

Essential Requirements (ER)

For

Cordless Telephone

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1. Scope:

This document lays down the Essential Requirements (ER) under the Mandatory Testing Framework in accordance with Government of India Gazette Notification No. G.S.R. 1131 (E), dated 5th September 2017, for “Cordless Telephone” used in Indian Telecom Networks.

1.1 Variants:

Table I: List of products and product variants	
Variants→ Products↓	Variant 1
Cord Less Telephone	Cordless Telephone

1.2 Brief Description

This Document covers the basic aspects of the Essential Requirements, namely-EMI/EMC Requirements, Safety Requirements, Security Requirements, Technical Requirements and Other Requirements (if any).

2. Essential Requirements

Essential Requirements, namely-EMI/EMC Requirements, Safety Requirements, Security Requirements, Technical Requirements and Other Requirements (if any) are as follows:

2.1 EMI/EMC Requirement:

The equipment shall conform to the EMC requirements as per the TEC Standard No. TEC/SD/DD/EMC-221/05.OCT 2016 and limits indicated therein.

S.N.	Parameter	Results
i)	<p>Conducted and radiated emission: Name of EMC Standard: "CISPR 22 (2008)/CISPR 32 - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment". Limits:- i. To comply with Class B of CISPR 22 (2008)/CISPR 32. ii. The values of limits shall be as per TEC Standard No. TEC/SD/DD/EMC-221/05.OCT 2016. iii. For Radiated Emission tests, limits below 1 GHz shall be as per Table 4 (a1) or 5 (a1) of TEC Standard No. TEC/SD/DD/EMC-221/05.OCT 2016 for measuring distance of 3m.</p>	<p>Test results from Designated CAB of TEC to be submitted for compliance.</p>
ii)	<p>Immunity to Electrostatic discharge: Name of EMC Standard: IEC 61000-4-2 {2008} "Testing and measurement techniques of Electrostatic discharge immunity test". Limits: - i. Contact discharge level 2 {± 4 kV} or higher voltage; ii. Air discharge level 3 {± 8 kV} or higher voltage;</p>	<p>Test results from Designated CAB of TEC to be submitted for compliance</p>
iii)	<p>Immunity to radiated RF: Name of EMC Standard: IEC 61000-4-3 (2010) "Testing and measurement techniques- Radiated RF Electromagnetic Field Immunity test" Limits:-</p>	<p>Test results from Designated CAB of TEC to be</p>

	<p>For Telecom Equipment and Telecom Terminal Equipment with Voice interface (s):</p> <p>i. Under Test level 2 {Test field strength of 3 V/m} for general purposes in frequency range 80 MHz to 1000 MHz and</p> <p>ii. Under test level 3 (10 V/m) 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.</p>	submitted for compliance
iv)	<p>Immunity to fast transients (burst):</p> <p>Name of EMC Standard: IEC 61000- 4- 4 {2012) "Testing and measurement techniques of electrical fast transients/burst immunity test"</p> <p>Limits:-</p> <p>Test Level 2 i.e. a) 1 kV for AC/DC power lines; b) 0. 5 kV for signal / control / data / telecom lines;</p>	Test results from Designated CAB of TEC to be submitted for compliance
v)	<p>Immunity to surges:</p> <p>Name of EMC Standard: IEC 61000-4-5 (2014) "Testing & Measurement techniques for Surge immunity test"</p> <p>Limits:-</p> <p>i. For mains power input ports:</p> <p>(a) 2 kV peak open circuit voltage for line to ground coupling</p> <p>(b) 1 kV peak open circuit voltage for line to line coupling</p> <p>ii. For telecom ports:</p> <p>(a) 2 kV peak open circuit voltage for line to ground</p> <p>(b) 2 kV peak open circuit voltage for line to line coupling.</p>	Test results from Designated CAB of TEC to be submitted for compliance
vi)	<p>Immunity to conducted disturbance induced by Radio frequency fields:</p>	Test results from Designated CAB of

	<p>Name of EMC Standard: IEC 61000-4-6 (2013) "Testing & measurement techniques- Immunity to conducted disturbances induced by radio- frequency fields"</p> <p>Limits:- 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>	TEC to be submitted for compliance
vii)	<p>Immunity to voltage dips & short interruptions (applicable to only ac mains power input ports, if any):</p> <p>Name of EMC Standard: IEC 61000-4-11 (2004) "Testing & measurement techniques- voltage dips, short interruptions and voltage variations immunity tests"</p> <p>Limits:-</p> <ul style="list-style-type: none"> i. a voltage dip corresponding to a reduction of the supply voltage of 30% for 500ms (i.e. 70 % supply voltage for 500ms) ii. a voltage dip corresponding to a reduction of the supply voltage of 60% for 200ms; (i.e. 40% supply voltage for 200ms) iii. a voltage interruption corresponding to a reduction of supply voltage of > 95% for 5s. iv. a voltage interruption corresponding to a reduction of supply voltage of >95% for 10ms. 	Test results from Designated CAB of TEC to be submitted for compliance
viii)	<p>Immunity to voltage dips & short interruptions (applicable to only DC power input ports, if any):</p> <p>Name of EMC Standard: IEC 61000-4-29:2000: Electromagnetic compatibility (EMC) Part 4-29: Testing and measurement techniques- voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests</p>	Test results from Designated CAB of TEC to be submitted for compliance

	<p>Limits:</p> <ul style="list-style-type: none"> i. Voltage Interruption with 0% of supply for 10ms. Applicable Performance Criteria shall be B. ii. Voltage Interruption with 0% of supply for 30ms, 100ms, 300ms and 1000ms. Applicable Performance Criteria shall be C. iii. Voltage dip corresponding to 40% & 70% of supply for 10ms, 30 ms. Applicable Performance Criteria shall be B. iv. Voltage dip corresponding to 40% & 70% of supply for 100ms, 300 ms and 1000 ms. Applicable Performance Criteria shall be C. v. Voltage variations corresponding to 80% and 120% of supply for 100 ms to 10s as per Table 1c of IEC 61000-4-29. Applicable Performance Criteria shall be B. 	
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Note: For checking compliance with the above EMC requirements, the method of measurements shall be in accordance with TEC Standard No. TEC/SD/RD/EMC-002/02.OCT.2016 and the references mentioned therein.

2.2 Safety Requirements:

S.N.	Parameter	Results/Remarks
i)	The device shall conform to IS 13252 (2003) "Safety of information technology device including electrical business device" {equivalent to IEC Publication 60950 (2001)} and IS 10437 {1986} "Safety requirements of radio transmitting devices" equivalent to IEC 60215{for Radio Devices only}.	Compliance
iv)	Safety Requirements for Batteries:	Compliance

IS 16046: 2012 (equivalent to IEC 62133: 2002) (latest version, if any)	
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2.3 Security Requirements:

As and when prescribed by DoT HQ

2.4 Technical Requirements:

For technical requirements, refer Table-II for interfaces used for product variants, Table-III A for Interface parameters and Table III B for other test parameters for product variants.

Table II: List of Interfaces for products and their variants	
Applicable to→ Interface ↓	Cord-Less Telephone
2 Wire/PSTN	y

Table III-A: List of Interface parameters and their international standards		
Applicable to→ Test Parameter ↓	(Standards)	2W/ PSTN
Longitudinal/ Transverse Conversion Loss/ (Impedance Unbalance about earth)	Q.552 (clause 2.1.2)	y
Return Loss	Q.552(clause 2.1.1.2)	y

Over Voltage/ Over Current Protection	K.21	y
Max. Loop Current	ETSI EN 300 001(<60 mA)	y
Idle State Current	ETSI EN 300 001 (<30 μ A)	y
Insulation Test	ETSI EN 300 001(>5 M Ω)	y

Table III-B: List of additional test parameters applicable to products		
Applicable to→ Test Parameter ↓	<i>(Standards)</i>	Cordless Telephone
Acoustic Shock Absorption	P.360	y
Frequency Band of operation	Refer Annexure-I	y
EIRP	Refer Annexure-I	y
Transmit Power	Refer Annexure-I	y
Spurious Emission	Refer Annexure-II	y

2.5 Other Requirements (if any):

Annexure-I

The Frequency, Power and Range of the Base and Remote Station:

The following frequency, power and range have been specified by the Wireless Planning Cell of the Ministry of Communications for the use of Cordless Telephones in India.

A. Base Units Only

Frequencies	Power	Remarks
1610 }	500 mW	Maximum range

1640 } KHz		100 meters
1675 }		
1690 }		

B. Base Units/Remote Units

26.375 }		
26.475 }		
26.575 }		
26.625 }		
46.675 }MHz	500 mW/For base	On non-
46.725 }	Stations	interference and
46.775 }	200 mW for Remote	non-protection
46.825 }	Station.	basis.
46.830 }		
49.845 }		
49.860 }		
49.875 }		

C. Remote Units Only

150.350 }		On non-
150.750 } MHz	50 mW	interference and
150.850 }		non-protection
150.950 }		basis.

D

Channel No.	Base Station Transmit (MHz)	Handset Transmit (MHz.)
1	46.610	49.670
2	46.630	49.845
3	46.670	49.860
4	46.710	49.770
5	46.730	49.875
6	46.770	49.830
7	46.830	49.890
8	46.870	49.930
9	46.930	49.990

10	46.970	49.970
11	43.720	48.760
12	43.740	48.840
13	43.820	48.860
14	43.840	48.920
15	43.920	49.020
16	43.960	49.080
17	44.120	49.100
18	44.160	49.160
19	44.180	49.200
20	44.200	49.240
21	44.320	49.280
22	44.360	49.360
23	44.400	49.400
24	44.460	49.460
25	44.480	49.500
RF Power	500 mW	100 mW

E As per IND52 of National Frequency Allocation Table (NFAP – 2011, Wireless Planning & Coordination Wing of Department of Telecommunications) certain frequency spots in the frequency band 926 – 926.5 MHz may be considered for very low power cordless telephone systems. The use of this band for such purpose is on the basis of non-interference, non-protection and non-exclusiveness.

F In case of the cordless telephone operating in the frequency band 2.4 GHz to 2.4835 GHz, it shall have an effective radiated power of up to or equal to -10dbW (100mW) and a power spectral density of up to -10 dbW/100 KHz (100 mW) eirp for frequency hopping spread spectrum modulation or a power spectral density of up to -20 dbW/1 MHz (10mW) eirp for other forms of modulation.

G The Cordless Phone shall work in the following band as per IND 67 of NFAP 2011. - Use of low power equipments for wireless access systems in the frequency band 5.150-5.350 GHz and 5.725 – 5.875 GHz using a maximum mean Effective Isotropic Radiated Power of 200 mW and a maximum mean Effective Isotropic Radiated Power density of 10mW/MHz in any 1 MHz bandwidth, for the indoor applications (exempted from licensing requirement. As per GSR No 46E dated 28.1.2005)

Maximum frequency deviation shall be within + 5.0 KHz.

Maximum range shall be 100 meters.

Annexure-II

1. Transmitter spurious emissions:

Limit:

The spurious emissions of the transmitter shall not exceed the values in table 2 and 3 in the indicated bands.

Table 2: Transmitter limits for narrowband spurious emission

Frequency range	Limit when operating	Limit when in standby
30 MHz to 1 GHz	- 36 dBm	- 57 dBm
Above 1 GHz to 12.75 GHz	- 30 dBm	- 47 dBm

1.8 GHz to 1.9 GHz	- 47 dBm	- 47 dBm
5.15 GHz to 5.3 GHz		

The above limit values apply to narrowband emissions, e.g. as caused by local oscillator leakage. The measurement bandwidth for such emissions may be as small as necessary to achieve a reliable measurement result.

Wideband emissions shall not exceed the values given in table 3

Table 3: Transmitter limits for wideband spurious emission

Frequency range	Limit when operating	Limit when in standby
30 MHz to 1 GHz	- 86 dBm/Hz	- 107 dBm/Hz
Above 1 GHz to 12.75 GHz	- 80 dBm/Hz	- 97 dBm/Hz
1.8 GHz to 1.9 GHz 5.15 GHz to 5.3 GHz	- 97 dBm/Hz	- 97 dBm/Hz

2. Receiver spurious emissions:

Limits:

The spurious emissions of the receiver shall not exceed the values in tables 4 and 5 in the indicated bands.

Table 4: Narrowband spurious emission limits for receivers

Frequency range	Limit
30 MHz to 1 GHz	- 57 dBm
Above 1 GHz to 12.75 GHz	- 47 dBm .

The limit values of table 4 apply to narrowband emissions, e.g. as caused by local oscillator leakage. The measurement bandwidth for such emissions may be as small as necessary to get a reliable measurement result.

Wideband emissions shall not exceed the values given in table 5.

Table 5: Wideband spurious emission limits for receivers

Frequency range	Limit
30 MHz to 1 GHz	- 107 dBm/ Hz
Above 1 GHz to 12.75 GHz	- 97 dBm / Hz