

अनिवार्य आवश्यकताएँ

संख्या : TEC57282108

Essential Requirements

ER No. : TEC57282108

Satellite Communication Equipment

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MTCTE के तहत जारी:

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Telecommunication Engineering Centre

Government of India

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

Essential Requirements for:

Satellite Communication Equipment

Certification Scheme: **GCS**

Product Fee Group: **C**

This ER covers all equipment used in Satellite Communication Systems

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. Satellite Amplifier
2. Satellite Baseband Mod or Demod or Controller
3. Satellite Baseband Modem
4. Satellite Baseband Modem Controller
5. Satellite BUC
6. Satellite IF Transreceiver
7. Satellite LNA
8. Satellite LNB
9. Satellite Optimisation Equipment
10. Satellite Radio Frequency Transceiver
11. VSAT Terminals

1. Variant 1 : Satellite Amplifier

1.101 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	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
1.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
1.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
1.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
1.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
1.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
1.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
1.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

2. Variant 2 : Satellite Baseband Mod or Demod or Controller

2.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
2.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
2.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
2.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
2.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
2.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4.

		Annex-B
2.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
2.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
2.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
2.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

2.2 Interface 1 : 1 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.2.1	Average Launch power for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.2.2	Receiver Sensitivity 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.2.3	Wavelength for 1 GE Opt	IEEE 802.3z Cl. 38. 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 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
2.4.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.4.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
2.4.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
2.4.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.4.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

2.5 Interface 4 : Fast Ethernet Electrical

S.No.	Parameter Name	Standard Name
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2.5.1	Link Speed and Autonegotiation Test FE	IEEE 802.3 Annex-H
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2.6 Interface 5 : Gigabit Ethernet Electrical

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

2.7 Interface 6 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
2.7.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
2.7.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
2.7.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
2.7.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K
2.7.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K

2.8 Interface 7 : STM-1 Optical

S.No.	Parameter Name	Standard Name
2.8.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
2.8.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
2.8.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
2.8.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
2.8.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 G.825 Annex-K
2.8.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
2.8.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

2.9 Interface 8 : STM-16 Optical

S.No.	Parameter Name	Standard Name
2.9.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
2.9.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
2.9.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K

2.9.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
2.9.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
2.9.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
2.9.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

2.10 Interface 9 : STM-4 Optical

S.No.	Parameter Name	Standard Name
2.10.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
2.10.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
2.10.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
2.10.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
2.10.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
2.10.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
2.10.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

2.11 Interface 10 : STM-64 Optical

S.No.	Parameter Name	Standard Name
2.11.1	Input Jitter Tolerance for STM-64 Opt	ITU-T G.825. Annex-K
2.11.2	Mean Launched Power for STM-64 Opt Int	ITU-T G.691. Annex-K
2.11.3	Nominal Bit Rate with Tolerance STM-64 Opt Int	ITU-T G.707 Annex-K
2.11.4	Operating Wavelength Range for STM-64 Opt Int	ITU-T G.691. Annex-K
2.11.5	Output Jitter for STM-64 Opt Int	ITU-T G.783. Annex-K
2.11.6	Receiver Overload for STM-64 Opt Int	ITU-T G.691. Annex-K
2.11.7	Receiver Sensitivity for STM-64 Opt Int	ITU-T G.691. Annex-K

3. Variant 3 : Satellite Baseband Modem

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 22/32 EN55022/32. Annex-B
3.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
3.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
3.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
3.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
3.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
3.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
3.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
3.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

3.2 Interface 1 : 1 G Optical Ethernet

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

3.3 Interface 2 : 10 G Optical Ethernet

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

3.4 Interface 3 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
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3.4.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.4.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
3.4.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
3.4.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.4.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

3.5 Interface 4 : Fast Ethernet Electrical

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

3.6 Interface 5 : Gigabit Ethernet Electrical

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

3.7 Interface 6 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
3.7.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
3.7.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
3.7.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
3.7.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K
3.7.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K

3.8 Interface 7 : STM-1 Optical

S.No.	Parameter Name	Standard Name
3.8.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
3.8.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
3.8.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
3.8.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
3.8.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 G.825 Annex-K

3.8.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
3.8.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

3.9 Interface 8 : STM-16 Optical

S.No.	Parameter Name	Standard Name
3.9.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
3.9.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
3.9.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
3.9.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
3.9.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
3.9.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
3.9.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

3.10 Interface 9 : STM-4 Optical

S.No.	Parameter Name	Standard Name
3.10.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
3.10.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
3.10.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
3.10.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
3.10.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
3.10.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
3.10.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

3.11 Interface 10 : STM-64 Optical

S.No.	Parameter Name	Standard Name
3.11.1	Input Jitter Tolerance for STM-64 Opt	ITU-T G.825. Annex-K
3.11.2	Mean Launched Power for STM-64 Opt Int	ITU-T G.691. Annex-K
3.11.3	Nominal Bit Rate with Tolerance STM-64 Opt Int	ITU-T G.707 Annex-K

3.11.4	Operating Wavelength Range for STM-64 Opt Int	ITU-T G.691. Annex-K
3.11.5	Output Jitter for STM-64 Opt Int	ITU-T G.783. Annex-K
3.11.6	Receiver Overload for STM-64 Opt Int	ITU-T G.691. Annex-K
3.11.7	Receiver Sensitivity for STM-64 Opt Int	ITU-T G.691. Annex-K

4. Variant 4 : Satellite Baseband Modem Controller

4.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
4.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
4.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
4.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
4.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
4.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
4.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
4.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
4.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
4.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

5. Variant 5 : Satellite BUC

5.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
5.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B

5.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
5.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
5.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
5.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
5.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
5.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
5.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
5.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

6. Variant 6 : Satellite IF Transreceiver

6.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
6.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
6.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
6.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
6.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
6.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
6.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
6.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B

6.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
6.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

7. Variant 7 : Satellite LNA

7.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
7.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
7.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
7.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
7.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
7.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
7.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
7.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
7.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
7.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

8. Variant 8 : Satellite LNB

8.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
8.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
8.1.2	Immunity to AC Voltage Dips and Short	TEC EMI EMC Standard EN/IEC:61000-4-

	Interruptions	11. Annex-B
8.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
8.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
8.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
8.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
8.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
8.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
8.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

9. Variant 9 : Satellite Optimisation Equipment

9.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
9.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
9.1.2	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
9.1.3	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
9.1.4	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
9.1.5	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
9.1.6	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
9.1.7	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
9.1.8	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5.

		Annex-B
9.1.9	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

10. Variant 10 : Satellite Radio Frequency Transceiver

10.101 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
10.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
10.1.2	Frequency of Operation - Satellite Equipment	NFAP. Annex-C1
10.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
10.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
10.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
10.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
10.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
10.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
10.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
10.1.10	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
10.1.11	IT Equipment Safety for Radio Products	EN/IEC 60215:2016. Annex-A3
10.1.12	Transmit Power - Satellite Equipment	As per DoT/WPC license conditions. Annex-C2

11. Variant 11 : VSAT Terminals

11.1 Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
11.1.1	Conducted And Radiated Emission - Class A	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
11.1.2	Conformance to standards for Satellite	ETSI EN 301 443 ETSI EN 301 428. Annex-C3
11.1.3	Frequency of Operation - Satellite Equipment	NFAP. Annex-C1
11.1.4	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
11.1.5	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
11.1.6	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
11.1.7	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
11.1.8	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
11.1.9	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
11.1.10	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
11.1.11	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
11.1.12	IT Equipment Safety for Radio Products	EN/IEC 60215:2016. Annex-A3
11.1.13	Transmit Power - Satellite Equipment	As per DoT/WPC license conditions. Annex-C2

11.2 Interface 1 : 1 G Optical Ethernet

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

11.3 Interface 2 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
11.3.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
11.3.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
11.3.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
11.3.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
11.3.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

11.4 Interface 3 : Fast Ethernet Electrical

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

11.5 Interface 4 : Gigabit Ethernet Electrical

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