

अनिवार्य आवश्यकताएँ

संख्या : TEC58432606

Essential Requirements

ER No. : TEC58432606

VHF UHF Radio System Equipment

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Telecommunication Engineering Centre

Government of India

Khurshid Lal Bhawan, Janpath, New Delhi-110001, INDIA

Essential Requirements for:

VHF UHF Radio System Equipment

Certification Scheme: **GCS**

Product Fee Group: **C**

This ER covers VHF and UHF Radio Base Station and User Terminals and Repeater

Note: Annexures referred to in this ER are Annexures as mentioned in "Annexures to ERs" No. TEC/SD/DD/TCP-222/02/June19 as updated from time to time and available on MTCTE portal.

This product has the following variants:

1. VHF UHF Baseband Equipment without Radio
2. VHF UHF Base Station - Baseband plus Radio
3. VHF UHF Base Station - Radio Only
4. VHF UHF Fixed Station
5. VHF UHF Handheld Portable Stations

6. VHF UHF Mobile Stations

7. VHF UHF Repeater

1. Variant 1 : VHF UHF Baseband Equipment without Radio

1.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
1.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
1.1.2	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
1.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
1.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
1.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
1.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
1.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
1.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
1.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B

1.2 Interface 1 : 100 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.2.1	Average Launch power for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
1.2.2	Receiver Sensitivity 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
1.2.3	Wavelength for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H

1.3 Interface 2 : 10 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.3.1	Average Launch power for 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H
1.3.2	Receiver Sensitivity 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H
1.3.3	Wavelength for 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H

1.4 Interface 3 : 1 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.4.1	Average Launch power for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
1.4.2	Receiver Sensitivity 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
1.4.3	Wavelength for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H

1.5 Interface 4 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
1.5.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.5.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
1.5.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
1.5.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.5.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

1.6 Interface 5 : 40 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.6.1	Average Launch power for 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H
1.6.2	Receiver Sensitivity 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H
1.6.3	Wavelength for 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H

1.7 Interface 6 : Bluetooth Low Energy

S.No.	Parameter Name	Standard Name
1.7.1	EIRP for BLE Interface	WPC GSR 45(E). Annex-G4 (4.2)
1.7.2	Frequency of Operation for BLE Interface	Latest NFAP. Annex-G4(4.1)
1.7.3	Spurious Emission for BLE Interface	Annex G3

1.8 Interface 7 : Fast Ethernet Electrical

S.No.	Parameter Name	Standard Name
1.8.1	Link Speed and Autonegotiation Test FE	IEEE 802.3 Annex-H

1.9 Interface 8 : Gigabit Ethernet Electrical

S.No.	Parameter Name	Standard Name
1.9.1	Link Speed and Autonegotiation Test GE	IEEE 802.3. Annex-H

1.10 Interface 9 : Near Field Communication

S.No.	Parameter Name	Standard Name
1.10.1	Frequency of Operation for NFC Int	Latest NFAP. Annex-G6(6.1)
1.10.2	Spurious Emission for NFC Int	Annex- G3

1.11 Interface 10 : STM-16 Optical

S.No.	Parameter Name	Standard Name
1.11.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
1.11.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
1.11.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
1.11.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
1.11.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
1.11.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
1.11.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

1.12 Interface 11 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
1.12.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
1.12.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
1.12.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
1.12.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K

1.12.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K
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1.13 Interface 12 : STM-1 Optical

S.No.	Parameter Name	Standard Name
1.13.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
1.13.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
1.13.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
1.13.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
1.13.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
1.13.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
1.13.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

1.14 Interface 13 : STM-4 Optical

S.No.	Parameter Name	Standard Name
1.14.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
1.14.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
1.14.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
1.14.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
1.14.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
1.14.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
1.14.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

1.15 Interface 14 : STM-64 Optical

S.No.	Parameter Name	Standard Name
1.15.1	Input Jitter Tolerance for STM-64 Opt	ITU-T G.825. Annex-K
1.15.2	Mean Launched Power for STM-64 Opt Int	ITU-T G.691. Annex-K
1.15.3	Nominal Bit Rate with Tolerance STM-64 Opt Int	ITU-T G.707 Annex-K
1.15.4	Operating Wavelength Range for STM-64	ITU-T G.691. Annex-K

	Opt Int	
1.15.5	Output Jitter for STM-64 Opt Int	ITU-T G.783. Annex-K
1.15.6	Receiver Overload for STM-64 Opt Int	ITU-T G.691. Annex-K
1.15.7	Receiver Sensitivity for STM-64 Opt Int	ITU-T G.691. Annex-K

1.16 Interface 15 : WiFi

S.No.	Parameter Name	Standard Name
1.16.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
1.16.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3
1.16.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
1.16.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1

2. Variant 2 : VHF UHF Base Station - Baseband plus Radio

2.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
2.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
2.1.2	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN550 32. Annex-B
2.1.3	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
2.1.4	Frequency for VHF or UHF equipment	NFAP. Annex-C1
2.1.5	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
2.1.6	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
2.1.7	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B

2.1.8	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
2.1.9	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
2.1.10	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
2.1.11	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
2.1.12	Max Transmit Power for VHF or UHF Base Stn	As per DoT/WPC license conditions. Annex-C2

2.2 Interface 1 : 100 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.2.1	Average Launch power for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
2.2.2	Receiver Sensitivity 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
2.2.3	Wavelength for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H

2.3 Interface 2 : 10 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.3.1	Average Launch power for 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H
2.3.2	Receiver Sensitivity 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H
2.3.3	Wavelength for 10 GE Opt	IEEE 802.3ae Cl. 52. Annex-H

2.4 Interface 3 : 1 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.4.1	Average Launch power for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.4.2	Receiver Sensitivity 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.4.3	Wavelength for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H

2.5 Interface 4 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
2.5.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.5.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I

2.5.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
2.5.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.5.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

2.6 Interface 5 : 40 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.6.1	Average Launch power for 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H
2.6.2	Receiver Sensitivity 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H
2.6.3	Wavelength for 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H

2.7 Interface 6 : Bluetooth Low Energy

S.No.	Parameter Name	Standard Name
2.7.1	EIRP for BLE Interface	WPC GSR 45(E). Annex-G4 (4.2)
2.7.2	Frequency of Operation for BLE Interface	Latest NFAP. Annex-G4(4.1)
2.7.3	Spurious Emission for BLE Interface	Annex G3

2.8 Interface 7 : Fast Ethernet Electrical

S.No.	Parameter Name	Standard Name
2.8.1	Link Speed and Autonegotiation Test FE	IEEE 802.3 Annex-H

2.9 Interface 8 : Gigabit Ethernet Electrical

S.No.	Parameter Name	Standard Name
2.9.1	Link Speed and Autonegotiation Test GE	IEEE 802.3. Annex-H

2.10 Interface 9 : Near Field Communication

S.No.	Parameter Name	Standard Name
2.10.1	Frequency of Operation for NFC Int	Latest NFAP. Annex-G6(6.1)
2.10.2	Spurious Emission for NFC Int	Annex- G3

2.11 Interface 10 : STM-16 Optical

S.No.	Parameter Name	Standard Name
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2.11.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
2.11.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
2.11.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
2.11.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
2.11.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
2.11.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
2.11.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

2.12 Interface 11 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
2.12.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
2.12.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
2.12.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
2.12.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K
2.12.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K

2.13 Interface 12 : STM-1 Optical

S.No.	Parameter Name	Standard Name
2.13.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
2.13.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
2.13.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
2.13.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
2.13.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
2.13.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
2.13.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

2.14 Interface 13 : STM-4 Optical

S.No.	Parameter Name	Standard Name
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2.14.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
2.14.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
2.14.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
2.14.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
2.14.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
2.14.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
2.14.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

2.15 Interface 14 : STM-64 Optical

S.No.	Parameter Name	Standard Name
2.15.1	Input Jitter Tolerance for STM-64 Opt	ITU-T G.825. Annex-K
2.15.2	Mean Launched Power for STM-64 Opt Int	ITU-T G.691. Annex-K
2.15.3	Nominal Bit Rate with Tolerance STM-64 Opt Int	ITU-T G.707 Annex-K
2.15.4	Operating Wavelength Range for STM-64 Opt Int	ITU-T G.691. Annex-K
2.15.5	Output Jitter for STM-64 Opt Int	ITU-T G.783. Annex-K
2.15.6	Receiver Overload for STM-64 Opt Int	ITU-T G.691. Annex-K
2.15.7	Receiver Sensitivity for STM-64 Opt Int	ITU-T G.691. Annex-K

2.16 Interface 15 : WiFi

S.No.	Parameter Name	Standard Name
2.16.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
2.16.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3
2.16.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
2.16.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1

3. Variant 3 : VHF UHF Base Station - Radio Only

3.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
3.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
3.1.2	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
3.1.3	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
3.1.4	Frequency for VHF or UHF equipment	NFAP. Annex-C1
3.1.5	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
3.1.6	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
3.1.7	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
3.1.8	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
3.1.9	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
3.1.10	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
3.1.11	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
3.1.12	Max Transmit Power for VHF or UHF Base Stn	As per DoT/WPC license conditions. Annex-C2

4. Variant 4 : VHF UHF Fixed Station

4.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
4.1.1	Audio/ Video, Information and	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-

	Communication Technology Equipment Safety	1 Annex-A1
4.1.2	Conducted And Radiated Emission - Class B	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
4.1.3	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
4.1.4	Frequency for VHF or UHF equipment	NFAP. Annex-C1
4.1.5	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
4.1.6	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
4.1.7	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
4.1.8	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
4.1.9	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
4.1.10	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
4.1.11	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
4.1.12	Max Transmit Power for UHF or VHF Fixed Stn	As per DoT/WPC license conditions. Annex-C2

4.2 Interface 1 : Bluetooth Low Energy

S.No.	Parameter Name	Standard Name
4.2.1	EIRP for BLE Interface	WPC GSR 45(E). Annex-G4 (4.2)
4.2.2	Frequency of Operation for BLE Interface	Latest NFAP. Annex-G4(4.1)
4.2.3	Spurious Emission for BLE Interface	Annex G3

4.3 Interface 2 : Near Field Communication

S.No.	Parameter Name	Standard Name
4.3.1	Frequency of Operation for NFC Int	Latest NFAP. Annex-G6(6.1)
4.3.2	Spurious Emission for NFC Int	Annex- G3

4.4 Interface 3 : WiFi

S.No.	Parameter Name	Standard Name
4.4.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
4.4.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3
4.4.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
4.4.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1

5. Variant 5 : VHF UHF Handheld Portable Stations

5.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
5.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
5.1.2	Battery Safety	IS 16046. EN/IEC 62133. Annex-A2
5.1.3	Conducted And Radiated Emission - Class B	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
5.1.4	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
5.1.5	Frequency for VHF or UHF equipment	NFAP. Annex-C1
5.1.6	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
5.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
5.1.8	Max Transmit Power for VHF or UHF HH Stn	As per DoT/WPC license conditions. Annex-C2

5.2 Interface 1 : Bluetooth Low Energy

S.No.	Parameter Name	Standard Name
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5.2.1	EIRP for BLE Interface	WPC GSR 45(E). Annex-G4 (4.2)
5.2.2	Frequency of Operation for BLE Interface	Latest NFAP. Annex-G4(4.1)
5.2.3	Spurious Emission for BLE Interface	Annex G3

5.3 Interface 2 : Near Field Communication

S.No.	Parameter Name	Standard Name
5.3.1	Frequency of Operation for NFC Int	Latest NFAP. Annex-G6(6.1)
5.3.2	Spurious Emission for NFC Int	Annex- G3

5.4 Interface 3 : WiFi

S.No.	Parameter Name	Standard Name
5.4.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
5.4.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3
5.4.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
5.4.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1

6. Variant 6 : VHF UHF Mobile Stations

6.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
6.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
6.1.2	Battery Safety	IS 16046. EN/IEC 62133. Annex-A2
6.1.3	Conducted And Radiated Emission - Class B	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
6.1.4	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
6.1.5	Frequency for VHF or UHF equipment	NFAP. Annex-C1

6.1.6	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
6.1.7	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
6.1.8	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
6.1.9	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
6.1.10	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
6.1.11	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
6.1.12	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
6.1.13	Max Transmit Power for VHF or UHF Mob Stn	As per DoT/WPC license conditions. Annex-C2

6.2 Interface 1 : Bluetooth Low Energy

S.No.	Parameter Name	Standard Name
6.2.1	EIRP for BLE Interface	WPC GSR 45(E). Annex-G4 (4.2)
6.2.2	Frequency of Operation for BLE Interface	Latest NFAP. Annex-G4(4.1)
6.2.3	Spurious Emission for BLE Interface	Annex G3

6.3 Interface 2 : Near Field Communication

S.No.	Parameter Name	Standard Name
6.3.1	Frequency of Operation for NFC Int	Latest NFAP. Annex-G6(6.1)
6.3.2	Spurious Emission for NFC Int	Annex- G3

6.4 Interface 3 : WiFi

S.No.	Parameter Name	Standard Name
6.4.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
6.4.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt

		15.249. Annex-G3
6.4.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
6.4.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1

7. Variant 7 : VHF UHF Repeater

7.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
7.1.1	Audio/ Video, Information and Communication Technology Equipment Safety	IS 13252-1 or IEC 62368-1 or IS/IEC 62368-1 Annex-A1
7.1.2	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN55032. Annex-B
7.1.3	Conformance to standards for VHF or UHF Radio Systems	ETSI EN 300xxx,301xxx / FCC CFR 47 Part 90 / ANSI/TIA-102.CAAA-E, Annex-C3
7.1.4	Frequency for VHF or UHF equipment	NFAP. Annex-C1
7.1.5	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
7.1.6	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
7.1.7	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
7.1.8	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
7.1.9	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
7.1.10	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
7.1.11	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
7.1.12	Max Transmit Power for VHF or UHF Repeater	As per DoT/WPC license conditions. Annex-C2