

ER for End Point Device for Environment Monitoring

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 End Point Device for Environment monitoring etc to be used in Indian Telecom Network using GSM /CDMA 2000/WCDMA/LTE/ LTE-A technology and with Normal SIM / Embedded SIM.

Product Matrix: -

Product/ Variant	GSM	CDMA 2000	WCDMA	LTE/ LTE-A
Co2 Monitoring	Yes	Yes	Yes	Yes
No2 Monitoring etc.	Yes	Yes	Yes	Yes
Temperature Monitoring	Yes	Yes	Yes	Yes

1. EMI/ EMC Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
1.	EMI/ EMC Conducted and Radiated Emission	CISPR 22 (2008) Class A or B, CISPR 32	As Per TEC Standard No.TEC/SD/DD/EMC-221/05.OCT- 16 as modified from time to time	
1.1	Immunity to Electrostatic discharge: Contact discharge level 2 { \pm 4 kV} or higher voltage;	IEC-61000-4-2	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.2	Immunity to Electrostatic discharge: Air discharge level 3 { \pm 8 kV} or higher voltage.	IEC-61000-4-2	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.3	Immunity to radiated RF: Under Test level 2 {Test field strength of (i) 3 V/m for domestic and (ii) 10 V/m for commercial} in frequency range 80 MHz to 1000 MHz and for protection against digital radio telephones and other RF devices in frequency ranges 800 MHz to 960 MHz and 1.4 GHz to 6.0 GHz.	IEC 61000-4-3 (2010)	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.4	Immunity to fast transients (burst): Test Level 2: b) 0. 5 kV for signal / control / data / telecom lines.	IEC 61000- 4- 4 (2012)	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	

Clause	Parameter	Standard	Limits/ Results expected	Results
1.5	Immunity to surges: (a) 2 kV peak open circuit voltage for line to ground	IEC 61000-4-5 (2014)	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.6	Immunity to surges: (b) 2 kV peak open circuit voltage for line to line coupling.	IEC 61000-4-5 (2014)	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.7	Immunity to conducted disturbance induced by Radio frequency fields: Under the test level 2 {3 V r.m.s.} in the frequency range 150 kHz-80 MHz	IEC 61000-4-6 (2013)	Compliance to Performance Criteria as per Criteria B as per table 1 under Clause 6 of TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	
1.8	Immunity to voltage dips & short interruptions (Applicable to AC mains power inputs ports , if any)	IEC 61000-4-11 (2004):	Compliance to Performance criteria as per Table 3 under Clause 7.2 of As Per TEC Standard No.TEC/SD/DD/ EMC-221/05.OCT- 16.	

2. Safety Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
2.0	Safety Requirements			

Clause	Parameter	Standard	Limits/ Results expected	Results
2.1	Radiation Safety (SAR) Requirements			
2.1.1	SAR value: 1.6 W/Kg averaged over 1 gm tissue.	<p>SAR measurement Standards</p> <p>TEC/GR/SAR/002/01.MAR.09 OR IEC Standard 62209-2:2010</p> <p>SAR (Specific Absorption Rate) Measurement System for wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6 GHz))- TEC/GR/RS/SAR-002/01/JUL 17</p> <p>Note: If the EPD is operating within 20cm from human/ animal body, only then device conformance to SAR is required</p>	Compliance to given standard	
2.2	Safety Requirement for Batteries	IS 16046: 2012 (equivalent to IEC 62133:2002)	Compliance to given standard	

Clause	Parameter	Standard	Limits/ Results expected	Results
2.3	General Safety Requirement	IS 13252 part 1:2010 / IEC 60950- 1{2005} part1; or IEC 62368-1:2014	Compliance to given standard	

3. Security Requirements

As per Security Requirements finalised by Security wing of DoT

4. Technical Requirements

4.1 Technical Requirement of Environmental End Point Devices (EPD) for GSM-

Clause	Parameter	Standard	Limits/ Results expected	Results
4.1.1.	Operating Frequency Environmental EPD 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 to given plan	
4.1.2.	Transmitter Maximum output power	For GSM: 3GPP TS 51 010-1 13.3 For GPRS: 3GPP TS 51 010-1 13.3 16.2 OR EN 301 511 (GSM) 4.2.10	Compliance to given standard	
4.1.3.	Output RF Spectrum	3GPP TS 51 010-1 13.4 OR EN 301 511 (GSM) 4.2.6	Compliance to given standard	

Clause	Parameter	Standard	Limits/ Results expected	Results
4.1.4.	Transmitter spurious emissions in active mode (Conducted)	3GPP TS 51 010-1 12.1.1 EN 301 511 (GSM) 4.2.12	Compliance to given standard	
4.1.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 51 010-1 12.1.2 EN 301 511 (GSM) 4.2.13	Compliance to given standard	
4.1.6.	Frequency Stability	3GPP TS 51 010-1 13.1 EN 301 511 (GSM) 4.2.1	Compliance to given standard	
4.1.7.	Receiver Reference sensitivity level	3GPP TS 51 010-1 14.2.1 EN 301 511 (GSM)	Compliance to given standard	
4.1.8.	Receiver Adjacent Rejection	3GPP TS 51 010-1 14.5.1 EN 301 511 (GSM)	Compliance to given standard	
4.1.9.	Receiver blocking	3GPP TS 51 010-1 14.7.1 EN 301 511 (GSM) 4.2.20	Compliance to given standard	

4.2 Technical Requirements of Environmental End Point Devices (EPD) for WCDMA/HSPA

Clause	Parameter	Standard	Limits/ Results expected	Results
4.2.1.	<p>Operating Frequency EPD shall be capable of at least operating in the following frequency bands.</p> <p>WCDMA: 1920-1980 MHz (U/L) and 2110-2170 MHz (D/L)</p> <p>WCDMA: 890-915 MHz (U/L) and 935-960 MHz (D/L)</p>	Current National Frequency Allocation Plan	Compliance to given plan	

Clause	Parameter	Standard	Limits/ Results expected	Results
4.2.2.	Transmitter Maximum output power	3GPP TS 34.121-1 5.2 EN 301 908-2 (UM3GPP TS) 4.2.2	Compliance to given standard	
4.2.3.	Transmitter Spectrum emissions mask	3GPP TS 34.121-1 5.9 EN 301 908-2 (UM3GPP TS) 4.2.3	Compliance to given standard	
4.2.4.	Transmitter spurious emissions in active mode (Conducted)	3GPP TS 34.121-1 5.11 EN 301 908-2 (UM3GPP TS) 4.2.4	Compliance to given standard	
4.2.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 34.121-1 6.8 EN 301 908-2 (UM3GPP TS) 4.2.10	Compliance to given standard	
4.2.6.	Frequency Stability	3GPP TS 34.121-1 5.3 EN 301 908-2 (UM3GPP TS)	Compliance to given standard	
4.2.7.	Transmitter minimum output Power	3GPP TS 34.121-1 5.4.3 EN 301 908-2 (UM3GPP TS) 4.2.5	Compliance to given standard	
4.2.8.	Receiver Reference sensitivity level	3GPP TS 34.121-1 6.2 EN 301 908-2 (UM3GPP TS) 4.2.13	Compliance to given standard	
4.2.9.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 34.121-1 6.4 EN 301 908-2 (UM3GPP TS) 4.2.6	Compliance to given standard	

Clause	Parameter	Standard	Limits/ Results expected	Results
4.2.10.	Receiver In-band blocking	3GPP TS 34.121-1 6.5.2.1 EN 301 908-2 (UM3GPP TS) 4.2.7	Compliance to given standard	

4.3 Technical Requirements of Environmental End Point Devices (EPD) for LTE/LTE-A

Clause	Parameter	Standard	Limits/ Results expected	Results
4.3.1.	<p>Operating Frequency</p> <p>Environmental EPD shall be capable of at least operating in the following frequency bands.</p> <p>LTE(FDD): 824 – 849 MHz (U/L) and 869 – 894 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 to given plan	
4.3.2.	Transmitter Maximum output power	3GPP TS 36.521-1 6.2.2 EN 301 908-13 (LTE) 4.2.2	Compliance to given standard	

Clause	Parameter	Standard	Limits/ Results expected	Results
4.3.3.	Transmitter Spectrum emissions mask	3GPP TS 36.521-1 6.6.2.1 EN 301 908-13 (LTE) 4.2.3	Compliance to given standard	
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 EN 301 908-13 (LTE) 4.2.4	Compliance to given standard	
4.3.5.	Receiver spurious emission in idle mode (Conducted)	3GPP TS 36.521-1 7.9 EN 301 908-13 (LTE) 4.2.10	Compliance to given standard	
4.3.6.	Frequency Stability	3GPP TS 36.521-1 6.5 EN 301 908-13 (LTE)	Compliance to given standard	
4.3.7.	Power Control Absolute power tolerance	3GPP TS 36.521-1 6.3.5.1 EN 301 908-13 (LTE)	Compliance to given standard	
4.3.8.	Receiver Reference sensitivity level	3GPP TS 36.521-1 7.3 EN 301 908-13 (LTE) 4.2.12	Compliance to given standard	
4.3.9.	Receiver Adjacent Channel Selectivity (ACS)	3GPP TS 36.521-1 7.5 EN 301 908-13 (LTE) 4.2.6	Compliance to given standard	
4.3.10.	Receiver In-band blocking	3GPP TS 36.521-1 7.6.1 EN 301 908-13 (LTE) 4.2.7	Compliance to given standard	

4.4 Technical Requirements of Environmental End Point Devices (EPD) for CDMA 2000

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

5 Other Requirements

Clause	Parameter	Standard	Limits/ Results expected	Results
5.	Identification of Equipment for Environmental EPD			
a)	The Environmental EPD 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.	Department of Telecommunication No. 20-40/2006-BS-III(Pt.)(Vol.I) 201 Dated 3 rd Sepember 2009 and GSMA Official Document. Test Procedure: 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	Compliance to given standard	
b)	The Environmental EPD shall not be with all zeroes to identify device	Department of Telecommunication No. 20-40/2006-BS-III(Pt.)(Vol.I)201 dated 3 rd September 2009	Compliance to given standard	
5.	IPv6 Compliance All data (Packet) enabled Environmental EPD shall be capable of carrying IPv6 traffic either on dual stack (IPv4v6) or on native IPv6 compliant	As per latest DoT order	Compliance to given standard	

6 Technical Requirement of Environmental End Point Devices (EPD) for different types of SIM*:

Types of SIM	SIM	USIM	ISIM based UICC	CSIM	RUIM	eSIM	eUICC
Environmental End Point Devices (EPD)	As per ER on SIM	As per ER on USIM	As per ER on ISIM based UICC	As per ER on CSIM	As per ER on RUIM	As per ER on eSIM	As per ER on eUICC

- As per ER issued by MT division