अनिवार्य आवश्कताएँ संख्या : TEC37942410

Essential Requirements ER No. : TEC37942410

LAN Switch

MTCTE के तहत जारी:
Issued under MTCTE by:

दूरसंचार अभियांत्रिकी केंद्र
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Essential Requirements for:

LAN Switch

Certification Scheme: **SCS** 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. Fabric Interconnect Switch
2. L2 LAN Switch
3. L2 Unmanaged Switch
4. L3 LAN Switch
5. MPLS TP Switch
6. Storage Area Network (SAN) Switch

1. Variant 1 : Fabric Interconnect Switch

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 applicability as defined in Notes to Annex-B.
1.1.2	Fibre Channel Dynamic Routing	RFC 4626 Annex-P11
1.1.3		

1.1.4	Fibre Channel Name Server	RFC 4438 Annex-P11
1.1.5	Fibre Channel Registered State Change Notification	RFC 4983 Annex-P11
1.1.6		
1.1.7	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
1.1.8	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
1.1.9	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
1.1.10	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
1.1.11	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
1.1.12	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
1.1.13	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
1.1.14	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
1.1.15	Manageability SNMP V2 or V3/Netconf/Yang	RFC 3410 or RFC 3416 or RFC 6241 or RFC 6020 Test No. 38 or 39 or 68 Annex-P11

Note: The Equipment can have one or more interfaces from the following list

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

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

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

5. Interface 4 : 10G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.5.1	Average Launch Power for 10GFC	IEEE Std 802.3-2022, Cl. 52
1.5.2	Data Rate for 10GFC	IEEE Std 802.3-2022, Cl. 52
1.5.3	Receiver Sensitivity for 10GFC	IEEE Std 802.3-2022, Cl. 52
1.5.4	Wavelength for 10GFC	IEEE Std 802.3-2022, Cl. 52

6. Interface 5 : 10 G Optical Ethernet

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

7. Interface 6 : 128G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.7.1	Average Launch Power for 128GFC	FC-PI-8, INCITS 560-2023
1.7.2	Data Rate for 128GFC	FC-PI-8, INCITS 560-2023
1.7.3	Receiver Sensitivity for 128GFC	FC-PI-8, INCITS 560-2023
1.7.4	Wavelength for 128GFC	FC-PI-8, INCITS 560-2023

8. Interface 7 : 16G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.8.1	Average Launch Power for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
1.8.2	Data Rate for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
1.8.3	Receiver Sensitivity for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)

1.8.4	Wavelength for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)

9. Interface 8 : 1G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.9.1	Average Launch Power for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)
1.9.2	Data Rate for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)
1.9.3	Receiver Sensitivity for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)
1.9.4	Wavelength for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)

10. Interface 9 : 1 G Optical Ethernet

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

11. Interface 10 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.11.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.11.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.11.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

12. Interface 11 : 256G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.12.1	Average Launch Power for 256GFC	FC-PI-9, INCITS 581-202x
1.12.2	Data Rate for 256GFC	FC-PI-9, INCITS 581-202x
1.12.3	Receiver Sensitivity for 256GFC	FC-PI-9, INCITS 581-202x
1.12.4	Wavelength for 256GFC	FC-PI-9, INCITS 581-202x

13. Interface 12 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.13.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

1.13.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
1.13.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

14. Interface 13 : 2G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.14.1	Average Launch Power for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
1.14.2	Data Rate for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
1.14.3	Receiver Sensitivity for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
1.14.4	Wavelength for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)

15. Interface 14 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
1.15.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.15.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
1.15.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
1.15.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.15.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

16. Interface 15 : 32G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.16.1	Average Launch Power for 32GFC	FC-PI-6 (INCITS 512-2015)
1.16.2	Data Rate for 32GFC	FC-PI-6 (INCITS 512-2015)
1.16.3	Receiver Sensitivity for 32GFC	FC-PI-6 (INCITS 512-2015)
1.16.4	Wavelength for 32GFC	FC-PI-6 (INCITS 512-2015)

17. Interface 16 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
1.17.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I

1.17.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
1.17.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
1.17.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
1.17.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.18.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.18.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.18.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

19. Interface 18 : 40 G Optical Ethernet

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

20. Interface 19 : 4G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.20.1	Average Launch Power for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
1.20.2	Data Rate for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
1.20.3	Receiver Sensitivity for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
1.20.4	Wavelength for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)

21. Interface 20 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
1.21.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
1.21.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn

1.21.3	Wavelength for 50 GE Opt	IEEE 802.3cn

22. Interface 21 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
1.22.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
1.22.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

23. Interface 22 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
1.23.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
1.23.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

24. Interface 23 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name
1.24.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15
1.24.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

25. Interface 24 : 64G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.25.1	Average Launch Power for 64GFC	FC-PI-7 (INCITS 543-2019)
1.25.2	Data Rate for 64GFC	FC-PI-7 (INCITS 543-2019)
1.25.3	Receiver Sensitivity for 64GFC	FC-PI-7 (INCITS 543-2019)
1.25.4	Wavelength for 64GFC	FC-PI-7 (INCITS 543-2019)

26. Interface 25 : 8G FC Fibre Channel

S.No.	Parameter Name	Standard Name
1.26.1	Average Launch Power for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
1.26.2	Data Rate for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
1.26.3	Receiver Sensitivity for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-

		2008)
1.26.4	Wavelength for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)

27. Interface 26 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
1.27.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
1.27.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
1.27.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
1.27.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
1.27.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

28. Interface 27 : CDMA

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

29. Interface 28 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
1.29.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
1.29.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
1.29.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

30. Interface 29 : GSM or GPRS or EDGE

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

31. Interface 30 : LTE or LTE-A

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

32. Interface 31 : STM-16 Optical

S.No.	Parameter Name	Standard Name
1.32.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
1.32.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
1.32.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
1.32.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
1.32.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
1.32.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
1.32.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

33. Interface 32 : STM-1 Optical

S.No.	Parameter Name	Standard Name
1.33.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
1.33.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
1.33.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
1.33.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
1.33.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
1.33.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
1.33.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

34. Interface 33 : STM-4 Optical

S.No.	Parameter Name	Standard Name
1.34.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
1.34.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K

1.34.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
1.34.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
1.34.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
1.34.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
1.34.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

35. Interface 34 : WCDMA or HSPA

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

2. Variant 2 : L2 LAN Switch

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	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
2.1.10	Mac Learning and Packet Forwarding	Annex-P11
2.1.11	Manageability SNMP V2 or V3/Netconf/Yang	RFC 3410 or RFC 3416 or RFC 6241 or RFC 6020 Test No. 38 or 39 or 68 Annex-P11
2.1.12	Spanning Tree Protocol	IEEE 802.1d. Annex-P11

Note: The Equipment can have one or more interfaces from the following list

2. Interface 1 : 100 G Optical Ethernet

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

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

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

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

6. Interface 5 : 1 G Optical Ethernet

S.No.	Parameter Name	Standard Name

2.6.1	Average Launch power for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.6.2	Receiver Sensitivity 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
2.6.3	Wavelength for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H

7. Interface 6 : 200 G Optical 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

8. Interface 7 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.8.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
2.8.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
2.8.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

9. Interface 8 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
2.9.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.9.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
2.9.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
2.9.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.9.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

10. Interface 9 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
2.10.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
2.10.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
2.10.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
2.10.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
2.10.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

11. Interface 10 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.11.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
2.11.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
2.11.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

12. Interface 11 : 40 G Optical Ethernet

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

13. Interface 12 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
2.13.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
2.13.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
2.13.3	Wavelength for 50 GE Opt	IEEE 802.3cn

14. Interface 13 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
2.14.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
2.14.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

15. Interface 14 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
2.15.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
2.15.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

16. Interface 15 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name

2.16.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15
2.16.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

17. Interface 16 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
2.17.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
2.17.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
2.17.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
2.17.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
2.17.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : CDMA

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

19. Interface 18 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
2.19.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
2.19.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
2.19.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

20. Interface 19 : GSM or GPRS or EDGE

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

21. Interface 20 : LTE or LTE-A

S.No.	Parameter Name	Standard Name

2.21.1	Int Parameters for LTE or LTE-A	3GPP TS 36.521-1 or EN 301 908-13. Annex-F12
2.21.2	Operating Frequency for LTE or LTE-A Int	NFAP. Annex-F

22. Interface 21 : STM-16 Optical

S.No.	Parameter Name	Standard Name
2.22.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
2.22.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
2.22.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
2.22.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
2.22.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
2.22.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
2.22.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

23. Interface 22 : STM-1 Optical

S.No.	Parameter Name	Standard Name
2.23.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
2.23.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
2.23.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
2.23.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
2.23.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
2.23.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
2.23.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

24. Interface 23 : STM-4 Optical

S.No.	Parameter Name	Standard Name
2.24.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
2.24.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
2.24.3	Nominal Bit Rate with Tolerance STM-4 Opt	ITU-T G.957 Annex-K

	Int	
2.24.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
2.24.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
2.24.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
2.24.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

25. Interface 24 : WCDMA or HSPA

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

3. Variant 3 : L2 Unmanaged Switch

1. Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
3.1.1	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.
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
3.1.10	Mac Learning and Packet Forwarding	Annex-P11

Note: The Equipment can have one or more interfaces from the following list

2. Interface 1 : 100 G Optical Ethernet

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

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

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

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

6. Interface 5 : 1 G Optical Ethernet

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

7. Interface 6 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
3.7.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
3.7.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
3.7.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

8. Interface 7 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
3.8.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
3.8.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
3.8.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

9. Interface 8 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
3.9.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.9.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
3.9.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
3.9.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
3.9.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

10. Interface 9 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
3.10.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
3.10.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
3.10.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
3.10.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
3.10.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

11. Interface 10 : 400 G Optical 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

12. Interface 11 : 40 G Optical Ethernet

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

13. Interface 12 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
3.13.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
3.13.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
3.13.3	Wavelength for 50 GE Opt	IEEE 802.3cn

14. Interface 13 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
3.14.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
3.14.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

15. Interface 14 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
3.15.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
3.15.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

16. Interface 15 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name
3.16.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15
3.16.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

17. Interface 16 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
3.17.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
3.17.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
3.17.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
3.17.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
3.17.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : CDMA

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

19. Interface 18 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
3.19.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
3.19.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
3.19.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

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

21. Interface 20 : 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

22. Interface 21 : STM-16 Optical

S.No.	Parameter Name	Standard Name
3.22.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
3.22.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
3.22.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
3.22.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
3.22.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
3.22.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
3.22.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

23. Interface 22 : STM-1 Optical

S.No.	Parameter Name	Standard Name
3.23.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
3.23.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
3.23.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
3.23.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
3.23.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
3.23.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
3.23.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

24. Interface 23 : STM-4 Optical

S.No.	Parameter Name	Standard Name
3.24.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
3.24.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
3.24.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
3.24.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
3.24.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
3.24.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K

3.24.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

25. Interface 24 : WCDMA or HSPA

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

4. Variant 4 : L3 LAN Switch

1. Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
4.1.1	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.
4.1.2	Dynamic Routing	Annex-P11
4.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
4.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
4.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
4.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
4.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
4.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
4.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
4.1.10	IPV4 Parameters Set-D	RFC 791. Annex-P11
4.1.11	IPV6 as per RFC 8200	RFC 8200. Annex-P11
4.1.12	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1

4.1.13	Mac Learning and Packet Forwarding	Annex-P11
4.1.14	Manageability SNMP V2 or V3/Netconf/Yang	RFC 3410 or RFC 3416 or RFC 6241 or RFC 6020 Test No. 38 or 39 or 68 Annex-P11
4.1.15	Spanning Tree Protocol	IEEE 802.1d. Annex-P11
4.1.16	Static Routing	Annex-P11

Note: The Equipment can have one or more interfaces from the following list

2. Interface 1 : 100 G Optical Ethernet

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

3. Interface 2 : 10 100 1000 BASE-T Ethernet

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

4. Interface 3 : 10 100 BASE-T Ethernet

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

5. Interface 4 : 10 G Optical Ethernet

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

6. Interface 5 : 1 G Optical Ethernet

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

7. Interface 6 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
4.7.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
4.7.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
4.7.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

8. Interface 7 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
4.8.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
4.8.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
4.8.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

9. Interface 8 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
4.9.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
4.9.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
4.9.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
4.9.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
4.9.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

10. Interface 9 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
4.10.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
4.10.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
4.10.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
4.10.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
4.10.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

11. Interface 10 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
4.11.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
4.11.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
4.11.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

12. Interface 11 : 40 G Optical Ethernet

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

13. Interface 12 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
4.13.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
4.13.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
4.13.3	Wavelength for 50 GE Opt	IEEE 802.3cn

14. Interface 13 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
4.14.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
4.14.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

15. Interface 14 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
4.15.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
4.15.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

16. Interface 15 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name
4.16.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15

4.16.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

17. Interface 16 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
4.17.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
4.17.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
4.17.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
4.17.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
4.17.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : CDMA

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

19. Interface 18 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
4.19.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
4.19.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
4.19.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

20. Interface 19 : GSM or GPRS or EDGE

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

21. Interface 20 : LTE or LTE-A

S.No.	Parameter Name	Standard Name
4.21.1	Int Parameters for LTE or LTE-A	3GPP TS 36.521-1 or EN 301 908-13.

		Annex-F12
4.21.2	Operating Frequency for LTE or LTE-A Int	NFAP. Annex-F

22. Interface 21 : STM-16 Optical

S.No.	Parameter Name	Standard Name
4.22.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
4.22.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
4.22.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
4.22.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
4.22.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
4.22.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
4.22.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

23. Interface 22 : STM-1 Optical

S.No.	Parameter Name	Standard Name
4.23.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
4.23.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
4.23.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
4.23.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
4.23.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
4.23.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
4.23.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

24. Interface 23 : STM-4 Optical

S.No.	Parameter Name	Standard Name
4.24.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
4.24.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
4.24.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K

4.24.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
4.24.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
4.24.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
4.24.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

25. Interface 24 : WCDMA or HSPA

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

5. Variant 5 : MPLS TP Switch

1. 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 32 EN550 32. Annex-B
5.1.2	Ethernet PWE and Service Identification	RFC 4448 Clause 4. Annex-P11
5.1.3	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
5.1.4	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
5.1.5	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
5.1.6	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
5.1.7	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
5.1.8	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
5.1.9	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B

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

Note: The Equipment can have one or more interfaces from the following list

2. Interface 1 : 100 G Optical Ethernet

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

3. Interface 2 : 10 100 1000 BASE-T Ethernet

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

4. Interface 3 : 10 100 BASE-T Ethernet

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

5. Interface 4 : 10 G Optical Ethernet

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

6. Interface 5 : 1 G Optical Ethernet

S.No.	Parameter Name	Standard Name
5.6.1	Average Launch power for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H

5.6.2	Receiver Sensitivity 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H
5.6.3	Wavelength for 1 GE Opt	IEEE 802.3z Cl. 38. Annex-H

7. Interface 6 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
5.7.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
5.7.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
5.7.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

8. Interface 7 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
5.8.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
5.8.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
5.8.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

9. Interface 8 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
5.9.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
5.9.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
5.9.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
5.9.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
5.9.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

10. Interface 9 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
5.10.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
5.10.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
5.10.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
5.10.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
5.10.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

11. Interface 10 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
5.11.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
5.11.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
5.11.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

12. Interface 11 : 40 G Optical Ethernet

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

13. Interface 12 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
5.13.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
5.13.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
5.13.3	Wavelength for 50 GE Opt	IEEE 802.3cn

14. Interface 13 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
5.14.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
5.14.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

15. Interface 14 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
5.15.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
5.15.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

16. Interface 15 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name

5.16.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15
5.16.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

17. Interface 16 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name
5.17.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
5.17.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
5.17.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
5.17.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
5.17.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : CDMA

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

19. Interface 18 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
5.19.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
5.19.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
5.19.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

20. Interface 19 : GSM or GPRS or EDGE

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

21. Interface 20 : LTE or LTE-A

S.No.	Parameter Name	Standard Name

5.21.1	Int Parameters for LTE or LTE-A	3GPP TS 36.521-1 or EN 301 908-13. Annex-F12
5.21.2	Operating Frequency for LTE or LTE-A Int	NFAP. Annex-F

22. Interface 21 : STM-16 Optical

S.No.	Parameter Name	Standard Name
5.22.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
5.22.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
5.22.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
5.22.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
5.22.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
5.22.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
5.22.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

23. Interface 22 : STM-1 Optical

S.No.	Parameter Name	Standard Name
5.23.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
5.23.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
5.23.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
5.23.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
5.23.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
5.23.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
5.23.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

24. Interface 23 : STM-4 Optical

S.No.	Parameter Name	Standard Name
5.24.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
5.24.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
5.24.3	Nominal Bit Rate with Tolerance STM-4 Opt	ITU-T G.957 Annex-K

	Int	
5.24.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
5.24.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
5.24.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
5.24.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

25. Interface 24 : WCDMA or HSPA

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

6. Variant 6 : Storage Area Network (SAN) Switch

1. Parameters Linked with Product Variant

S.No.	Parameter Name	Standard Name
6.1.1	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.
6.1.2	Fibre Channel Dynamic Routing	RFC 4626 Annex-P11
6.1.3	Fibre Channel Frame Encapsulation	RFC 3643 or RFC 4388 Annex-P11
6.1.4	Fibre Channel Logins	RFC 4172 Annex-P11
6.1.5	Fibre Channell Zone Server	RFC 4936 Annex-P11
6.1.6		
6.1.7	Fibre Channel Name Server	RFC 4438 Annex-P11
6.1.8	Fibre Channel Packet Forwarding	RFC 2625 Annex-P11
6.1.9	Fibre Channel Registered State Change Notification	RFC 4983 Annex-P11
6.1.10	Fibre Channel Security Protocols (FC-SP)	Functional Test/ RFC 5324 Annex-P11
6.1.11		
6.1.12	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B

6.1.13	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B
6.1.14	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
6.1.15	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
6.1.16	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
6.1.17	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
6.1.18	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5. Annex-B
6.1.19	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
6.1.20	Manageability SNMP V2 or V3/Netconf/Yang	RFC 3410 or RFC 3416 or RFC 6241 or RFC 6020 Test No. 38 or 39 or 68 Annex-P11

Note: The Equipment can have one or more interfaces from the following list

2. Interface 1 : 100 G Optical Ethernet

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

3. Interface 2 : 10 100 1000 BASE-T Ethernet

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

4. Interface 3 : 10 100 BASE-T Ethernet

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

5. Interface 4 : 10G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.5.1	Average Launch Power for 10GFC	IEEE Std 802.3-2022, Cl. 52
6.5.2	Data Rate for 10GFC	IEEE Std 802.3-2022, Cl. 52
6.5.3	Receiver Sensitivity for 10GFC	IEEE Std 802.3-2022, Cl. 52
6.5.4	Wavelength for 10GFC	IEEE Std 802.3-2022, Cl. 52

6. Interface 5 : 10 G Optical Ethernet

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

7. Interface 6 : 128G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.7.1	Average Launch Power for 128GFC	FC-PI-8, INCITS 560-2023
6.7.2	Data Rate for 128GFC	FC-PI-8, INCITS 560-2023
6.7.3	Receiver Sensitivity for 128GFC	FC-PI-8, INCITS 560-2023
6.7.4	Wavelength for 128GFC	FC-PI-8, INCITS 560-2023

8. Interface 7 : 16G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.8.1	Average Launch Power for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
6.8.2	Data Rate for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
6.8.3	Receiver Sensitivity for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
6.8.4	Wavelength for 16GFC	FC-PI-5, Revision 6 (ANSI INCITS 479-2011)

9. Interface 8 : 1G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.9.1	Average Launch Power for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)

6.9.2	Data Rate for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)
6.9.3	Receiver Sensitivity for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)
6.9.4	Wavelength for 1GFC	FC-PI, Revision 13 (ANSI INCITS 352-2002)

10. Interface 9 : 1 G Optical Ethernet

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

11. Interface 10 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
6.11.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
6.11.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
6.11.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

12. Interface 11 : 256G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.12.1	Average Launch Power for 256GFC	FC-PI-9, INCITS 581-202x
6.12.2	Data Rate for 256GFC	FC-PI-9, INCITS 581-202x
6.12.3	Receiver Sensitivity for 256GFC	FC-PI-9, INCITS 581-202x
6.12.4	Wavelength for 256GFC	FC-PI-9, INCITS 581-202x

13. Interface 12 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
6.13.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
6.13.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
6.13.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

14. Interface 13 : 2G FC Fibre Channel

S.No.	Parameter Name	Standard Name

6.14.1	Average Launch Power for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
6.14.2	Data Rate for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
6.14.3	Receiver Sensitivity for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
6.14.4	Wavelength for 2GFC	FC-PI-2, Revision 10 (ANSI INCITS 404-2006)

15. Interface 14 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
6.15.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
6.15.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
6.15.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
6.15.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
6.15.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

16. Interface 15 : 32G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.16.1	Average Launch Power for 32GFC	FC-PI-6 (INCITS 512-2015)
6.16.2	Data Rate for 32GFC	FC-PI-6 (INCITS 512-2015)
6.16.3	Receiver Sensitivity for 32GFC	FC-PI-6 (INCITS 512-2015)
6.16.4	Wavelength for 32GFC	FC-PI-6 (INCITS 512-2015)

17. Interface 16 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
6.17.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
6.17.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
6.17.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
6.17.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
6.17.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

18. Interface 17 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
6.18.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
6.18.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
6.18.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

19. Interface 18 : 40 G Optical Ethernet

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

20. Interface 19 : 4G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.20.1	Average Launch Power for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
6.20.2	Data Rate for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
6.20.3	Receiver Sensitivity for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
6.20.4	Wavelength for 4GFC	FC-PI-3, Revision 4 (ANSI INCITS 460-2011)

21. Interface 20 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
6.21.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
6.21.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
6.21.3	Wavelength for 50 GE Opt	IEEE 802.3cn

22. Interface 21 : 5G NR (FR1)

S.No.	Parameter Name	Standard Name
6.22.1	Int Parameters for 5G NR (FR1)	3GPP TS 38.521-1. Annex-F14
6.22.2	Operating frequency for 5G NR (FR1)	NFAP. Annex-F

23. Interface 22 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
6.23.1	Int Parameters for 5G NR-FR1 and FR2 interworking with other Radios	3GPP TS 38.521-3. Annex-F13
6.23.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

24. Interface 23 : 5G NR (FR2)

S.No.	Parameter Name	Standard Name
6.24.1	Int Parameters for 5G NR (FR2)	3GPP TS 38.521-2. Annex-F15
6.24.2	Operating frequency for 5G NR (FR2)	NFAP. Annex-F

25. Interface 24 : 64G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.25.1	Average Launch Power for 64GFC	FC-PI-7 (INCITS 543-2019)
6.25.2	Data Rate for 64GFC	FC-PI-7 (INCITS 543-2019)
6.25.3	Receiver Sensitivity for 64GFC	FC-PI-7 (INCITS 543-2019)
6.25.4	Wavelength for 64GFC	FC-PI-7 (INCITS 543-2019)

26. Interface 25 : 8G FC Fibre Channel

S.No.	Parameter Name	Standard Name
6.26.1	Average Launch Power for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
6.26.2	Data Rate for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
6.26.3	Receiver Sensitivity for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
6.26.4	Wavelength for 8GFC	FC-PI-4, Revision 8 (ANSI INCITS 450-2008)

27. Interface 26 : 8 Mbps - E2

S.No.	Parameter Name	Standard Name

6.27.1	Input Jitter Tolerance for 8 Mbps Int	ITU-T G.823. Annex-I
6.27.2	Input Return Loss for 8 Mbps Int	ITU-T G.703. Annex-I
6.27.3	Nominal Bit Rate with Tolerance for 8 Mbps Int	ITU-T G.703 Annex-I
6.27.4	Output Jitter for 8 Mbps Int	ITU-T G.823. Annex-I
6.27.5	Pulse Mask for 8 Mbps Int	ITU-T G.703. Annex-I

28. Interface 27 : CDMA

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

29. Interface 28 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
6.29.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
6.29.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
6.29.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

30. Interface 29 : GSM or GPRS or EDGE

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

31. Interface 30 : LTE or LTE-A

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

32. Interface 31 : STM-16 Optical

S.No.	Parameter Name	Standard Name
6.32.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
6.32.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
6.32.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
6.32.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
6.32.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
6.32.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
6.32.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

33. Interface 32 : STM-1 Optical

S.No.	Parameter Name	Standard Name
6.33.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
6.33.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
6.33.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
6.33.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
6.33.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
6.33.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
6.33.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

34. Interface 33 : STM-4 Optical

S.No.	Parameter Name	Standard Name
6.34.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
6.34.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
6.34.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
6.34.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
6.34.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
6.34.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K

6.34.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

35. Interface 34 : WCDMA or HSPA

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

Revised Test No. 84 Fibre Channel Security Protocols (FC-SP)

Test Procedure:

1. Mutual Authentication Test~~(DHCHAP)~~:

1. Initiate a Fibre Channel login (PLOGI) from Host A to the SAN switch
2. Configure Host A and SAN Switch with DHCHAP or any equivalent Protocol

2.Integrity Check Test:

1. Send Fibre Channel frames with known data from Host A to Target Device A through the SAN switch.

Expected Results:

1. Mutual Authentication Test~~(DHCHAP~~):

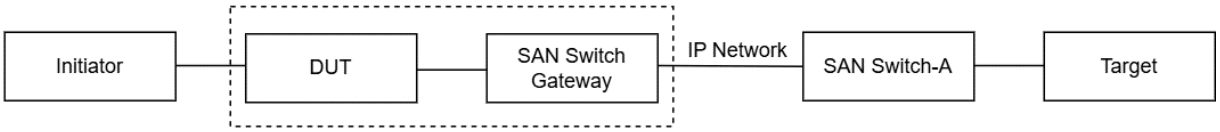
1. SAN switch performs mutual authentication with Host A using FC-SP.
2. Verify in the SAN switch logs that Host A and the switch mutually authenticate each other successfully.

2.Integrity Check Test:

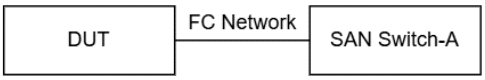
1. SAN switch performs integrity checking on the received frames using FC-SP.
2. Capture the frames using a protocol analyzer and verify that the integrity of the frames is maintained (CRC Validated)

Revised Test No. 79 Fibre Channel Frame Encapsulation

FCIP Topology



IPFC Topology



Test Procedure:
RFC No. 3643
1. FC over IP (FCIP):
1. Ensure that the DUT/SAN Switch gateway and SAN Switch-A are configured with FCIP on the IP interfaces.
2. Initiate an FC ping to verify the connectivity between the Initiator and the Target.
3. Ensure that DUT is capable of sending and receiving Fibre Channel Packets over an IP network.
(or)
RFC No. 4338
2. IP over FC (IPFC):
1. Ensure that the DUT and the SAN Switch-A are configured with IPFC on the FC interfaces.
2. Initiate an ICMP ping to verify the connectivity between the DUT and the SAN Switch-A.
3. Ensure that the DUT is capable of sending and receiving IP Packets over the FC network.

Expected Results:
1. FC over IP (FCIP):
1. Ping should succeed with no packet loss.
2. Verify that the captured logs contain FC packets that the DUT properly encapsulates and forwards over the IP network.
(or)
2. IP over FC (IPFC):
1. Ping should succeed with no packet loss.
2. Verify that the captured logs contain IPv4 packets that the DUT properly encapsulates and forwards over the FC network.

Comments on Revision of ER of LAN Switch

(Draft ER No. TEC37942410)

Name of Manufacturer/Stakeholder:

Organization:

Contact Details:

Clause No.	Clause	Comments	Justification

Note: The comments on the revision of ER of LAN Switch may be provided in the above format vide Email to adic1.tec@gov.in , adit2.tec-dot@gov.in, diri.tec@nic.in