mobile terminals
12.	ETSI EN 301 511	Global System for Mobile Communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
13.	ETSI EN 301 908-01	IMT cellular networks Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements
14.	ETSI EN 301 908-02	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)
15.	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)
16.	EN 301 908-25	IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 25: New Radio (NR) User Equipment (UE)
17.	ITU-R M.1457-9	Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000).
18.	ITU-T Rec. L.1000	ITU recommendation on the universal power adapter and charger solution for mobile terminals and other hand-held ICT devices
19.	IEC/EN 62368-1	Audio/video, information and communication technology equipment - Part 1: Safety requirements
20.	IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substance

PART 6: General Requirements

S/N	Requirement	Details
1	Identification mark	Each CMT shall be marked with the manufacturer's brand or identification mark, and the manufacturer's model or type reference. The marking required shall be legible, indelible and readily visible
2	IMEI identity	Each CMT shall be allocated a unique 'International Mobile Equipment Identity (IMEI)'. The manufacturer shall ensure that adequate security measures have been taken to protect the IMEI against duplication, unauthorized removal, or change. The IMEI number of the device shall be available in the latest updated IMEI database of the GSMA. In the case of the CMT having more than one SIM, if each SIM is associated with its transceiver, then each transceiver/SIM slot shall have its associated IMEI number.
3	User manual	Each CMT shall be packed with an instruction manual

PART 7: Technical Requirements

7.1 SIM Card Format and Dimension

Each CMT shall be capable of using at least one of the following SIM card formats with the specified standard reference.

SIM Card format	Standard reference	Length	Width	Thickness
Mini-SIM (2FF)	ISO/IEC 7810:2003, ID-000	25 mm (0.98 in)	15 mm (0.59 in)	0.76 mm (0.030 in)
Micro-SIM (3FF)	ETSI TS 102 221 V9.0.0, Mini-UICC	15 mm (0.59 in)	12 mm (0.47 in)	0.76 mm (0.030 in)
Nano-SIM (4FF)	ETSI TS 102 221 V11.0.0	12.3mm (0.48 in)	8.8 mm (0.35 in)	0.67 mm (0.026 in)
Embedded SIM (eSIM)	ETSI TS 102.671 V9.0.0, JEDEC Design Guide 4.8, SON-8 GSMA SGP.22 V1.0	6 mm (0.24 in)	5 mm (0.20in)	<0.65 mm (0.026 in)

7.2 Keypad

Any keypad used in 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.

7.3 Headset Interfaces

Each CMT with a wired headset interface designed for communication and audio playing shall comply with the requirements as specified in the recommendation ITU-T P.381. The wired interface shall be a headphone jack having a diameter of 3.5 mm. CMT with wired headset interfaces, that do not incorporate 3.5mm jack shall use a USB based interface or any other proprietary interface. In case a CMT incorporates a wireless interface, the interfaces shall comply with minimum technical specifications for short-range devices issued by TCRA.

7.4 Power and Battery Requirements:

This part of requirements shall apply specifically to a category of CMT which is mobile phone. Other CMTs which are not mobile phones may not need to meet these requirements.

S/N	Requirement	Details
1.	The AC Adaptor	Shall comply with ITU-T Recommendation ITU-T Rec. L.1000
2.	Charging system and battery safety	Shall be handled in existing standards, at minimum, IEEE 1725 which establishes criteria for design analysis for quality and reliability of rechargeable Li-Ion and Li-Ion polymer batteries for mobile terminal applications
3.	Charging connector, terminals, ports, and cables	The detachable cables used for charging shall support any of the USB type - A, B and C connectors. The cables and connectors shall meet the requirements as specified in the recommendation ITU-T Rec. L.1000 In addition to Charging from detachable cables, inductive wireless charging standard may be used as an optional requirement
4.	Charging Voltage and Current	DC voltage of at least 5.0 V \pm 5% and input current of at least 500mA shall be used to charge batteries
5.	Battery Standby/talk time	The battery should offer at least eight (8) hours talk-time and 24 hours of standby time

7.5 Operating Frequencies

The following shall be the frequency bands for which CMT shall be allowed to operate;-

Receive Frequency	Transmit Frequency
758 MHz - 788 MHz	703 MHz - 733 MHz
925 MHz - 960 MHz	880 MHz - 915 MHz

791 MHz – 821 MHz	832 MHz – 862 MHz
1805 MHz - 1880 MHz	1710 MHz - 1785 MHz
2110 MHz - 2170 MHz	1920 MHz - 1980 MHz
2300 MHz – 2400 MHz	2300 MHz – 2400 MHz
2570 MHz – 2620 MHz	2570 MHz – 2620 MHz
2620 MHz – 2690 MHz	2500 MHz – 2570 MHz
3300 MHz – 3700 MHz	3300 MHz – 3700 MHz

The precise operating frequency range of a CMT and the corresponding technology shall follow that of the network operator from whom the service is obtained.

Note: Frequency allocations can change and this information should be checked with TCRA.

7.6 Radio Interfaces Requirements

Suppliers shall demonstrate that each CMT has been tested and certified for operating in any of the frequency bands stated in clause 7.5, and comply to any, or a combination of the standards and recommendations in the table below: -

Cellular Network Technology	Reference standard	ITU-R Recommendation
GSM	ETSI EN 301 511	
IMT-2000	ETSI EN 301 908-01 and ETSI EN 301 908-02	ITU-R M.1457-14
IMT-Advanced	ETSI EN 301 908-01 and ETSI EN 301 908-13	ITU-R M.2012-4
IMT 2020	ETSI EN 301 908-01 and EN 301 908-25	ITU-R M.2083-0

7.7 Environment, Health and Safety Requirements

S/N	Requirement	Details
1.	General Safety	<p>Each CMT shall be accessed to make sure that they comply with safety requirements as specified in IEC 60950-1 or IEC/EN 62368-1</p> <p>The assessment shall be made under assumptions that CMT is powered by a dedicated external power supply (charger/power adapter) and operates with SELV in environments where overvoltage from telecommunication networks is not possible. SELV refers to voltages not exceeding 42.4V peak or 60V DC.</p>
2.	Radiation safety requirements (SAR)	The CMT shall be tested and certified for conformity with the IEEE/ANSI and INCNIP SAR standards limits. The testing should be according to IEEE 1528, OET 65, IEC 62209-1, IEC 62209-

		2, EN 50360, EN 50361, EN 50364, and EN 62232.
		The SAR limit for CMT shall be 2W/kg averaged over the 10g of tissue absorbing the most signal
		Where applicable, the supplier of CMT shall provide the SAR information in printed form or other appropriate forms such as in the user guide or as a leaflet or brochure in the equipment package.
3.	Restriction of hazardous substance (RoHS) use.	CMTs which are made with proportions of materials that are hazardous shall be tested and certified for conformity to the standards that govern the restriction for the use of hazardous substances. Under this requirement, the standards IEC 63000 and EN 62321 shall apply.

7.8 Electromagnetic Compatibility

S/N	Requirement	Details
1.	EMC assessment	Each CMT shall be assessed based on standard ETSI EN 301 489-1 and ITU Recommendation ITU-T K.116. The ETSI EN 301 489-1 standard shall be used in conjunction with the ETSI EN 301 489-24 standard for CMT that supports the UTRA and E-UTRA RITs.
2.	EMI or emission measurements	<p>Conducted emission at the DC power port of the CMT intended for vehicular use, shall be measured to Class B requirements defined in CISPR 32</p> <p>Radiated emissions from associated ancillary equipment not incorporated in the CMT shall be measured to Class B requirements defined in CISPR 32</p> <p>Conducted emission at the AC mains port shall be measured for CMT with a dedicated charger or adapter to Class B requirements defined in CISPR 32.</p>
3.	EMS or immunity testing	<p>The following immunity tests may be performed on the CMT to requirements defined in CISPR 24, ITU-T K.116 and ETSI EN 301 489-1 where applicable:</p> <ul style="list-style-type: none"> • RF electromagnetic field (80 MHz to 1 GHz and 1.4 GHz to 6 GHz) at the enclosure of the equipment • Electrostatic discharge at the enclosure of the equipment • Fast transients (common mode) at DC power and AC main power ports that have cables longer than 3 m • RF common mode 0.15 MHz to 80 MHz at DC power and AC mains power ports that have cables longer than 3 m • Transients and surges (vehicular environment) on nominal 12V and 24V DC supply voltage input ports of a mobile

		<p>terminal and ancillary equipment intended also for mobile use in vehicles</p> <ul style="list-style-type: none"> • Voltage dips and interruptions at AC mains power port of mobile or portable terminal with dedicated charger/power adapter surges, common and differential mode at AC mains power port of mobile or portable terminal with dedicated charger/power adapter
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7.9 Other Technical Requirements

If the CMT supports other wireless modes of operation such as WLAN, Bluetooth, NearField Communications, and Inductive Wireless Charging, manufactures and suppliers shall demonstrate that the CMT has been tested and certified for conformity to the relevant requirements as given in TCRA technical specification for Short Range Devices (SRD).

PART 8: Testing and Certification Requirements

Each CMT shall comply with these minimum technical specifications and other national and international standards accepted and adopted in our country.

PART 9: Document Administration

9.1 Amendment

TCRA may from time-to-time, review, and update or modify this document to ensure its continued service and to meet the international and/or national performance requirements as necessary

9.2 Compliance

This document shall comply with appropriate provisions of the TCRA Act, 2003, the Electronic and Postal Communications Act, 2010 and the Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020 and effective from the date it has been published.

9.3 Publication

This document shall be published on the TCRA website <https://www.tcra.go.tz> for public information, compliance and reference purposes.