

अनिवार्य आवश्यकताएं

ESSENTIAL REQUIREMENTS

सं.: टी.ई.सी./ई.आर./एम.टी./एम.यू.ई.-००१/०१/अप्रैल २०१८

No. : TEC/ER/MT/MUE-001/01/APRIL 2018

Mobile User Equipment

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Table of Contents

Scope.....	4
History	5
Applicability Matrix.....	6
1 EMI/ EMC Requirements	7
2 Safety Requirements	8
3 Security Requirements	9
4 Technical Requirements	10
4.1 Technical Requirements for GSM/GPRS/EDGE	10
4.2 Technical Requirements for WCDMA/HSPA.....	12
4.3 Technical Requirements for LTE/LTE-A.....	13
4.4 Technical Requirements for CDMA 2000	14
4.5 Technical Requirements for WiFi, Bluetooth	15
5 Other Requirements	16
References.....	19
Glossary	21

Scope

This document lays down the Essential Requirements under the mandatory testing Framework in accordance with Government of India Gazette Notification No. G.S.R. 1131(E), dated 05th September 2017, for Mobile User Equipment (which refers to devices primarily used for voice communication using cellular connectivity) and data-card and dongle to be used in Indian Telecom Network using 2G/3G/4G technology. The handsets may also support WiFi, Bluetooth which will need to be certified against the technical requirements in the appropriate ER.

The document defines the mandatory testing requirements for certification under the MT&CTE framework.

This ER covers following variants of the product:

Name of Product	Variant(s)
Mobile User Equipment	<ol style="list-style-type: none">1. Supporting GSM/GPRS/EDGE2. Supporting CDMA 20003. Supporting UMTS4. Supporting LTE/LTE-A5. Any combination of 1-4 with/without 6,7.6. Supporting WiFi7. Supporting Bluetooth

History

S. No.	Name of the Product	ER Number	Remarks
1.	Mobile User Equipment	TEC/ER/MT/MUE-001/01/APRIL 2018	New ER Release Date - _/04/2018

Applicability Matrix

Product Variants/Interfaces	GSM	GPRS	EDGE	CDMA 2000	WCDMA	LTE	WiFi	Bluetooth
Phone								
Data Card/Dongle								

1 EMI/ EMC Requirements

(These requirements shall be as per TEC Standard No. **TEC/SD/DD/EMC-221/05.OCT-16** as modified/ amended from time to time)

Clause	Parameter	Standard	Limits/ Results expected
1.1	Conducted and Radiated Emission	CISPR 22 (2008) OR CISPR 32 Class-B	Compliance
1.2	Immunity to Electrostatic discharge: Contact discharge level 2 { ± 4 kV}	IEC-61000-4-2 Performance Criteria-B, Clause 9	Compliance
1.3	Immunity to Electrostatic discharge: Air discharge level 3 { ± 8 kV}	IEC-61000-4-2 Performance Criteria-B, Clause 9	Compliance
1.4	Immunity to radiated RF: (a) Radio Frequency: 80 MHz to 1 GHz, Electromagnetic field: 3V/m (b) Radio Frequency: 800 MHz to 960 MHz, Electromagnetic field: 10V/m (c) Radio Frequency: 1.4 GHz to 6 GHz, Electromagnetic field: 10V/m	IEC 61000-4-3 (2010); Performance Criteria-A, Clause 9	Compliance

2 Safety Requirements

Clause	Parameter	Standard	Limits/ Results expected
2.1.	Radiation Safety (SAR)		
2.1.1.	SAR value: 1.6 W/Kg averaged over 1 gm tissue.	For Mobile Handset: SAR measurement Standards TEC/GR/SAR/001/01.M AR.09 OR IEC Standard 62209-1:2005 For Dongle/Data Cards: IEC Standard 62209-2:2005	Compliance
2.1.2.	Display the single worst case value of SAR	Request using MMI string code *#07#.	Value to be < 1.6 W/Kg averaged over 1 gm tissue. Compliance
2.2.	Safety Requirement for Batteries	IS 16046: 2012 (equivalent to IEC 62133:2002)	Compliance
2.3.	The equipment shall conform to IS 13252 part 1:2010- "Information Technology Equipment – Safety- Part 1: General Requirements" [equivalent to IEC 60950-1 {2005} "Information Technology Equipment –Safety- Part 1: General Requirements"] Or IEC 62368-I:2014	IS 13252 part 1:2010 / IEC 60950-1 {2005} part 1; or IEC 62368-I:2014	Compliance

3 Security Requirements

Clause	Parameter	Standard	Limits/ Results expected
Under finalisation by DOT Security Wing			

4 Technical Requirements

4.1 Technical Requirements for GSM/GPRS/EDGE

Clause	Parameter	Standard	Limits/ Results expected
4.1.1.	Operating Frequency Mobile User Equipment shall be capable of operating in at least one of the frequency bands as per the National Frequency Allocation Plan.	Applicable National Frequency Allocation Plan	Compliance
4.1.2.	Transmitter Maximum output power	For GSM: 3GPP TS 51 010-1 Clause 13.3 OR EN 301 511 (GSM) Clause 4.2.5 For GPRS: 3GPP TS 51 010-1 Clause 13.16.2 OR EN 301 511 (GSM) Clause 4.2.10	Compliance
4.1.3.	Output RF Spectrum	3GPP TS 51 010-1 Clause 13.4 OR EN 301 511 (GSM) Clause 4.2.6 For GPRS: 3GPP TS 51 010-1 Clause 13.16.3 OR EN 301 511 (GSM) Clause 4.2.11	Compliance
4.1.4.	Spurious emissions (MS allocated a channel)	3GPP TS 51 010-1 Clause 12.1.1 OR EN 301 511 (GSM) Clause 4.2.12	Compliance
4.1.5.	Spurious emission (MS in idle mode)	3GPP TS 51 010-1 Clause 12.1.2 OR EN 301 511 (GSM) Clause 4.2.13	Compliance
4.1.6.	Frequency Error and phase error	3GPP TS 51 010-1 Clause 13.1 OR EN 301 511 (GSM) Clause 4.2.1 GPRS:3GPP TS 51 010-1 Clause 13.16.1 OR	Compliance

		EN 301 511 (GSM) Clause 4.2.4	
4.1.7.	Reference sensitivity level (speech channels)	3GPP TS 51 010-1 Clause 14.2.1 0R EN 301 511 (GSM) Clause 4.2.42	Compliance
4.1.8.	Adjacent Channel Rejection (speech channels)	3GPP TS 51 010-1 Clause 14.5.1 0R EN 301 511 (GSM) Clause 4.2.38	Compliance
4.1.9.	Receiver blocking	3GPP TS 51 010-1 Clause 14.7.1 0R EN 301 511 (GSM) Clause 4.2.20	Compliance

4.2 Technical Requirements for WCDMA/HSPA

Clause	Parameter	Standard	Limits/ Results expected
4.2.1.	Operating Frequency Mobile User Equipment shall be capable of operating in at least one of the frequency bands as per the National Frequency Allocation Plan.	Applicable National Frequency Allocation Plan	Compliance
4.2.2.	Transmitter Maximum output power	3GPP TS 34.121-1 Clause 5.2 OR EN 301 908-2 (UMTS) Clause 4.2.2	Compliance
4.2.3.	Transmitter Spectrum emissions mask	3GPP TS 34.121-1 Clause 5.9 OR EN 301 908-2 (UMTS) Clause 4.2.3	Compliance
4.2.4.	Transmitter spurious emissions	3GPP TS 34.121-1 Clause 5.11 OR EN 301 908-2 (UMTS) Clause 4.2.4	Compliance
4.2.5.	Receiver spurious emission	3GPP TS 34.121-1 Clause 6.8 OR EN 301 908-2 (UMTS) Clause 4.2.10	Compliance
4.2.6.	Transmitter Minimum Output Power	3GPP TS 34.121-1 Clause 5.4.3 OR EN 301 908-2 (UMTS) Clause 4.2.5	Compliance
4.2.7.	Receiver Reference sensitivity level	3GPP TS 34.121-1 Clause 6.2 OR EN 301 908-2 (UMTS) Clause 4.2.13	Compliance
4.2.8.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 34.121-1 Clause 6.4 OR EN 301 908-2 (UMTS) Clause 4.2.6	Compliance
4.2.9.	Receiver In-band blocking	3GPP TS 34.121-1 Clause 6.5.2.1 OR EN 301 908-2 (UMTS) Clause 4.2.7	Compliance

4.3 Technical Requirements for LTE/LTE-A

Clause	Parameter	Standard	Limits/ Results expected
4.3.1.	Operating Frequency Mobile User Equipment shall be capable of operating in at least one of the frequency bands as per the National Frequency Allocation Plan.	Applicable National Frequency Allocation Plan	Compliance
4.3.2.	Maximum output power	3GPP TS 36.521-1 Clause 6.2.2 OR EN 301 908-13 (LTE) Clause 4.2.2	Compliance
4.3.3.	Spectrum emissions mask	3GPP TS 36.521-1 Clause 6.6.2.1 OR EN 301 908-13 (LTE) Clause 4.2.3	Compliance
4.3.4.	Spurious emissions	3GPP TS 36.521-1 Clause 6.6.3.1, 6.6.3.2, 6.6.3.3 OR EN 301 908-13 (LTE) Clause 4.2.4	Compliance
4.3.5.	Receiver spurious emission	3GPP TS 36.521-1 Clause 7.9 OR EN 301 908-13 (LTE) Clause 4.2.10	Compliance
4.3.6.	Receiver Reference Sensitivity level	3GPP TS 36.521-1 Clause 7.3 OR EN 301 908-13 (LTE) Clause 4.2.12	Compliance
4.3.7.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 36.521-1 Clause 7.5 OR EN 301 908-13 (LTE) Clause 4.2.6	Compliance
4.3.8.	Receiver In-band blocking	3GPP TS 36.521-1 Clause 7.6.1 OR EN 301 908-13 (LTE) Clause 4.2.7	Compliance

4.4 Technical Requirements for CDMA 2000

Clause	Parameter	Standard	Limits/ Results expected
4.4.1.	Operating Frequency Mobile User Equipment shall be capable of operating in at least one of the frequency bands as per the National Frequency Allocation Plan.	Applicable National Frequency Allocation Plan	Compliance
4.4.2.	Transmitter Maximum output power	1x: S0011 Clause 4.4.5 0R EN 301 908-04 (CDMA) Clause 4.2.3	Compliance
4.4.3.	Transmitter Spectrum emissions mask	1x: S0011 Clause 4.5.1 0R EN 301 908-04 (CDMA) Clause 4.2.2	Compliance
4.4.4.	Transmitter spurious emissions in active mode (Conducted)	1x: S0011 Clause 4.5.1 0R EN 301 908-04 (CDMA) Clause 4.2.2	Compliance
4.4.5.	Receiver spurious emission in idle mode (Conducted)	1x: S0011 Clause 3.6 0R EN 301 908-04 (CDMA) Clause 4.2.5	Compliance
4.4.6.	Receiver Adjacent Channel Selectivity (ACS)	EN 301 908-04 (CDMA) Clause 4.2.8	Compliance
4.4.7.	Receiver In-band blocking	EN 301 908-04 (CDMA) Clause 4.2.6	Compliance

4.5 Technical Requirements for WiFi, Bluetooth

Clause	Parameter	Standard	Limits/ Results expected
4.5.1.	Support for WiFi (with/without Hotspot facility)	Clauses under Technical Requirements from ER for Unlicensed Band	Compliance
4.5.2.	Support for Bluetooth	Clauses under Technical Requirements from ER for Bluetooth	Compliance

5 Other Requirements

Clause	Parameter	Standard	Limits/ Results expected
5.1.	Identification of Equipment for GSM/UMTS/LTE		
	'International Mobile Station Equipment Identity (IMEI)' The Handset shall not be with all zeroes/null/invalid IMEI.	GSMA Official Document - IMEI Allocation and Approval Process Test Procedure: a. Press *#06# to get IMEI. b. Check that IMEI is not all zeroes/null.	Compliance
5.2.	Identification of Equipment for CDMA 2000		
	'Mobile Equipment Identifier (MEID/ESN)' - The Handset shall not be with all zeroes/null MEID/ESN.	Similar procedure as in Clause 5.1 above.	Compliance
5.3.	Support for Emergency Services		
i.	Panic button in all mobile handsets	Government of India Gazette Notification No. G.S.R. No. 436 (E) dated 22-04-2016 Test Procedure: a) For Feature phones without the facility of panic button: Test that by pressing "Numeric key -5" or "numeric key -9 invokes emergency call. b) For Smart phones: Test that emergency call is invoked: i. with the facility of soft emergency call button by pressing it for long time;	Compliance

		<p>ii. by short pressing existing power on /off button thrice in quick succession</p> <p>For GSM/UMTS/LTE 3GPP TS 22.101</p> <p>For CDMA 2000, 3GPP2 C.S0023</p> <p>In case of phones (feature as well as smart phones) with panic (red)button test that by pressing the same it invokes emergency call.</p>	
ii.	Facility of identifying the location through satellite based GPS in smart phone handsets	<p>Government of India Gazette Notification No. G.S.R. No. 1441 (E) dated 23-11-2017</p>	Compliance
iii.	Single Emergency number 112 (applicable to Mobile Handset only)	<p>Department of Telecom No. 16-04/2015-AS-III/NP/67/120 dated 04th May 2016</p> <p>For GSM/UMTS/LTE 3GPP TS 22.101 and TS 24.008</p> <p>For CDMA 2000, 3GPP2 C.S0023</p> <p>Test Procedure:</p> <ol style="list-style-type: none"> 1. Test that it is possible to dial the emergency number 112 even if the key pad is locked 2. Test that it is possible to dial the emergency number 112 with or without SIM (subject to implementation) 3. Test that an UE/ME which has not successfully registered shall nevertheless be able to make emergency call attempts on an available PLMN (which supports the emergency call tele-service), without the need 	

		for the user to select a PLMN.	
5.4.	Support for Indian Language (applicable to Mobile Handset only)	IS 16333 (Part 3)	Compliance
5.5.	IPv6 Compliance Mobile User Equipment shall be capable of carrying IPv6 traffic either on dual stack or on native IPv6'	For IPv6: RFC 2460: Clause no. 3, 4.1, 4.2, 4.3, 4.4 For Dual stack: RFC 4213: Clause 2.1 & Clause 2.2 (Note: Date of implementation will be as per DOT policy)	Compliance

References

S. No.	Document Reference	Document Title
1.	TEC/SD/DD/EMC-221/05/ OCT-16	Electromagnetic Compatibility Standard for Telecommunication Equipment
2.	CISPR 22 (2008)	Limits and methods of measurement of radio disturbance characteristics of Information Technology equipment
3.	CISPR 32 (2015)	Electromagnetic compatibility of multimedia equipment - Emission requirements
4.	IEC 61000-4-2 (2008)	Testing and measurement techniques of Electrostatic discharge immunity test
5.	IEC 61000-4-3 (2010)	Radiated RF Electromagnetic Field Immunity test
6.	IS 13252 part 1: 2010 Amd 2013 & Amd 2015	Information Technology Equipment –Safety- Part 1: General Requirements
7.	IEC 60950-1:2005+A1: 2009 +A2: 2013	Information Technology Equipment –Safety- Part 1: General Requirements
8.	IEC 62368: 2014	Audio/video, information and communication technology equipment - Part 1: Safety requirements
9.	3GPP TS 51.010-1	Mobile Station (MS) conformance specification; Part 1: Conformance specification
10.	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
11.	3GPP TS 34.121-1	User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification
12.	ETSI EN 301 908-2	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)
13.	3GPP TS 36.521-1	Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing
14.	ETSI EN 301 908-13	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
15.	C.S0011	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations

16.	ETSI EN 301 908-4	Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) and Evolved CDMA Multi-Carrier Ultra Mobile Broadband (UMB) (UE) covering the essential requirements of article 3.2 of the R&TTE Directive
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Glossary

BSS	Base Station Subsystem
CAB	Conformance Assessment Body
CDMA	Code Division Multiple Access
CISPR	Comité International Spécial des Perturbations Radioélectriques
EIR	Equipment Identity Register
EMC	Electromagnetic Compatibility
ER	Essential Requirements
ETSI	European Telecommunications Standards Institute
EUT	Equipment Under Test
GHz	Giga Hertz
GSM	Global System for Mobile
GSR	General Statutory Rules
HSPA	High Speed Packet Access
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity
IPv6	Internet Protocol version 6
MHz	Mega Hertz
ms	millisecond
LTE	Long Term Evolution
LTE-A	Long Term Evolution - Advanced
MSR	Multi Standard Radio
MTCTE	Mandatory Testing and Certification of Telecom Equipment
NFAP	National Frequency Allocation Plan
TEC	Telecommunication Engineering Centre
WCDMA	Wideband Code Division Multiple Access
WPC	Wireless Planning & Coordination

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