अनिवार्य आवश्यकताएं

संख्या: TEC5943xxxx

Essential Requirements
ER No. : TEC5943xxxx

Equipment Operating in 2.4 GHz, 5 GHz and 6 GHz Bands

MTCTE के तहत जारी:

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दूरसंचार अभियांत्रिकी केंद्र

भारत सरकार

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Government of India
Khurshid Lal Bhawan, Janpath, New Delhi-110001, INDIA

Essential Requirements for:

Equipment's Operating in 2.4 GHz, 5 GHz and 6 GHz Bands

Certification Scheme: **SCS** Product Fee Group: **B**

This ER covers all types of Wi-Fi Access Point, Wi-Fi Controller, Wi-Fi Base Station and Point to Point Systems in 2.4 GHz, 5 GHz and 6 GHz frequency bands

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. PTP PMP Wireless Access Equipment 2.4, 5 or 6 GHz
2. Wi-Fi Access Points and CPE
3. WLAN Controller Equipment

1. Variant 1 : PTP PMP Wireless Access Equipment 2.4, 5 or 6 GHz

1.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
1.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN550 32. Annex-B
1.1.2	EIRP for PTP PMP Radio Interface	Latest NFAP and GSRs issued by DoT WPC . Annex-G2
1.1.3	Frequency for PTP PMP Radio Interface	DoT WPC GSR No. 45(E) 1048(E). Annex- G1.
1.1.4	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
1.1.5	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B

1.1.6	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
1.1.7	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
1.1.8	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
1.1.9	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
1.1.10	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
1.1.11	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
1.1.12	PTP PMP Radio Interface Conformance	Annex-G3

1.2 Interface 1 : 10 G Optical Ethernet

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

1.3 Interface 2 : 1 G Optical Ethernet

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

1.4 Interface 3 : Fast Ethernet Electrical

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

1.5 Interface 4: Gigabit Ethernet Electrical: 10/100/1000 BASE-T Electrical

S.No.	Parameter Name	Standard Name

1.5.1	Link Speed and Autonegotiation Test GE	IEEE 802.3. Annex-H

1.6 Interface 5: 2.5G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.6.1	Link Speed and Auto negotiation Test 2.5GE	IEEE 802.3bz. Annex-H

1.7 Interface 6: 5G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.7.1	Link Speed and Auto negotiation Test 5GE	IEEE 802.3bz. Annex-H

1.8 Interface 7: 10G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.8.1	Link Speed and Auto negotiation Test 10GE	IEEE 802.3an. Annex-H

1.9 Interface 8: Bluetooth Low Energy/Bluetooth

S.No.	Parameter Name	Standard Name
1.9.1	Basic RF Requirements for BLE Interface	Annex G4 (4.4 to 4.15), ETSI EN 300 328 V2.2.2
1.9.2	EIRP for BLE Interface	WPC GSR 45(E), Annex G4 (4.2)
1.9.3	Frequency of Operation for BLE Interface	Latest NFAP, Annex G4 (4.1)
1.9.4	Maximum Transmitted Power for BLE Interface	WPC GSR 45(E), Annex G4 (4.3)

1.10 Interface 9: Geolocation Navigation Interface

S. No.	Parameter Name	Standard Name
1.10.1	GPS for IoT	Annexure to ER for Tracking Device
1.10.2	NavIC for IoT	Annexure to ER for Tracking Device

1.11 Interface 10: LPWAN – LoRa

S. No.	Parameter Name	Standard Name
1.11.1	Basic RF Requirements for LPWAN-LoRa	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
1.11.2	EIRP LoRa	WPC GSR 564(E), Annex G5 (5.2)
1.11.3	Frequency of Operation for LoRa Int	Latest NFAP, Annex G5 (5.1)
1.11.4	Maximum Transmit Power LoRa	WPC GSR 564(E), Annex G5 (5.3)

1.12 Interface 11: LPWAN – Sigfox

S. No.	Parameter Name	Standard Name

1.12.1	Basic RF Requirements for LPWAN - SigFox	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
1.12.2	EIRP SigFox	WPC GSR 564(E), Annex G5 (5.2)
1.12.3	Frequency of Operation for SigFox Int	Latest NFAP, Annex G5 (5.1)
1.12.4	Maximum Transmit Power SigFox	WPC GSR 564(E), Annex G5 (5.3)

1.13 Interface 12: NFC

S. No.	Parameter Name	Standard Name
1.13.1	Basic RF Requirements for NFC Int	Annex G6 (6.2 to 6.13), ETSI EN 300 330 V2.1.1
1.13.2	Frequency of Operation for NFC Int	Latest NFAP, Annex G6 (6.1)

1.14 Interface 13: ZigBee

S. No.	Parameter Name	Standard Name
1.14.1	Basic RF Requirements for ZigBee Interface	Annex G4 (4.4 to 4.15), ETSI EN 300 328 V2.2.2
1.14.2	EIRP for ZigBee Interface	WPC GSR 45(E), Annex G4 (4.2)
1.14.3	Frequency of Operation for ZigBee Interface	Latest NFAP, Annex G4 (4.1)
1.14.4	Maximum Transmitted Power for ZigBee Int	WPC GSR 45(E), Annex G4 (4.3)

1.15 Interface 14 : Wi Fi

S.No.	Parameter Name	Standard Name
1.15.1	2.4 GHz Wi-Fi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
1.15.2	5 GHz Wi-Fi 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
1.15.3	6 GHz Wi-Fi Radio Conformance	ETSI EN 303 687 or FCC CFR 47 Part 15.407 Annex-G3
1.15.4	EIRP for Wi-Fi Interface	Latest NFAP and GSRs issued by DoT WPC as Very Low power Outdoor Limit. Annex-G2
1.15.5	Frequency for Wi-Fi equipments	DoT WPC GSR No. 45(E) ,1048(E),47(E). Annex- G1

2. Variant 2 : Wi-Fi Access Points and CPE

2.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
2.1.1	Conducted And Radiated Emission - Class A or Class B	TEC EMI EMC Standard CISPR 32 EN55032. Class A or Class B applicability as defined in Notes to Annex-B.
2.1.2	Dual IP Layer Operation RFC 4213 - Address	RFC 4213 Cl. 2.1. Annex-P6
2.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
2.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
2.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
2.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
2.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
2.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
2.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
2.1.10	IPV6 Extn Header Parameters	RFC 2460 or RFC 8200 . Annex-P7
2.1.11	IPV6 Header Parameters	RFC 2460 / RFC 8200. Annex-P7
2.1.12	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A

2.2 Interface 1 : Fast Ethernet Electrical

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

2.3 Interface 2 : Gigabit Ethernet Electrical: 10/100/1000 BASE-T Electrical

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

2.4 Interface 3: 2.5G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
2.4.1	Link Speed and Auto negotiation Test 2.5GE	IEEE 802.3bz. Annex-H

2.5 Interface 4: 5G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
2.5.1	Link Speed and Auto negotiation Test 5GE	IEEE 802.3bz. Annex-H

2.6 Interface 5: 10G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
2.6.1	Link Speed and Auto negotiation Test 10GE	IEEE 802.3an. Annex-H

2.7 Interface 6 : 10 G Optical Ethernet

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

2.8 Interface 7 : 1 G Optical Ethernet

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

2.9 Interface 8: Bluetooth Low Energy/Bluetooth

S. No.	Parameter Name	Standard Name
2.9.1	Basic RF Requirements for BLE Interface	Annex G4 (4.4 to 4.15), ETSI EN 300 328 V2.2.2
2.9.2	EIRP for BLE Interface	WPC GSR 45(E), Annex G4 (4.2)
2.9.3	Frequency of Operation for BLE Interface	Latest NFAP, Annex G4 (4.1)
2.9.4	Maximum Transmitted Power for BLE Interface	WPC GSR 45(E), Annex G4 (4.3)

2.10 Interface 9: Geolocation Navigation Interface

S. No.	Parameter Name	Standard Name
2.10.1	GPS for IoT	Annexure to ER for Tracking Device
2.10.2	NavIC for IoT	Annexure to ER for Tracking Device

2.11 Interface 10: LPWAN – LoRa

S. No.	Parameter Name	Standard Name
2.11.1	Basic RF Requirements for LPWAN-LoRa	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
2.11.2	EIRP LoRa	WPC GSR 564(E), Annex G5 (5.2)
2.11.3	Frequency of Operation for LoRa Int	Latest NFAP, Annex G5 (5.1)
2.11.4	Maximum Transmit Power LoRa	WPC GSR 564(E), Annex G5 (5.3)

2.12 Interface 11: LPWAN – Sigfox

S. No.	Parameter Name	Standard Name
2.12.1	Basic RF Requirements for LPWAN - SigFox	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
2.12.2	EIRP SigFox	WPC GSR 564(E), Annex G5 (5.2)
2.12.3	Frequency of Operation for SigFox Int	Latest NFAP, Annex G5 (5.1)
2.12.4	Maximum Transmit Power SigFox	WPC GSR 564(E), Annex G5 (5.3)

2.13 Interface 12: NFC

S. No.	Parameter Name	Standard Name
2.13.1	Basic RF Requirements for NFC Int	Annex G6 (6.2 to 6.13), ETSI EN 300 330 V2.1.1
2.13.2	Frequency of Operation for NFC Int	Latest NFAP, Annex G6 (6.1)

2.14 Interface 13: ZigBee

S. No.	Parameter Name	Standard Name
2.14.1	Basic RF Requirements for ZigBee Interface	Annex G4 (4.4 to 4.15), ETSI EN 300 328 V2.2.2
2.14.2	EIRP for ZigBee Interface	WPC GSR 45(E), Annex G4 (4.2)
2.14.3	Frequency of Operation for ZigBee Interface	Latest NFAP, Annex G4 (4.1)
2.14.4	Maximum Transmitted Power for ZigBee Int	WPC GSR 45(E), Annex G4 (4.3)

2.15 Interface 14 : Wi-Fi

S.No.	Parameter Name	Standard Name
2.15.1	2.4 GHz Wi-Fi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
2.15.2	5 GHz Wi-Fi 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
2.15.3	6 GHz Wi-Fi Radio Conformance	ETSI EN 303 687 or FCC CFR 47 Part 15.407 Annex-G3

2.15.4	EIRP for Wi-Fi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
2.15.5	Frequency for Wi-Fi equipments	DoT WPC GSR No. 45(E) 1048(E)) 47(E).. Annex- G1

3. Variant 3 : WLAN Controller Equipment

3.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
3.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 32 EN550 32. Annex-B
3.1.2	Dual IP Layer Operation RFC 4213 - Address	RFC 4213 Cl. 2.1. Annex-P6
3.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
3.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
3.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
3.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
3.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
3.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
3.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
3.1.10	IPV6 Extn Header Parameters	RFC 2460 or RFC 8200 . Annex-P7
3.1.11	IPV6 Header Parameters	RFC 2460 / RFC 8200 . Annex-P7
3.1.12	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

3.2 Interface 1 : 10 G Optical Ethernet

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

3.3 Interface 2 : 1 G Optical Ethernet

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

3.4 Interface 3 : Fast Ethernet Electrical

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

3.5 Interface 4 : Gigabit Ethernet Electrical: 10/100/1000 BASE-T Electrical

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

3.6 Interface 5: 2.5G BASE-T Ethernet

S.No.	**Parameter Name**	**Standard Name**
3.6.1	Link Speed and Auto negotiation Test 2.5GE	IEEE 802.3bz. Annex-H

3.7 Interface 6: 5G BASE-T Ethernet

S.No.	**Parameter Name**	**Standard Name**
3.7.1	Link Speed and Auto negotiation Test 5GE	IEEE 802.3bz. Annex-H

3.8 Interface 7: 10G BASE-T Ethernet

S.No.	**Parameter Name**	**Standard Name**
3.8.1	Link Speed and Auto negotiation Test 10GE	IEEE 802.3an. Annex-H

3.9 Interface 8: 25 G Optical Ethernet

S. No.	**Parameter Name**	**Standard Name**
3.9.1	Average Launch Power for 25 GE Opt	IEEE 802.3 – 2018 Cl. 114
3.9.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 – 2018 Cl. 114
3.9.3	Wavelength for 25 GE Opt	IEEE 802.3 – 2018 Cl. 114

3.10 Interface 9: 40 G Optical Ethernet

S. No.	**Parameter Name**	**Standard Name**

3.10.1	Average Launch Power for 40 GE Opt	IEEE 802.3ba Cl. 86, 87, Annex-H
3.10.2	Receiver Sensitivity for 40 GE Opt	IEEE 802.3ba Cl. 86, 87, Annex-H
3.10.3	Wavelength for 40 GE Opt	IEEE 802.3ba Cl. 86, 87, Annex-H

3.11 Interface 10: 50G Ethernet Optical

S. No.	Parameter Name	Standard Name
3.11.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
3.11.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
3.11.3	Wavelength for 50 GE Opt	IEEE 802.3cn

3.12 Interface 11: 100 G Optical Ethernet

S. No.	Parameter Name	Standard Name
3.12.1	Average Launch Power for 100 GE Opt	IEEE 802.3ba Cl. 86, 88, Annex-H
3.12.2	Receiver Sensitivity for 100 GE Opt	IEEE 802.3ba Cl. 86, 88, Annex-H
3.12.3	Wavelength for 100 GE Opt	IEEE 802.3ba Cl. 86, 88, Annex-H

3.13 Interface 12: 200 G Optical Ethernet

S. No.	Parameter Name	Standard Name
3.13.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl. 121, 122
3.13.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl. 121, 122
3.13.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl. 121, 122

3.14 Interface 13: 400 G Optical Ethernet

S. No.	Parameter Name	Standard Name
3.14.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl. 122, 124
3.14.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl. 122, 124
3.14.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl. 122, 124

3.15 Interface 14: Bluetooth Low Energy/Bluetooth

S. No.	Parameter Name	Standard Name
3.15.1	Basic RF Requirements for BLE Interface	Annex G4 (4.4 to 4.15), ETSI EN 300 328 V2.2.2
3.15.2	EIRP for BLE Interface	WPC GSR 45(E), Annex G4 (4.2)
3.15.3	Frequency of Operation for BLE Interface	Latest NFAP, Annex G4 (4.1)
3.15.4	Maximum Transmitted Power for BLE Interface	WPC GSR 45(E), Annex G4 (4.3)

3.16 Interface 15: Geolocation Navigation Interface

S. No.	Parameter Name	Standard Name
3.16.1	GPS for IoT	Annexure to ER for Tracking Device
3.16.2	NavIC for IoT	Annexure to ER for Tracking Device

3.17 Interface 16: LPWAN – LoRa

S. No.	Parameter Name	Standard Name
3.17.1	Basic RF Requirements for LPWAN-LoRa	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
3.17.2	EIRP LoRa	WPC GSR 564(E), Annex G5 (5.2)
3.17.3	Frequency of Operation for LoRa Int	Latest NFAP, Annex G5 (5.1)
3.17.4	Maximum Transmit Power LoRa	WPC GSR 564(E), Annex G5 (5.3)

3.18 Interface 17: LPWAN – Sigfox

S. No.	Parameter Name	Standard Name
3.18.1	Basic RF Requirements for LPWAN - SigFox	Annex G5 (5.4 to 5.18), ETSI EN 300 220-2 V3.2.1
3.18.2	EIRP SigFox	WPC GSR 564(E), Annex G5 (5.2)
3.18.3	Frequency of Operation for SigFox Int	Latest NFAP, Annex G5 (5.1)
3.18.4	Maximum Transmit Power SigFox	WPC GSR 564(E), Annex G5 (5.3)

3.19 Interface 18: NFC

S. No.	Parameter Name	Standard Name
3.19.1	Basic RF Requirements for NFC Int	Annex G6 (6.2 to 6.13), ETSI EN 300 330 V2.1.1
3.19.2	Frequency of Operation for NFC Int	Latest NFAP, Annex G6 (6.1)

3.20 Interface 19: GSM or GPRS or EDGE

S. No.	Parameter Name	Standard Name
3.20.1	Int Parameters for GSM or GPRS or EDGE	3GPP TS 51 010-1 or EN 301 511. Annex F10
3.20.2	Operating Frequency for GSM or GPRS or EDGE Int	NFAP. Annex-F

3.21 Interface 22: LTE or LTE A

S. No.	Parameter Name	Standard Name
3.21.1	Int Parameters for LTE or LTE-A	3GPP TS 36.521-1 or EN 301 908-13, Annex-F12
3.21.2	Operating Frequency for LTE or LTE-A Int	NFAP, Annex-F

3.22 Interface 23: 5G NR (FR1)

S. No.	Parameter Name	Standard Name
3.22.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1, Annex-F14
3.22.2	Operating Frequency for 5G NR (FR1)	NFAP, Annex-F

3.23 Interface 24: 5G NR – FR1 and FR2 interworking with other Radios

S. No.	Parameter Name	Standard Name
3.23.1	Int Parameters for 5G NR-FR1 and FR2	3GPP TS 38.521-3, Annex-F13

	interworking with other Radios	
3.23.2	Operating Frequency for 5G NR-FR1 and FR2 interworking	NFAP, Annex-F

3.24 Interface 25: 5G NR (FR2)

S. No.	Parameter Name	Standard Name
3.24.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2, Annex-F15
3.24.2	Operating Frequency for 5G NR (FR2)	NFAP, Annex-F

3.25 Interface 26 : Wi-Fi

S.No.	Parameter Name	Standard Name
3.25.1	2.4 GHz Wi-Fi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
3.25.2	5 GHz Wi-Fi 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
3.25.3	6 GHz Wi-Fi Radio Conformance	ETSI EN 303 687 or FCC CFR 47 Part 15.407 Annex-G3
3.25.4	EIRP for Wi-Fi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
3.25.5	Frequency for Wi-Fi equipments	DoT WPC GSR No. 45(E) 1048(E) 47(E). Annex- G1

Annexure-G3: Parameters for Radio Interfaces for equipment operating in delicensed frequency bands

Parameter Group: Radio Conformance (RADCONF)

S. No.	Parameter Name	Standard/ Parameter	Applicability/Limits/ Values	Remarks
G3.1	Radio Conformance for all Wi-Fi equipment operating in 2.4 GHz	ETSI EN 300 328 or FCC CFR47 Part15.247 or FCC CFR47 Part 15.249	Refer in ETSI EN 300 328:- Clause 4.2 -Applicable category of equipment on basis of FHSS and non FHSS Clause 4.3 and sub clauses– Conformance tests as per category in clause 4.2 with limits in sub clauses Clause 5 – Test methods For equipment conforming to FCC CFR 47 Part 15.247 / FCC CFR 47 Part 15.249 Radio Conformance shall be taken as indicated in the Standard therein. However, the test method shall be as per clause	Wi-Fi Interface & PTP/PMP Wireless Access Equipment in 2.4 GHz *Note:* *Radio conformance requirements/limits, mentioned in NFAP and GSR 45 (E) issued by WPC, which inter alia include effective radiated power, output power of transmitter, shall supersede the requirements listed here or in aforementioned*

			5 of ETSI EN 300 328.	*International standards.* *However, for Test methods corresponding to such quantities, ETSI EN 300 328 standard shall be applicable*
G3.2	Radio Conformance for RLAN/WLAN Wi-Fi	ETSI EN 301 893 or	Test requirements and limits as per EN 301 893 for frequency bands i.e. 5.150-5.250 GHz, 5.250-5.350 GHz 5.470-5.725 GHz and 5.725-5.875 GHz*.	Wi-Fi Interface

	equipment operating in 5 GHz	or FCC CFR47 Part 15.407	Or Test requirements and limits as per FCC CFR 47 Part 15.407 for **5.150-5.250 GHz, 5.250- 5.350 GHz, 5.470-5.725 GHz and 5.725-5.875 GHz**	***Note:*** *Radio conformance requirements/limits, mentioned in NFAP and GSR 1048 (E) issued by WPC, which inter alia include EIRP, power spectral density, conducted output power, bandwidth, out of band emission, shall supersede the requirements listed here or in aforementioned International standards.* *However, for Test methods corresponding to such quantities, aforementioned standards shall be applicable*
G3.3	Radio Conformance for PTP/PMP Wireless Access Equipment operating in 5 GHz	ETSI EN 301 893 or ETSI EN 302 502, as applicable or FCC CFR47 Part 15.249 Or FCC CFR47 Part	Test requirements and limits as per EN 301 893 for frequency band 5.150- 5.250 GHz, 5.250-5.350 GHz, 5.470-5.725 GHz Test requirements and limits as per EN 302 502 for frequency band 5.725-5.875 GHz Except clauses 4.2.4, 4.2.6 and 4.2.8 of EN 302 502 in **5.725-5.875 GHz band**) or Test requirements and limits as per FCC CFR 47	PTP/PMP Wireless Access Equipment or PTP/PMP Fixed Radio system in 5 GHz. ***Note:*** *Radio conformance requirements/limits, mentioned in NFAP and GSR 1048 (E) issued by WPC, which inter alia include EIRP, power spectral density, conducted output power, bandwidth, out of*

		15.407	Part 15.407 for **5.150-5.250 GHz, 5.250- 5.350 GHz, 5.470-5.725 GHz and 5.725-** **5.875 GHz** **Or** Test requirements and limits as per FCC CFR47 Part 15.249 **for 5.725-5.875 GHz**	*band emission, shall supersede the requirements listed here or in aforementioned international standards.* *However, for Test methods corresponding to such quantities, aforementioned standards shall be applicable.*
G3.4	Radio Conformance for RLAN/WLAN Wi-Fi equipment operating in **6 GHz band**	ETSI EN 303 687 **or** FCC CFR 47 Part 15.407	Test requirements and limits as per **ETSI EN 303 687** for frequency band **5925–6425 MHz**. **or** Test requirements and limits as per **FCC CFR 47 Part 15.407** for frequency band **5925–6425 MHz**	Wi-Fi Interface equipment operating in **6 GHz** **Note:** Radio conformance requirements/limits, mentioned in **NFAP** and **Gazette Notification G.S.R. 47(E) dated 20.01.2026** issued by WPC, which *inter alia* include maximum **e.i.r.p., power spectral density, conducted output power, bandwidth and out-of-band emission**, shall supersede the requirements listed here or in the aforementioned International standards. However, for **test methods** corresponding to such quantities, **ETSI EN 303 687 / FCC CFR 47 Part 15.407** standards shall be applicable.

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