

अनिवार्य आवश्यकताएँ

संख्या : TEC24492108

Essential Requirements

ER No. : TEC24492108

IoT Gateway

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दूरसंचार अभियांत्रिकी केंद्र

भारत सरकार

खुर्शीद लाल भवन, जनपथ, नई दिल्ली - 110001, भारत

Telecommunication Engineering Centre

Government of India

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

Essential Requirements for:

IoT Gateway

Certification Scheme: **GCS**

Product Fee Group: **B**

This ER covers all types of IoT Gateways with Cellular Connectivity, Fixed line connectivity, LPWAN(LoRa and Sigfox) and Short range technologies(NFC, RFID etc.)

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. IoT Gateway

1. Variant 1 : IoT Gateway

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 22/32 EN55022/32. Annex-B |
| 1.1.2 | Conducted And Radiated Emission - Class B | TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B |
| 1.1.3 | Dual IP Parameters | RFC 4213. Annex-P6 |
| 1.1.4 | GPS Compliance | Compliance to Gol notification GSR no. 436(E). |
| 1.1.5 | Immunity to AC Voltage Dips and Short Interruptions | TEC EMI EMC Standard EN/IEC:61000-4-34 for input current above 16 Ampere. Annex-B |
| 1.1.6 | Immunity to DC Voltage Dips and Short Interruptions | EN/IEC:61000-4-29. Annex-B |
| 1.1.7 | Immunity to Electrostatic Discharge | TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B |

| | | |
|--------|--|--|
| 1.1.8 | Immunity to Fast Transients (Burst) | TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B |
| 1.1.9 | Immunity to Radiated RF | TEC EMI EMC Standard EN/IEC:61000-4-3 Test Level -2. Annex-B |
| 1.1.10 | Immunity to RF Field Induced Conducted Disturbance | TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B |
| 1.1.11 | Immunity to Surges | TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B |
| 1.1.12 | IoT Dev - Non-0 IMEI or MEID or Unique MAC | Annex-M |
| 1.1.13 | IPV4 Parameters | RFC 791. Annex-P6 |
| 1.1.14 | IPV6 Parameters | RFC 2460 / 8200. Annex-P7 |
| 1.1.15 | IT Equipment Safety | IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1 |

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 : 40 G Optical Ethernet

| S.No. | Parameter Name | Standard Name |
|-------|------------------------------------|---------------------------------|
| 1.3.1 | Average Launch power for 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |
| 1.3.2 | Receiver Sensitivity 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |
| 1.3.3 | Wavelength for 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |

1.4 Interface 3 : 6LoWPAN

| S.No. | Parameter Name | Standard Name |
|-------|---|---|
| 1.4.1 | Basic RF Requirements for 6LowPAN Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.4.2 | EIRP for 6LowPAN Interface | WPC GSR 45(E). Annex-G4(4.2) |
| 1.4.3 | Frequency of operation for 6LowPAN | Latest NFAP Annex-G4(4.1) |

| | | |
|-------|---|-------------------------------|
| | Interface | |
| 1.4.4 | Maximum Transmitted Power for 6LowPAN Int | WPC GSR 45(E). Annex-G4 (4.3) |

1.5 Interface 4 : ADSL

| S.No. | Parameter Name | Standard Name |
|-------|--|---------------------------|
| 1.5.1 | Bit Rate for ADSL Int | ANSI.T1.413-2. Annex-J1 |
| 1.5.2 | Impulse Noise Protection for ADSL Int | Annex-J1 |
| 1.5.3 | Insulation Test for 2 wire Int | ETSI EN 300 001. Annex-D |
| 1.5.4 | Insulation Test for ADSL Int | Annex-J1 |
| 1.5.5 | Line Port impedance for ADSLx Int | Annex-J1 |
| 1.5.6 | Loop resistance for ADSLx | ETSI EN 300 001. Annex-J1 |
| 1.5.7 | PSD for ADSL Int | G.992.3 G992.5. Annex-J1 |
| 1.5.8 | Transmitted Power At ATU-C for ADSLx Int | Annex-J1 |

1.6 Interface 5 : BLE for IoT

| S.No. | Parameter Name | Standard Name |
|-------|--|---|
| 1.6.1 | Basic RF Requirements for BLE Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.6.2 | EIRP for BLE Interface | WPC GSR 45(E). Annex-G4 (4.2) |
| 1.6.3 | Frequency of Operation for BLE Interface | Latest NFAP. Annex-G4(4.1) |
| 1.6.4 | Maximum Transmitted Power for BLE Int | WPC GSR 45(E). Annex-G4 (4.3) |

1.7 Interface 6 : CDMA

| S.No. | Parameter Name | Standard Name |
|-------|----------------------------------|---|
| 1.7.1 | CDMA Int Parameters | 1xS0011 or EN 301 908-04 CDMA. Annex-F9 |
| 1.7.2 | Operating Frequency for CDMA Int | NFAP. Annex-F |

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 : Fast Ethernet Optical

| S.No. | Parameter Name | Standard Name |
|-------|---------------------------------|----------------------|
| 1.9.1 | Average Launch power for FE Opt | IEEE 802.3u. Annex-H |
| 1.9.2 | Receiver Sensitivity for FE Opt | IEEE 802.3u. Annex-H |
| 1.9.3 | Wavelength for FE Opt | IEEE 802.3u. Annex-H |

1.10 Interface 9 : Gigabit Ethernet Electrical

| S.No. | Parameter Name | Standard Name |
|--------|--|---------------------|
| 1.10.1 | Link Speed and Autonegotiation Test GE | IEEE 802.3. Annex-H |

1.11 Interface 10 : GSM or GPRS or EDGE

| S.No. | Parameter Name | Standard Name |
|--------|---|---|
| 1.11.1 | Int Parameters for GSM or GPRS or EDGE | 3GPP TS 51 010-1 or EN 301 511. Annex-F10 |
| 1.11.2 | Operating Frequency for GSM or GPRS or EDGE Int | NFAP. Annex-F |

1.12 Interface 11 : LPWAN - LoRa

| S.No. | Parameter Name | Standard Name |
|--------|--------------------------------------|--|
| 1.12.1 | Basic RF Requirements for LPWAN-LoRa | Annex- G5(5.4 to 5.18). ETSI EN 300 220-2 V3.2.1 |
| 1.12.2 | EIRP LoRa | WPC GSR 564(E). Annex- G5(5.2). |
| 1.12.3 | Frequency of Operation for LoRa Int | Latest NFAP. Annex- G5(5.1) |
| 1.12.4 | Maximum Transmit Power LoRa | WPC GSR 564(E). Annex- G5(5.3). |

1.13 Interface 12 : LPWAN - SigFox

| S.No. | Parameter Name | Standard Name |
|--------|--|---|
| 1.13.1 | Basic RF Requirements for LPWAN - SigFox | Annex- G5(5.4 to 5.18). ETSI EN 300 220-2 V3.2.1. |
| 1.13.2 | EIRP SigFox | WPC GSR 564(E). Annex- G5(5.2). |
| 1.13.3 | Frequency of Operation for SigFox Int | Latest NFAP. Annex- G5(5.1) |
| 1.13.4 | Maximum Transmit Power SigFox | WPC GSR 564(E). Annex- G5(5.3). |

1.14 Interface 13 : LTE or LTE-A

| S.No. | Parameter Name | Standard Name |
|--------|--|--|
| 1.14.1 | Int Parameters for LTE or LTE-A | 3GPP TS 36.521-1 or EN 301 908-13. Annex-F12 |
| 1.14.2 | Operating Frequency for LTE or LTE-A Int | NFAP. Annex-F |

1.15 Interface 14 : NFC for IoT

| S.No. | Parameter Name | Standard Name |
|--------|-------------------------------------|---|
| 1.15.1 | Basic RF Requirements for NFC - Int | Annex- G6 (6.2 to 6.13). ETSI EN 300 330 V2.1.1 |
| 1.15.2 | Frequency of Operation for NFC Int | Latest NFAP. Annex-G6(6.1) |

1.16 Interface 15 : SHDSL

| S.No. | Parameter Name | Standard Name |
|--------|---|-------------------|
| 1.16.1 | Impedance Unbalance About Earth for SHDSL Int | G.991.2. Annex-J1 |
| 1.16.2 | Insulation Resistance for SHDSL int | G.991.2. Annex-J1 |
| 1.16.3 | LCL for SHDSL Interface | G.991.2. Annex-J1 |
| 1.16.4 | PSD for SHDSL Int | G.991.2. Annex-J1 |
| 1.16.5 | Return Loss for SHDSL | G.991.2. Annex-J1 |
| 1.16.6 | Throughput for SHDSL Interface | G.991.2. Annex-J1 |
| 1.16.7 | Transmitted Power for SHDSL Int | G.991.2. Annex-J1 |

1.17 Interface 16 : VDSL

| S.No. | Parameter Name | Standard Name |
|--------|-----------------------------------|--|
| 1.17.1 | Bit Rate for VDSLx Int | G.993.1 and G993.2. Annex-J1 |
| 1.17.2 | Insulation Test for 2 wire Int | ETSI EN 300 001. Annex-D |
| 1.17.3 | Line Port impedance for VDSLx Int | Annex-J1 |
| 1.17.4 | Loop resistance for VDSLx | ETSI EN 300 001. Annex-J1 |
| 1.17.5 | Profiles for VDSLx | G.993.2(cl 7.2). Annex-J1 |
| 1.17.6 | PSD for VDSLx Int | G.993.1(cl 6.2). G.993.2(cl 7.2) Ann-A B C. Annex-J1 |

| | | |
|--------|--|---------------------------|
| 1.17.7 | Return Loss for VDSLx | G.993.1 Cl. 6.5. Annex-J1 |
| 1.17.8 | Transmitted Power At ATU-C for VDSLx Int | Annex-J1 |

1.18 Interface 17 : WCDMA or HSPA

| S.No. | Parameter Name | Standard Name |
|--------|---|---|
| 1.18.1 | Operating Frequency for WCDMA or HSPA Int | NFAP. Annex-F |
| 1.18.2 | WCDMA or HSPA Int Parameters | 3GPP TS 34.121-1 or EN 301 908-2. Annex-F11 |

1.19 Interface 18 : WiFi

| S.No. | Parameter Name | Standard Name |
|--------|--------------------------------|---|
| 1.19.1 | 2.4 GHz WiFi Radio Conformance | ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3 |
| 1.19.2 | 5 GHz WiFi Radio Conformance | ETSI EN 301 893 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3 |
| 1.19.3 | EIRP for Wifi Interface | Latest NFAP and GSRs issued by DoT WPC. Annex-G2 |
| 1.19.4 | Frequency for WiFi equipments | DoT WPC GSR No. 45(E) 1048(E). Annex-G1 |

1.20 Interface 19 : ZigBee

| S.No. | Parameter Name | Standard Name |
|--------|---|---|
| 1.20.1 | Basic RF Requirements for ZigBee Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.20.2 | EIRP for ZigBee Interface | WPC GSR 45(E). Annex-G4 (4.2) |
| 1.20.3 | Frequency of Operation for ZigBee Interface | Latest NFAP. Annex-G4(4.1) |
| 1.20.4 | Maximum Transmitted Power for ZigBee Int | WPC GSR 45(E). Annex-G4 (4.3) |