

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.

Matrix

<u>Product Variants/Interfaces</u>	<u>GSM</u>	<u>GPRS</u>	<u>EDGE</u>	<u>CDMA 2000</u>	<u>WCDMA</u>	<u>LTE</u>	<u>WiFi</u>	<u>Bluetooth</u>
Feature Phone								
Smart Phone								
Data Card/Dongle								

1 EMI/ EMC Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
1.0	EMI/ EMC	As Per TEC Standard No. TEC/SD/DD/EMC-221/05.OCT-16 as modified from time to time		
1.1	Conducted and Radiated Emission The values of limits shall be as per TEC Standard No. TEC/SD/DD/EMC-221/05.OCT-16 as modified from time to time	CISPR 22 (2008) or CISPR 32 Class-A	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: 1. Radio Frequency: 80 MHz to 1 GHz, Electromagnetic field: 3V/m	IEC 61000-4-3 (2010); Performance Criteria-A, Clause 9	Compliance	

	<p>2. Radio Frequency: 800 MHz to 960 MHz, Electromagnetic field: 10V/m</p> <p>3. Radio Frequency: 1.4 GHz to 6 GHz, Electromagnetic field: 10V/m</p>			
1.5	<p>Immunity to fast transients (burst): Test Level 2:</p> <p>a) 1 kV for AC/DC power port</p> <p>b) 0.5 kV for signal / control / data / telecom lines.</p>	<p>IEC 61000- 4- 4 {2012};</p> <p>Performance Criteria-B, Clause 9</p>	Compliance	
1.6	<p>Immunity to surges: AC/DC ports</p> <p>1.1 (a) 2 kV peak open circuit voltage for line to ground</p> <p>1.2 (b) 1kV peak open circuit voltage for line to line</p>	<p>IEC 61000-4-5 (2014)</p> <p>Performance Criteria-B, Clause 9</p>	Compliance	
1.7	<p>Immunity to surges: Telecom lines/</p> <p>(a) 2 kV peak open circuit voltage for line to ground coupling.</p> <p>(b) 2 kV peak open circuit voltage for line to line coupling.</p>	<p>IEC 61000-4-5 (2014)</p> <p>Performance Criteria-B, Clause 9</p>	Compliance	

1.8	<p>Immunity to conducted disturbance induced by Radio frequency fields:</p> <p>Under the test level 2 {3 V r.m.s.} in the frequency range 150 kHz-80 MHz for AC / DC lines and Signal /Control/telecom lines.</p>	<p>IEC 61000-4-6 (2013)</p> <p>Performance Criteria-A, Clause 9</p>	Compliance	
1.9	<p>Immunity to voltage dips & short interruptions (applicable to only ac mains power input ports, if any):</p> <p>Limits: -</p> <p>a. a voltage dip corresponding to a reduction of the supply voltage of 30% for 500ms (i.e. 70 % supply voltage for 500ms)</p> <p>b. a voltage dip corresponding to a reduction of the supply</p>	<p>IEC 61000-4-11 (2004):</p> <p>a. Performance Criteria B for Reduction of Supply 30% for 500ms or Dip to reduction of 60% for 100ms</p> <p>b. Performance Criteria C for Reduction of 60% for 200ms</p> <p>c. Performance criteria C for Voltage Interruption>95% for 5 s</p> <p>(Note: In case of Battery back-up performance criteria A is applicable).</p> <p>d. Performance Criteria B for Voltage Interruption >95% duration :10ms</p>	Compliance	

	<p>voltage of 60% for 200ms; (i.e. 40% supply voltage for 200ms)</p> <p>c. a voltage interruption corresponding to a reduction of supply voltage of > 95% for 5s.</p> <p>d. a voltage interruption corresponding to a reduction of supply voltage of >95% for 10ms.</p>	<p>Note: In case of Battery back-up Performance Criteria A is applicable for above conditions.</p>		
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2 Safety Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
2.0	Safety Requirements			
2.1	Radiation Safety (SAR) Requirements			
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.MAR.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	<p>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</p>	<p>IS 13252 part 1:2010 / IEC 60950-1 {2005} part 1; or IEC 62368-I:2014</p>	Compliance	
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3 Security Requirements: **As per Security Requirements finalised by Security wing of DoT**

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4 Technical Requirements

4.1 Technical Requirements for GSM

Clause	Parameter	Standard	Limits/ Results expected	Results
4.1.1.	Operating Frequency Mobile devices shall be capable of at least operating in the following frequency bands. GSM: 1710-1785 MHz (U/L) and 1805-1880 MHz (D/L) GSM: 890-915 MHz (U/L) and 935-960 MHz (D/L)	Current National Frequency Allocation Plan	Compliance	
4.1.2.	Transmitter Maximum output power	For GSM: TS 51 010-1 13.3 For GPRS: TS 51 010-1 13.16.2 OR EN 301 511 (GSM) 4.2.10	Compliance	
4.1.3.	Output RF Spectrum	3GPP TS 51 010-1 13.4 OR EN 301 511 (GSM) 4.2.6	Compliance	
4.1.4.	Transmitter spurious emissions in active mode (Conducted)	3GPP TS 51 010-1 12.1.1 OR EN 301 511 (GSM) 4.2.12	Compliance	
4.1.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 51 010-1 12.1.2 OR EN 301 511 (GSM) 4.2.13	Compliance	
4.1.6.	Frequency Stability	3GPP TS 51 010-1 13.1 OR	Compliance	

		EN 301 511 (GSM) 4.2.1		
4.1.7.	Receiver Reference sensitivity level	3GPP TS 51 010-1 14.2.1 OR EN 301 511 (GSM)	Compliance	
4.1.8.	Adjacent Channel Rejection	3GPP TS 51 010-1 14.5.1 OR EN 301 511 (GSM)	Compliance	
4.1.9.	Receiver blocking	3GPP TS 51 010-1 14.7.1 OR EN 301 511 (GSM) 4.2.20	Compliance	

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4.2 Technical Requirements for WCDMA/HSPA

Clause	Parameter	Standard	Limits/ Results expected	Results
4.2.1.	<p>Operating Frequency</p> <p>Mobile devices shall be capable of at least operating in the following frequency bands. WCDMA: 1920-1980 MHz (U/L) and 2110-2170 MHz (D/L) WCDMA: 890-915 MHz (U/L) and 935-960 MHz (D/L)</p>	Current National Frequency Allocation Plan	Compliance	
4.2.2.	Transmitter Maximum output power	3GPP TS 34.121-1 5.2 OR EN 301 908-2 (UMTS) 4.2.2	Compliance	
4.2.3.	Transmitter Spectrum emissions mask	3GPP TS 34.121-1 5.9 OR EN 301 908-2 (UMTS) 4.2.3	Compliance	
4.2.4.	Transmitter spurious emissions in active mode (Conducted)	3GPP TS 34.121-1 5.11 OR EN 301 908-2 (UMTS) 4.2.4	Compliance	
4.2.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 34.121-1 6.8 OR EN 301 908-2 (UMTS) 4.2.10	Compliance	
4.2.6.	Frequency Stability	3GPP TS 34.121-1 5.3 OR EN 301 908-2 (UMTS)	Compliance	
4.2.7.	Transmitter Minimum Output Power	3GPP TS 34.121-1 5.4.3 OR EN 301 908-2 (UMTS) 4.2.5	Compliance	
4.2.8.	Receiver Reference sensitivity level	3GPP TS 34.121-1 6.2 OR EN 301 908-2 (UMTS) 4.2.13	Compliance	

4.2.9.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 34.121-1 6.4 OR EN 301 908-2 (UMTS) 4.2.6	Compliance	
4.2.10.	Receiver In-band blocking	3GPP TS 34.121-1 6.5.2.1 OR EN 301 908-2 (UMTS) 4.2.7	Compliance	

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4.3 Technical Requirements for LTE/LTE-A

Clause	Parameter	Standard	Limits/ Results expected	Results
4.3.1.	<p>Operating Frequency</p> <p>Mobile devices shall be capable of operating in one or more of the following frequency bands.</p> <p>LTE(FDD): 824 – 849 MHz (U/L) and 869 – 894 MHz (D/L)</p> <p>LTE(FDD):890-915 MHz (U/L) and 935-960 MHz (D/L)</p> <p>LTE(FDD): 1710-1785 MHz (U/L) and 1805-1880 MHz (D/L)</p> <p>LTE (FDD): 1920-1980 MHz (U/L) and 2110-2170 MHz (D/L)</p> <p>LTE (TDD): 2300 – 2400 MHz</p> <p>LTE (TDD): 2496 – 2690 MHz</p>	Current National Frequency Allocation Plan	Compliance	
4.3.2.	Transmitter Maximum output power	3GPP TS 36.521-1 6.2.2 0R EN 301 908-13 (LTE) 4.2.2	Compliance	
4.3.3.	Transmitter Spectrum emissions mask	3GPP TS 36.521-1 6.6.2.1 0R EN 301 908-13 (LTE) 4.2.3	Compliance	
4.3.4.	Transmitter spurious emissions in active mode (Conducted)	3GPP TS 36.521-1 6.6.3.1, 6.6.3.2, 6.6.3.3 0R EN 301 908-13 (LTE) 4.2.4	Compliance	
4.3.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 36.521-1 7.9 0R EN 301 908-13 (LTE) 4.2.10	Compliance	

4.3.6.	Frequency Stability	3GPP TS 36.521-1 6.5 OR EN 301 908-13 (LTE)	Compliance	
4.3.7.	Power Control Absolute power tolerance	3GPP TS 36.521-1 6.3.5.1 OR EN 301 908-13 (LTE)	Compliance	
4.3.8.	Receiver Reference sensitivity level	3GPP TS 36.521-1 7.3 OR EN 301 908-13 (LTE) 4.2.12	Compliance	
4.3.9.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 36.521-1 7.5 OR EN 301 908-13 (LTE) 4.2.6	Compliance	
4.3.10.	Receiver In-band blocking	3GPP TS 36.521-1 7.6.1 OR EN 301 908-13 (LTE) 4.2.7	Compliance	

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4.4 Technical Requirements for CDMA 2000

Clause	Parameter	Standard	Limits/ Results expected	Results
4.4.1.	Operating Frequency Mobile devices shall be capable of at least operating in the following frequency bands. CDMA: 824-844 MHz (U/L) and 869-889 MHz (D/L)	Current National Frequency Allocation Plan	Compliance	
4.4.2.	Transmitter Maximum output power	1x: S0011 4.4.5 OR EN 301 908-04 (CDMA) 4.2.3	Compliance	
4.4.3.	Transmitter Spectrum emissions mask	1x: S0011 4.5.1 OR EN 301 908-04 (CDMA) 4.2.2	Compliance	
4.4.4.	Transmitter spurious emissions in active mode (Conducted)	1x: S0011 4.5.1 OR EN 301 908-04 (CDMA) 4.2.2	Compliance	
4.4.5.	Receiver spurious emission in idle mode (Conducted)	1x: S0011 3.6 OR EN 301 908-04 (CDMA) 4.2.5	Compliance	
4.4.6.	Frequency Stability	1x: S0011 4.1 OR EN 301 908-04 (CDMA)	Compliance	
4.4.7.	Receiver Reference sensitivity level	EN 301 908-04 (CDMA)	Compliance	
4.4.8.	Receiver Adjacent Channel Selectivity (ACS)	EN 301 908-04 (CDMA) 4.2.8	Compliance	
4.4.9.	Receiver In-band blocking	EN 301 908-04 (CDMA) 4.2.6	Compliance	

4.5 Technical Requirements for WiFi, Bluetooth

Clause	Parameter	Standard	Limits/ Results expected	Results
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	

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5 Other Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
5.0.	Identification of Equipment for GSM/UMTS/LTE			
a)	<p>i. The Mobile Terminal shall be marked with the manufacturer's brand identification mark, and the manufacturer's model or type reference. The markings required shall be legible, indelible and readily visible.</p> <p>ii. 'International Mobile Station Equipment Identity (IMEI)' The Handset shall not be with all zeroes/null IMEI.</p>	<p>Department of Telecommunication No. 20-40/2006-BS-III(Pt.)(Vol.I)201 dated 3rd September 2009 and GSMA Official Document - IMEI Allocation and Approval Process Test Procedure:</p> <p>a. Check physically for manufacturer's brand identification mark, and the manufacturer's model or type reference and check that markings required are legible, indelible and readily visible.</p> <p>b. Press *#06# to get IMEI.</p> <p>c. Check that IMEI is not all zeroes/null.</p>	Compliance	
5.1.	Identification of Equipment for CDMA 2000			

	<p>i. The Mobile Terminal shall be marked with the manufacturer's brand identification mark, and the manufacturer's model or type reference. The markings required shall be legible, indelible and readily visible.</p> <p>ii. 'Mobile Equipment Identifier (MEID/ESN)' - The Handset shall not be with all zeroes/null MEID/ESN.</p>	<p>Department of Telecommunication No. 20-40/2006-BS-III(Pt.)(Vol.I)201 dated 3rd September 2009</p> <p>Test Procedure:</p> <p>a. Check physically for manufacturer's brand identification mark, and the manufacturer's model or type reference and check that markings required are legible, indelible and readily visible.</p> <p>b. Press *#06# to get MEID/ESN.</p> <p>c. Check that MEID/ESN is not all zeroes/null.</p>	Compliance	
5.2.	Support for Emergency Services			
a)	Panic button in all mobile handsets	<p>Government of India Gazette Notification No. G.S.R. No. 1441 (E) dated 23-11-2017</p> <p>Test Procedure:</p> <p>Test that the feature phone without the facility of panic button by pressing "Numeric key -5" or "numeric key -9 to</p>	Compliance	

		<p>invoke emergency call (112). Test smart phones that emergency call (112) is invoked:</p> <p>a) with the facility of soft emergency call button by pressing it for long time or</p> <p>b) by short pressing existing power on /off button thrice in quick succession</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 (112)</p>		
b)	GPS in new smart mobile handsets	Government of India Gazette Notification No. G.S.R. No. 1441 (E) dated 23-11-2017	Compliance	
5.1.1	Single Emergency number 112	<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> <p>1. Test that it is possible to dial the emergency number 112 even if the key pad is locked</p>		

		<p>2. Test that it is possible to dial the emergency number 112 with or without SIM (subject to implementation)</p> <p>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.</p>		
5.3.	Support for Indian Language	Government of India Gazette Notification No. G.S.R. No. 2357 (E) along with subsequent notifications.	Compliance	
5.4.	IPv6 Compliance	As per latest DoT order	Compliance	