**Government of India**
**Department of Telecommunications**
**Telecommunication Engineering Centre**
**Gate No. 5, Khurshid Lal Bhawan, Janpath, New Delhi-110001.**
**(IoT Division)**

File No: 2-20/2023-IoT/TEC Date: 17 October 2025

**Subject: Revision of Standard for Essential Requirements (ER) of "IoT Gateway" – Inviting comments.**

In exercise of the powers conferred by rule 5(2) of the Telecommunications (Framework to Notify Standards, Conformity Assessment and Certification) Rules 2025, a draft revision of Standard of Essential Requirements (ER) on "IoT Gateway" is enclosed herewith (Annexure-I) for stakeholder consultation. It is requested to go through the enclosed draft Standard for revision and offer your inputs/comments. The comments may please be furnished in the template sheet enclosed herewith as Annexure-II.

The comments/inputs may be furnished through email to adet.iottec-dot@gov.in with copy to adg.iot-tec-dot@gov.in and ddgsd.tec@gov.in at the earliest and latest within **sixty days of the date of this reference** please.

Enclosures:

(i) Draft Revision of Standard for Essential Requirements of "IoT Gateway" (Annexure-I)

(ii) Template sheet for providing comments/inputs (Annexure-II)

Digitally signed by Raghav Purwar
Date: 17-10-2025 15:07:01

**(Raghav Purwar)**
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**To,**

**All Stakeholders (through portal)**

**Copy to:**

1. **Sr. DDG & Head, TEC**
2. **AD (IT), TEC** – for uploading on TEC Portal

# अनिवार्य आवश्यकताएं संख्या : TEC24492402

# Essential Requirements
# ER No. : TEC24492402

## IoT Gateway



MTCTE के तहत जारी:
Issued under MTCTE by:

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: **SCS** Product Fee Group: **B**

This ER covers all types of IoT Gateways working on wired or wireless (cellular/ non cellular) communication technologies

*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 or Class B | TEC EMI EMC Standard CISPR 32 EN55032. Class A or Class B applicabilityas defined in Notes to Annex-B. |
| 1.1.2 | Dual IP Parameters | RFC 4213, RFC 791 Annex-P6, ~~RFC 4213~~RFC 8200. Annex-~~-P6~~ P7 |
| 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 |
| 1.1.10 | IoT Dev - Non-0 IMEI or MEID or Unique MAC | Annex-M |
| ~~1.1.11~~ | ~~IPV4 Parameters~~ | ~~RFC 791. Annex-P6~~ |
| 1.1.12 | IPV6 Parameters | RFC 2460 / 8200. Annex-P7 |
| 1.1.13 | IT Equipment Safety | 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 : 200 G Optical Ethernet**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.3.1 | Average Launch Power for 200 GE Opt | IEEE 802.3cn Cl 121 Cl 122 |
| 1.3.2 | Receiver Sensitivity for 200 GE Opt | IEEE 802.3cn Cl 121 Cl 122 |
| 1.3.3 | Wavelength for 200 GE Opt | IEEE 802.3cn Cl 121 Cl 122 |

**1.4 Interface 3 : 400 G Optical Ethernet**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.4.1 | Average Launch Power for 400 GE Opt | IEEE 802.3cn Cl 122 Cl 124 |
| 1.4.2 | Receiver Sensitivity for 400 GE Opt | IEEE 802.3cn Cl 122 Cl 124 |
| 1.4.3 | Wavelength for 400 GE Opt | IEEE 802.3cn Cl 122 Cl 124 |

**1.5 Interface 4 : 40 G Optical Ethernet**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.5.1 | Average Launch power for 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |

| | | |
|---|---|---|
| 1.5.2 | Receiver Sensitivity 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |
| 1.5.3 | Wavelength for 40 GE Opt | IEEE 802.3ba Cl. 86 87. Annex-H |

**1.6 Interface 5 : 5G NR (FR1)**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.6.1 | Additional spectrum emission mask for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.2.3 |
| 1.6.2 | Additional spectrum emission mask-Transmitter | 3GPP TS 38.521-1 Clause 6.5.2.3 |
| 1.6.3 | Additional spurious emissions | 3GPP TS 38.521-1 Clause 6.5.3.3 |
| 1.6.4 | Additional spurious emissions for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.3.3 |
| 1.6.5 | Adjacent channel selectivity | 3GPP TS 38.521-1 Clause 7.5 |
| 1.6.6 | Adjacent channel selectivity for 2DL CA | 3GPP TS 38.521-1 Clause 7.5A.1 |
| 1.6.7 | Adjacent channel selectivity for UL-MIMO | 3GPP TS 38.521-1 Clause 7.5D |
| 1.6.8 | General spurious emissions for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.3.1 |
| 1.6.9 | General spurious emissions-Transmitter | 3GPP TS 38.521-1 Clause 6.5.3.1 |
| 1.6.10 | Inband Blocking | 3GPP TS 38.521-1 Clause 7.6.2 |
| 1.6.11 | In-band Blocking for CA-2DL CA | 3GPP TS 38.521-1 Clause 7.6A.2.1 |
| 1.6.12 | Inband blocking for UL-MIMO | 3GPP TS 38.521-1 Clause 7.6D.2 |
| 1.6.13 | Minimum output power | 3GPP TS 38.521-2 Clause 6.3.1 |
| 1.6.14 | Narrow band blocking | 3GPP TS 38.521-1 Clause 7.6.4 |
| 1.6.15 | Narrow band blocking for CA-2DL CA | 3GPP TS 38.521-1 Clause 7.6A.4.1 |
| 1.6.16 | Narrow band blocking for UL-MIMO | 3GPP TS 38.521-1 Clause 7.6D.4 |
| 1.6.17 | NR ACLR | 3GPP TS 38.521-1 Clause 6.5.2.4.1 |
| 1.6.18 | NR ACLR for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.2.4.1 |
| 1.6.19 | Out-of-band blocking | 3GPP TS 38.521-1 Clause 7.6.3 |
| 1.6.20 | Out-of-band blocking for UL-MIMO | 3GPP TS 38.521-1 Clause 7.6D.3 |
| 1.6.21 | Reference sensitivity power level | 3GPP TS 38.521-1 Clause 7.3.2 |
| 1.6.22 | Reference sensitivity power level for 2DL CA without exception | 3GPP TS 38.521-1 Clause 7.3A.1 |
| 1.6.23 | Reference sensitivity power level for UL-MIMO | 3GPP TS 38.521-1 Clause 7.3D.2 |

| | | |
|---|---|---|
| 1.6.24 | Spectrum Emission Mask-5G NR FR1 | 3GPP TS 38.521-1 Clause 6.5.2.2 |
| 1.6.25 | Spectrum emission Mask for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.2.2 |
| 1.6.26 | Spurious emission for 2DL CA | 3GPP TS 38.521-1 Clause 7.9A.1 |
| 1.6.27 | Spurious emission for UE co-existence | 3GPP TS 38.521-1 Clause 6.5.3.2 |
| 1.6.28 | Spurious emission for UE co-existence for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.3.2 |
| 1.6.29 | Spurious emissions-5G NR FR1 | 3GPP TS 38.521-1 Clause 7.9 |
| 1.6.30 | Spurious response | 3GPP TS 38.521-1 Clause 7.7 |
| 1.6.31 | Spurious response for 2DL CA | 3GPP TS 38.521-1 Clause 7.7A.1 |
| 1.6.32 | Spurious response for UL-MIMO | 3GPP TS 38.521-1 Clause 7.7D |
| 1.6.33 | UE Maximum Output Power | 3GPP TS 38.521-1 Clause 6.2.1 |
| 1.6.34 | UE maximum output power for UL-MIMO | 3GPP TS 38.521-1 Clause 6.2D.1 |
| 1.6.35 | UE maximum output power reduction for UL-MIMO | 3GPP TS 38.521-1 Clause 6.2D.2 |
| 1.6.36 | UTRA ACLR | 3GPP TS 38.521-1 Clause 6.5.2.4.2 |
| 1.6.37 | UTRA ACLR for UL MIMO | 3GPP TS 38.521-1 Clause 6.5D.2.4.2 |
| 1.6.38 | Wide band Intermodulation | 3GPP TS 38.521-1 Clause 7.8.2 |
| 1.6.39 | Wide band Intermodulation for CA-2DL CA | 3GPP TS 38.521-1 Clause 7.8A.2.1 |
| 1.6.40 | Wide band Intermodulation for UL-MIMO | 3GPP TS 38.521-1 Clause 7.8D.2 |

**1.7 Interface 6 : 5G NR- FR1 and FR2 interworking with other Radios**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.7.1 | Additional Spectrum emissions mask for inter-band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.5B.2.3.2 |
| 1.7.2 | Additional Spurious emissions for inter-band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.5B.4.3 |
| 1.7.3 | Adjacent channel leakage ratio for Inter-band EN-DC including FR2 2CCs | 3GPP TS 38.521-3 Clause 6.5B.2.4.3 |
| 1.7.4 | Adjacent channel leakage ratio for inter-band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.5B.2.3.3 |
| 1.7.5 | Adjacent channel selectivity for inter-band EN-DC within FR1 2CCs | 3GPP TS 38.521-3 3GPP TS 38.521-3 Clause 7.5B.3 |
| 1.7.6 | Adjacent channel selectivity for intra-band | 3GPP TS 38.521-3 Clause 7.5B.1 |

| | | |
|---|---|---|
| | contiguous EN-DC 2CCs | |
| 1.7.7 | General spurious emissions for inter-band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.5B.3.3.1 |
| 1.7.8 | General spurious emissions for intra-band contiguous EN-DC | 3GPP TS 38.521-3 Clause 6.5B.3.1.1 |
| 1.7.9 | Inband blocking for inter-band EN-DC within FR1-2CCs | 3GPP TS 38.521-3 Clause 7.6B.2.3 |
| 1.7.10 | Inband blocking for intra-band contiguous EN-DC in FR1-2CCs | 3GPP TS 38.521-3 Clause 7.6B.2.1 |
| 1.7.11 | Minimum output power for EN-DC Inter-band including FR2 | 3GPP TS 38.521-3 Clause 6.3B.1.4 |
| 1.7.12 | Minimum Output Power for intra-band contiguous EN-DC | 3GPP TS 38.521-3 Clause 6.3B.1.1 |
| 1.7.13 | Minimum output power for intra-band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.3B.1.3 |
| 1.7.14 | Narrow band blocking for inter band EN DC within FR1 2CCs | 3GPP TS 38.521-3 Clause 7.6B.4.3 |
| 1.7.15 | Narrow band blocking for intra band contiguous EN DC in FR1 2CCs | 3GPP TS 38.521-3 Clause 7.6B.4.1 |
| 1.7.16 | Out-of-band blocking for inter-band EN-DC within FR1-2CCs | 3GPP TS 38.521-3 Clause 7.6B.3.3 |
| 1.7.17 | Out-of-band blocking for intra-band contiguous EN-DC in FR1-2CCs | 3GPP TS 38.521-3 Clause 7.6B.3.1 |
| 1.7.18 | Reference sensitivity for EN-DC within FR1 3CCs | 3GPP TS 38.521-3 Clause 7.3B.2.3_1.1 |
| 1.7.19 | Reference sensitivity for inter-band EN-DC including FR2 | 3GPP TS 38.521-3 Clause 7.3B.2.4 |
| 1.7.20 | Reference sensitivity for inter-band EN-DC within FR1 2CCs | 3GPP TS 38.521-3 Clause 7.3B.2.3 |
| 1.7.21 | Reference sensitivity for intra-band contiguous EN-DC 2CCs | 3GPP TS 38.521-3 Clause 7.3B.2.1 |
| 1.7.22 | Spectrum emissions mask for inter-band EN-DC including FR2 (2 CCs) | 3GPP TS 38.521-3 Clause 6.5B.2.4.1 |
| 1.7.23 | Spectrum emissions mask for inter- band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.5B.2.3.1 |

| | | |
|---|---|---|
| 1.7.24 | Spurious emission band UE co-existence for intra-band contiguous EN-DC | 3GPP TS 38.521-3 Clause 6.5B.3.1.2 |
| 1.7.25 | Spurious emissions band UE co-existence for inter-band within FR1 | 3GPP TS 38.521-3 Clause 6.5B.3.3.2 |
| 1.7.26 | Spurious Emissions for EN DC within FR1 3CCs | 3GPP TS 38.521-3 Clause 7.9B.3 1.1 |
| 1.7.27 | Spurious Emissions for inter band EN DC within FR1 2CCs | 3GPP TS 38.521-3 Clause 7.9B.3 |
| 1.7.28 | Spurious emissions for intra band contiguous EN DC in FR1 2CCs | 3GPP TS 38.521-3 Clause 7.9B.1 |
| 1.7.29 | Spurious Response for inter band EN DC within FR1 2CCs | 3GPP TS 38.521-3 Clause 7.7B.3 |
| 1.7.30 | Spurious Response for intra band contiguous EN DC in FR1 2CCs | 3GPP TS 38.521-3 Clause 7.7B.1 |
| 1.7.31 | UE Maximum Output Power for Inter-Band EN-DC including FR2 - EIRP and TR | 3GPP TS 38.521-3 Clause 6.2B.1.4.1 |
| 1.7.32 | UE Maximum Output Power for Inter-Band EN-DC including FR2 - Spherical Coverage | 3GPP TS 38.521-3 Clause 6.2B.1.4.2 |
| 1.7.33 | UE Maximum Output Power for Inter-Band EN-DC within FR1 | 3GPP TS 38.521-3 Clause 6.2B.1.3 |
| 1.7.34 | UE Maximum Output Power for Intra-Band Contiguous EN-DC | 3GPP TS 38.521-3 Clause 6.2B.1.1 |
| 1.7.35 | Wideband Intermodulation for inter band EN DC in FR1 2CCs | 3GPP TS 38.521-3 Clause 7.8B.2.3 |
| 1.7.36 | Wideband Intermodulation for intra band contiguous EN DC in FR1 | 3GPP TS 38.521-3 Clause 7.8B.2.1 |

**1.8 Interface 7 : 5G NR (FR2)**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.8.1 | Adjacent channel leakage ratio | 3GPP TS 38.521-2 Clause 6.5.2.3 |
| 1.8.2 | Minimum Output power-Transmitter | 3GPP TS 38.521-1 Clause 6.3.1 |
| 1.8.3 | Reference sensitivity power level | 3GPP TS 38.521-1 Clause 7.3.2 |
| 1.8.4 | Spectrum Emission Mask-5G NR FR2 | 3GPP TS 38.521-2 Clause 6.5.2.1 |
| 1.8.5 | UE maximum output power-EIRP and TRP | 3GPP TS 38.521-2 Clause 6.2.1.1 |

| | | |
|---|---|---|
| 1.8.6 | UE maximum output power reduction | 3GPP TS 38.521-2 Clause 6.2.2 |
| 1.8.7 | UE maximum output power-Spherical coverage | 3GPP TS 38.521-2 Clause 6.2.1.2 |
| 1.8.8 | UE maximum output power with additional requirements | 3GPP TS 38.521-2 Clause 6.2.3 |

**1.9 Interface 8 : 6LoWPAN (2.4 GHz)**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.9.1 | Basic RF Requirements for 6LowPAN Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.9.2 | EIRP for 6LowPAN Interface | WPC GSR 45(E). Annex-G4(4.2) |
| 1.9.3 | Frequency of operation for 6LowPAN Interface | Latest NFAP Annex-G4(4.1) |
| 1.9.4 | Maximum Transmitted Power for 6LowPAN Int | WPC GSR 45(E). Annex-G4 (4.3) |

**Interface : 6LoWPAN (865 to 868~~7~~ MHz)**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.6.1 | Basic RF Requirements for 6LowPAN Interface | Annex- G5(5.4 to 5.2018~~18~~). ETSI EN 300 220-2 V3.2.1 |
| 1.6.2 | EIRP for 6LowPAN Interface | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.2) |
| 1.6.3 | Frequency of operation for 6LowPAN Interface | Latest NFAP. Annex- G5(5.1) |
| 1.6.4 | Maximum Transmitted Power for 6LowPAN Int | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.3). |

**1.10 Interface 9 : ADSLx**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.10.1 | Bit Rate for ADSLx Int | Annex-J1 |
| 1.10.2 | Impulse Noise Protection for ADSL Int | Annex-J1 |
| 1.10.3 | Insulation Test for ADSL Int | Annex-J1 |
| 1.10.4 | Line Port impedance for ADSLx Int | Annex-J1 |

| | | |
|---|---|---|
| 1.10.5 | Loop resistance for ADSLx | ETSI EN 300 001. Annex-J1 |
| 1.10.6 | PSD for ADSLx Int | Annex-J1 |
| 1.10.7 | Transmitted Power At ATU-C for ADSLx Int | Annex-J1 |

**1.11 Interface 10 : BLE for IoT**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.11.1 | Basic RF Requirements for BLE Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.11.2 | EIRP for BLE Interface | WPC GSR 45(E). Annex-G4 (4.2) |
| 1.11.3 | Frequency of Operation for BLE Interface | Latest NFAP. Annex-G4(4.1) |
| 1.11.4 | Maximum Transmitted Power for BLE Int | WPC GSR 45(E). Annex-G4 (4.3) |

**1.12 Interface 11 : CDMA**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.12.1 | CDMA Int Parameters | 1xS0011 or EN 301 908-04 CDMA. Annex-F9 |
| 1.12.2 | Operating Frequency for CDMA Int | NFAP. Annex-F |

**1.13 Interface 12 : Fast Ethernet Electrical**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.13.1 | Link Speed and Autonegotiation Test FE | IEEE 802.3 Annex-H |

**1.14 Interface 13 : Fast Ethernet Optical**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.14.1 | Average Launch power for FE Opt | IEEE 802.3u. Annex-H |
| 1.14.2 | Receiver Sensitivity for FE Opt | IEEE 802.3u. Annex-H |
| 1.14.3 | Wavelength for FE Opt | IEEE 802.3u. Annex-H |

**1.15 Interface 14 : Geolocation Navigation Interface for IoT**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.15.1 | GPS for IoT | Annexure to ER for Tracking Device |
| 1.15.2 | NavIC for IoT | Annexure to ER for Tracking Device |

**1.16 Interface 15 : Gigabit Ethernet Electrical**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.16.1 | Link Speed and Autonegotiation Test GE | IEEE 802.3. Annex-H |

**1.17 Interface 16 : GSM or GPRS or EDGE**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.17.1 | Int Parameters for GSM or GPRS or EDGE | 3GPP TS 51 010-1 or EN 301 511. Annex-F10 |
| 1.17.2 | Operating Frequency for GSM or GPRS or EDGE Int | NFAP. Annex-F |

**1.18 Interface 17 : LPWAN - LoRa**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.18.1 | Basic RF Requirements for LPWAN-LoRA | Annex- G5(5.4 to 5.2018). ETSI EN 300 220-2V3.2.1 |
| 1.18.2 | EIRP LoRa | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.2). |
| 1.18.3 | Frequency of Operation for LoRa Int | Latest NFAP. Annex- G5(5.1) |
| 1.18.4 | Maximum Transmit Power LoRa | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.3). |

**1.19 Interface 18 : LPWAN - SigFox**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.19.1 | Basic RF Requirements for LPWAN - SigFox | Annex- G5(5.4 to 5.2018). ETSI EN 300 220-2V3.2.1. |
| 1.19.2 | EIRP SigFox | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.2). |
| 1.19.3 | Frequency of Operation for SigFox Int | Latest NFAP. Annex- G5(5.1) |
| 1.19.4 | Maximum Transmit Power SigFox | WPC GSR 853 (E)~~WPC GSR 564(E).~~ Annex-G5(5.3). |

**1.20 Interface 19 : LTE or LTE-A**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.20.1 | Int Parameters for LTE or LTE-A | 3GPP TS 36.521-1 or EN 301 908-13. Annex-F12 |
| 1.20.2 | Operating Frequency for LTE or LTE-A Int | NFAP. Annex-F |

**1.21 Interface 20 : NB-IOT**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.21.1 | Frequency Stability-NB-IOT | 3GPP TS 36.521-1 Clause 6.5.1F |
| 1.21.2 | Maximum output power-NB-IOT | 3GPP TS 36.521-1 Clause 6.2.2F |
| 1.21.3 | Operating Frequency-NB-IOT-Device Equp. shall be capable of operating in at least one of the frequency bands as per the National Freq. Allocation plan | National Frequency Allocation Plan- 2018 Frequency Allocation Table (IND 16) |
| 1.21.4 | Power Control Absolute Power Tolerance-NB-IOT | 3GPP TS 36.521-1 Clause 6.3.5F.1 |

| | | |
|---|---|---|
| 1.21.5 | Receiver Adjacent Channel Selectivity (ACS) -NB-IOT | 3GPP TS 36.521-1 Clause 7.5F |
| 1.21.6 | Receiver In-band blocking-NB-IOT | 3GPP TS 36.521-1 Clause 7.6.1F |
| 1.21.7 | Receiver Reference Sensitivity level-NB-IOT | 3GPP TS 36.521-1 Clause 7.3F |
| 1.21.8 | Receiver spurious emission-NB-IOT | 3GPP TS 36.521-1 Clause 7.9F |
| 1.21.9 | Spectrum emissions mask-NB-IOT | 3GPP TS 36.521-1 Clause 6.6.2.1F |
| 1.21.10 | Spurious emissions-NB-IOT | 3GPP TS 36.521-1 Clause 6.6.3F.1-6.6.3F.2 |

**1.22 Interface 21 : NFC for IoT**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.22.1 | Basic RF Requirements for NFC - Int | Annex- G6 (6.2 to 6.13). ETSI EN 300 330 V2.1.1 |
| 1.22.2 | Frequency of Operation for NFC Int | Latest NFAP. Annex-G6(6.1) |

**1.23 Interface 22 : SHDSL**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.23.1 | Insulation Resistance for SHDSL int | G.991.2. Annex-J1 |
| 1.23.2 | LCL for SHDSL Interface | G.991.2. Annex-J1 |
| 1.23.3 | PSD for SHDSL Int | G.991.2. Annex-J1 |
| 1.23.4 | Return Loss for SHDSL | G.991.2. Annex-J1 |
| 1.23.5 | Throughput for SHDSL Interface | G.991.2. Annex-J1 |
| 1.23.6 | Transmitted Power for SHDSL Int | G.991.2. Annex-J1 |

**1.24 Interface 23 : VDSLx**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.24.1 | Bit Rate for VDSLx Int | G.993.1 or G993.2. Annex-J1 |
| 1.24.2 | Insulation Test for 2 wire Int | ETSI EN 300 001. Annex-D |
| 1.24.3 | Line Port impedance for VDSLx Int | G.993.1 or G.993.2 Annex-J1 |
| 1.24.4 | Loop resistance for VDSLx | ETSI EN 300 001. Annex-J1 |
| 1.24.5 | Profiles for VDSLx | G.993.1 or G.993.2 Annex-J1 |
| 1.24.6 | PSD for VDSLx Int | G.993.1(cl 6.2). G.993.2(cl 7.2) Ann-A B C. Annex-J1 |

| | | |
|---|---|---|
| 1.24.7 | Return Loss for VDSLx | G.993.1 or G.993.2 Annex-J1 |
| 1.24.8 | Transmitted Power At ATU-C for VDSLx Int | G.993.1 or G.993.2 Annex-J1 |

**1.25 Interface 24 : WCDMA or HSPA**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.25.1 | Operating Frequency for WCDMA or HSPA Int | NFAP. Annex-F |
| 1.25.2 | WCDMA or HSPA Int Parameters | 3GPP TS 34.121-1 or EN 301 908-2. Annex-F11 |

**1.26 Interface 25 : WiFi**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.26.1 | 2.4 GHz WiFi Radio Conformance | ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3 |
| 1.26.2 | 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 |
| 1.26.3 | EIRP for Wifi Interface | Latest NFAP and GSRs issued by DoT WPC. Annex-G2 |
| 1.26.4 | Frequency for WiFi equipments | DoT WPC GSR No. 45(E) 1048(E). Annex-G1 |

**1.27 Interface 26 : ZigBee**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1.27.1 | Basic RF Requirements for ZigBee Interface | Annex G4 (4.4 to 4.15). ETSI EN 300 328 V2.2.2. |
| 1.27.2 | EIRP for ZigBee Interface | WPC GSR 45(E). Annex-G4 (4.2) |
| 1.27.3 | Frequency of Operation for ZigBee Interface | Latest NFAP. Annex-G4(4.1) |
| 1.27.4 | Maximum Transmitted Power for ZigBee Int | WPC GSR 45(E). Annex-G4 (4.3) |

**Interface : Wi-SUN (865 to 868 MHz)**

| S.No. | Parameter Name | Standard Name |
|---|---|---|
| 1 | Basic RF Requirements for Wi-SUN Interface | Annex- G5(5.4 to 5.20). ETSI EN 300 220-2 V3.2.1 |

| | | |
|---|---|---|
| 2 | EIRP for Wi-SUN Interface | WPC GSR 853 (E)Annex- G5(5.2) |
| 3 | Frequency of operation for Wi-SUN Interface | Latest NFAP. Annex- G5(5.1) |
| 4 | Maximum Transmitted Power for Wi-SUN Int | WPC GSR 853 (E)Annex- G5(5.3). |

## Interface: oneM2M

**Note: Testing applicable as per available profile(s) in the device**

| S.No. | Profile Details | Standard Name |
|---|---|---|
| 1 | Constrained sensor as ADN with security | oneM2M TS-0025, v3.3.0, clause 5.10 |
| 2 | Constrained actuator as ADN with security | oneM2M TS-0025, v3.3.0, clause 5.11 |

**Annexure – II**

Name …… (of Member/Manufacturer)

Inputs/Comments/Suggestions on Draft Revision of Essential Requirements of IoT Gateway:

| Clause Number | Clause Description | Modified/New Clause | Justification |
|---|---|---|---|
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