अनिवार्य आवश्यकताएँ

संख्या : TEC37942203

Essential Requirements

ER No. : TEC37942203

LAN Switch

MTCTE के तहत जारी:

Issued under MTCTE by:

दूरसंचार अभियांत्रिकी केंद्र

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Government of India

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Essential Requirements for:

LAN Switch

Certification Scheme: **GCS** Product Fee Group: **C**

This ER covers all types of LAN Switches

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. L2 LAN Switch
2. L3 LAN Switch
3. MPLS TP CEN Switch

1. Variant 1 : L2 LAN Switch

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	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	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
1.1.11	Mac Learning and Packet Forwarding	Annex-P11
1.1.12	Manageability SNMP V2 or V3	RFC 3410 3416 Annex-P11
1.1.13	Spanning Tree Protocol	IEEE 802.1d. Annex-P11

1.2 Interface 1 : 1 G Optical Ethernet

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

1.3 Interface 2 : 10 100 1000 BASE-T Ethernet

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

1.4 Interface 3 : 10 100 BASE-T Ethernet

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

1.5 Interface 4 : 10 G Optical Ethernet

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

1.6 Interface 5 : 100 G Optical Ethernet

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

1.7 Interface 6 : 200 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
1.7.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.7.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.7.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

1.8 Interface 7 : 40 G Optical Ethernet

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

1.9 Interface 8 : 400 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
1.9.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.9.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.9.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

1.10 Interface 9 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
1.10.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
1.10.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
1.10.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

2. Variant 2 : L3 LAN Switch

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	Conducted And Radiated Emission - Class B	TEC EMI EMC Standard CISPR 22/32 EN55022/32. Annex-B
2.1.3	Dynamic Routing	Annex-P11
2.1.4	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
2.1.5	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
2.1.6	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
2.1.7	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
2.1.8	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
2.1.9	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
2.1.10	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
2.1.11	IPV4 Parameters Set-D	RFC 791. Annex-P11
2.1.12	IPV6 as per RFC 2460 or 8200	RFC 2460 or 8200. Annex-P11
2.1.13	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
2.1.14	Mac Learning and Packet Forwarding	Annex-P11
2.1.15	Manageability SNMP V2 or V3	RFC 3410 3416 Annex-P11
2.1.16	Spanning Tree Protocol	IEEE 802.1d. Annex-P11
2.1.17	Static Routing	Annex-P11

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 : 10 100 1000 BASE-T Ethernet

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

2.4 Interface 3 : 10 100 BASE-T Ethernet

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

2.5 Interface 4 : 10 G Optical Ethernet

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

2.6 Interface 5 : 100 G Optical Ethernet

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

2.7 Interface 6 : 200 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
2.7.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
2.7.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
2.7.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

2.8 Interface 7 : 40 G Optical Ethernet

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

2.8.2	Receiver Sensitivity 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H
2.8.3	Wavelength for 40 GE Opt	IEEE 802.3ba Cl. 86 87. Annex-H

2.9 Interface 8 : 400 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
2.9.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
2.9.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
2.9.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

2.10 Interface 9 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
2.10.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
2.10.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
2.10.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

3. Variant 3 : MPLS TP CEN Switch

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	Ethernet PWE and Service Identification	RFC 4448 Clause 4. Annex-P11
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	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
3.1.11	Mac Learning and Packet Forwarding	Annex-P11
3.1.12	Manageability SNMP V2 or V3 or Qx Management Protocol	RFC 3410 3416 Annex-P11
3.1.13	MPLS TP Requirement	RFC 5654 Clause 2. Annex-P11
3.1.14	TDM PWE and Service Identification	RFC 3916 Clause 4 & Clause 7.1 Annex-P11

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 : 10 100 1000 BASE-T Ethernet

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

3.4 Interface 3 : 10 100 BASE-T Ethernet

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

3.5 Interface 4 : 10 G Optical Ethernet

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

3.6 Interface 5 : 100 G Optical Ethernet

S.No.	Parameter Name	Standard Name

3.6.1	Average Launch power for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
3.6.2	Receiver Sensitivity 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H
3.6.3	Wavelength for 100 GE Opt	IEEE 802.3ba Cl. 86 88. Annex-H

3.7 Interface 6 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
3.7.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.7.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
3.7.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
3.7.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.7.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

3.8 Interface 7 : 200 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
3.8.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
3.8.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
3.8.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

3.9 Interface 8 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
3.9.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
3.9.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
3.9.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
3.9.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
3.9.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

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 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 : 400 G BASE-X Ethernet

S.No.	Parameter Name	Standard Name
3.11.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
3.11.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
3.11.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

3.12 Interface 11 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
3.12.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
3.12.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
3.12.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
3.12.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
3.12.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

3.13 Interface 12 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
3.13.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
3.13.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
3.13.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

3.14 Interface 13 : STM-1 Optical

S.No.	Parameter Name	Standard Name
3.14.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
3.14.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
3.14.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
3.14.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
3.14.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 G.825 Annex-K
3.14.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K

3.14.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

3.15 Interface 14 : STM-16 Optical

S.No.	Parameter Name	Standard Name
3.15.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
3.15.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
3.15.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
3.15.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
3.15.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
3.15.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
3.15.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

3.16 Interface 15 : STM-4 Optical

S.No.	Parameter Name	Standard Name
3.16.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
3.16.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
3.16.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
3.16.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
3.16.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
3.16.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
3.16.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K