अनिवार्य आवश्यकताएँ

संख्या : TEC30082605

Essential Requirements

ER No. : TEC30082605

CGNAT Equipment

MTCTE के तहत जारी:

Issued under MTCTE by:

दूरसंचार अभियांत्रिकी केंद्र

भारत सरकार

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Telecommunication Engineering Centre

Government of India

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

Essential Requirements for:

CGNAT Equipment

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

This ER covers all types of Carrier Grade Network Address Translation (CGNAT) Equipment. Any network device that performs ..... (Refer Annexure to ER, Appendix V for further details regarding definition, interface and scope of testing)

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. Carrier Grade NAT Equipment

1. Variant 1 : Carrier Grade NAT Equipment

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 32 EN550

		32. Annex-B
1.1.2	Deterministic NAT	Appendix-II, Test No.124
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	IPV4 Parameters Set-D	RFC 791. Annex-P11
1.1.11	IPV6	RFC 8200 4861 4862 8201 4443 Annex-P11
1.1.12	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
1.1.13	Manageability SNMPV2 or 3	RFC 3416 or RFC 3410. Appendix-II Test No. 38 or 39
1.1.14	NAT44 Functionality	Appendix-II, Test No.123
1.1.15	NAT Functional Test	Annex-P11
1.1.16	Port Block Allocation	Appendix-II, Test No.125

1.2 Interface 1 : 100 G Optical Ethernet

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

1.3 Interface 2 : 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 BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.5.1	Link Speed and Auto negotiation Test 10 GE	IEEE 802.3an. Annex-H

1.6 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

1.7 Interface 6 : 1 G Optical Ethernet

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

1.8 Interface 7 : 200 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.8.1	Average Launch Power for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.8.2	Receiver Sensitivity for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122
1.8.3	Wavelength for 200 GE Opt	IEEE 802.3cn Cl 121 Cl 122

1.9 Interface 8 : 2.5 G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.9.1	Link Speed and Auto negotiation Test 2.5 GE	IEEE 802.3bz. Annex-H

1.10 Interface 9 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.10.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
1.10.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
1.10.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

1.11 Interface 10 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
1.11.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.11.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
1.11.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
1.11.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
1.11.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

1.12 Interface 11 : 34 Mbps - E3

S.No.	Parameter Name	Standard Name
1.12.1	Input Jitter Tolerance for 34 Mbps Int	ITU-T G.823. Annex-I
1.12.2	Input Return Loss for 34 Mbps Int	ITU-T G.703. Annex-I
1.12.3	Nominal Bit Rate with Tolerance for 34 Mbps Int	ITU-T G.703 Annex-I
1.12.4	Output Jitter for 34 Mbps Int	ITU-T G.823. Annex-I
1.12.5	Pulse Mask for 34 Mbps Int	ITU-T G.703. Annex-I

1.13 Interface 12 : 400 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.13.1	Average Launch Power for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.13.2	Receiver Sensitivity for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124
1.13.3	Wavelength for 400 GE Opt	IEEE 802.3cn Cl 122 Cl 124

1.14 Interface 13 : 40 G Optical Ethernet

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

1.15 Interface 14 : 45 Mbps

S.No.	Parameter Name	Standard Name
1.15.1	DC power	ITU-T G.703. Annex-I
1.15.2	Input Jitter Tolerance for 45 Mbps Int	ITU-T G.824. Annex-I
1.15.3	Nominal Bit Rate with Tolerance for 45 Mbps Int	ITU-T G.703 Annex-I
1.15.4	Output Jitter for 45 Mbps Int	ITU-T G.824 Annex-I
1.15.5	Pulse Mask for 45 Mbps Int	ITU-T G.703. Annex-I

1.16 Interface 15 : 50G Ethernet Optical

S.No.	Parameter Name	Standard Name
1.16.1	Average Launch Power for 50 GE Opt	IEEE 802.3cn
1.16.2	Receiver Sensitivity for 50 GE Opt	IEEE 802.3cn
1.16.3	Wavelength for 50 GE Opt	IEEE 802.3cn

1.17 Interface 16 : 5 G BASE-T Ethernet

S.No.	Parameter Name	Standard Name
1.17.1	Link Speed and Auto negotiation Test 5 GE	IEEE 802.3bz. Annex-H

1.18 Interface 17 : 5G NR (FR1)

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

1.19 Interface 18 : 5G NR- FR1 and FR2 interworking with other Radios

S.No.	Parameter Name	Standard Name
1.19.1	Int Parameters for 5G NR-FR1 and FR2	3GPP TS 38.521-3. Annex-F13

	interworking with other Radios	
1.19.2	Operating frequency for 5G NR- FR1 and FR2 interworking with other Radios	NFAP. Annex-F

1.20 Interface 19 : 5G NR (FR2)

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

1.21 Interface 20 : 64 kbps

S.No.	Parameter Name	Standard Name
1.21.1	Input Jitter Tolerance for 64 kbps Int	ITU-T G.823. Annex-I
1.21.2	Input Return Loss for 64 kbps Int	ITU-T G.703. Annex-I
1.21.3	Nominal Bit Rate with Tolerance for 64 kbps Int	ITU-T G.703 Annex-I
1.21.4	Output Jitter for 64 kbps Int	ITU-T G.823. Annex-I
1.21.5	Pulse Mask for 64 kbps Int	ITU-T G.703. Annex-I

1.22 Interface 21 : 800 G Optical Ethernet

S.No.	Parameter Name	Standard Name
1.22.1	Average Launch Power for 800 GE Opt	IEEE 802.3df Cl 124 Cl 167, Annex-H
1.22.2	Receiver Sensitivity for 800 GE Opt	IEEE 802.3df Cl 124 Cl 167, Annex-H
1.22.3	Wavelength for 800 GE Opt	IEEE 802.3df Cl 124 Cl 167, Annex-H

1.23 Interface 22 : ADSLx

S.No.	Parameter Name	Standard Name
1.23.1	Bit Rate for ADSLx Int	Annex-J1
1.23.2	Impulse Noise Protection for ADSL Int	Annex-J1
1.23.3	Insulation Test for ADSL Int	Annex-J1
1.23.4	Line Port impedance for ADSLx Int	Annex-J1
1.23.5	Loop resistance for ADSLx	ETSI EN 300 001. Annex-J1
1.23.6	PSD for ADSLx Int	Annex-J1

1.23.7	Transmitted Power At ATU-C for ADSLx Int	Annex-J1

1.24 Interface 23 : CDMA

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

1.25 Interface 24 : Fast Ethernet Optical

S.No.	Parameter Name	Standard Name
1.25.1	Average Launch power for FE Opt	IEEE 802.3u. Annex-H
1.25.2	Receiver Sensitivity for FE Opt	IEEE 802.3u. Annex-H
1.25.3	Wavelength for FE Opt	IEEE 802.3u. Annex-H

1.26 Interface 25 : GSM or GPRS or EDGE

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

1.27 Interface 26 : ISDN BRI

S.No.	Parameter Name	Standard Name
1.27.1	Layer-III BRI Specification - Call Clearing	Q.931. Annex-D1
1.27.2	Layer-III BRI Specification - Call Setup	Q.931. Annex-D1

1.28 Interface 27 : ISDN PRI

S.No.	Parameter Name	Standard Name
1.28.1	Bit Rate Tolerance for PRI	G.703 Cl. 11.1 ETSI TBR-4 Cl. 9.2.3. Annex-I
1.28.2	Input Jitter Tolerance for PRI	G.823 I.431 ETSI TBR-4. Annex-I
1.28.3	Input Return Loss for PRI	G.703 Cl. 11.3 ETSI TBR-4 Cl. 9.3.1. Annex-I

1.28.4	Layer-III PRI Specification - Call Clearing	Q.931. Annex-D1
1.28.5	Layer-III PRI Specification - Call Setup	Q.931. Annex-D1
1.28.6	Output Jitter for PRI	G.823 I.431 ETSI TBR-4. Annex-I
1.28.7	Pulse Mask for PRI	G.703 Cl. 11.2 ETSI TBR-4 Cl. 9.2.1. Annex-I

1.29 Interface 28 : LTE or LTE-A

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

1.30 Interface 29 : NX64 kbps

S.No.	Parameter Name	Standard Name
1.30.1	Input Jitter Tolerance for NX64 kbps Int	ITU-T G.823. Annex-I
1.30.2	Input Return Loss for NX64 kbps Int	ITU-T G.703. Annex-I
1.30.3	Nominal Bit Rate with Tolerance for NX64 kbps Int	ITU-T G.703. Annex-I
1.30.4	Output Jitter for NX64 kbps Int	ITU-T G.823. Annex-I
1.30.5	Pulse Mask for NX64 kbps Int	ITU-T G.703. Annex-I

1.31 Interface 30 : SHDSL

S.No.	Parameter Name	Standard Name
1.31.1	Insulation Resistance for SHDSL int	G.991.2. Annex-J1
1.31.2	LCL for SHDSL Interface	G.991.2. Annex-J1
1.31.3	PSD for SHDSL Int	G.991.2. Annex-J1
1.31.4	Return Loss for SHDSL	G.991.2. Annex-J1
1.31.5	Throughput for SHDSL Interface	G.991.2. Annex-J1
1.31.6	Transmitted Power for SHDSL Int	G.991.2. Annex-J1

1.32 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

1.33 Interface 32 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
1.33.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
1.33.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
1.33.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
1.33.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K
1.33.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K

1.34 Interface 33 : STM-1 Optical

S.No.	Parameter Name	Standard Name
1.34.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
1.34.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
1.34.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
1.34.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
1.34.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 Annex-K
1.34.6	Receiver Overload for STM-1 Opt Int	ITU-T G.957. Annex-K
1.34.7	Receiver Sensitivity for STM-1 Opt Int	ITU-T G.957. Annex-K

1.35 Interface 34 : STM-4 Optical

S.No.	Parameter Name	Standard Name
1.35.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K

1.35.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
1.35.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
1.35.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
1.35.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
1.35.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
1.35.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

1.36 Interface 35 : STM-64 Optical

S.No.	Parameter Name	Standard Name
1.36.1	Input Jitter Tolerance for STM-64 Opt	ITU-T G.825. Annex-K
1.36.2	Mean Launched Power for STM-64 Opt Int	ITU-T G.691. Annex-K
1.36.3	Nominal Bit Rate with Tolerance STM-64 Opt Int	ITU-T G.707 Annex-K
1.36.4	Operating Wavelength Range for STM-64 Opt Int	ITU-T G.691. Annex-K
1.36.5	Output Jitter for STM-64 Opt Int	ITU-T G.783. Annex-K
1.36.6	Receiver Overload for STM-64 Opt Int	ITU-T G.691. Annex-K
1.36.7	Receiver Sensitivity for STM-64 Opt Int	ITU-T G.691. Annex-K

1.37 Interface 36 : VDSLx

S.No.	Parameter Name	Standard Name
1.37.1	Bit Rate for VDSLx Int	G.993.1 or G993.2. Annex-J1
1.37.2	Insulation Test for 2 wire Int	ETSI EN 300 001. Annex-D
1.37.3	Line Port impedance for VDSLx Int	G.993.1 or G.993.2 Annex-J1
1.37.4	Loop resistance for VDSLx	ETSI EN 300 001. Annex-J1
1.37.5	Profiles for VDSLx	G.993.1 or G.993.2 Annex-J1
1.37.6	PSD for VDSLx Int	G.993.1(cl 6.2). G.993.2(cl 7.2) Ann-A B C. Annex-J1
1.37.7	Return Loss for VDSLx	G.993.1 or G.993.2 Annex-J1
1.37.8	Transmitted Power At ATU-C for VDSLx Int	G.993.1 or G.993.2 Annex-J1

1.38 Interface 37 : WCDMA or HSPA

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

1.39 Interface 38 : WiFi

S.No.	Parameter Name	Standard Name
1.39.1	2.4 GHz WiFi Radio Conformance	ETSI EN 300 328 or FCC CFR47 pt 15.247 or FCC CFR47 pt 15.249. Annex-G3
1.39.2	5 GHz WiFi Radio Conformance	ETSI EN 301 893 and or ETSI EN 302 502 or FCC CFR47 pt 15.407 or FCC CFR47 pt 15.249. Annex-G3
1.39.3	EIRP for Wifi Interface	Latest NFAP and GSRs issued by DoT WPC. Annex-G2
1.39.4	Frequency for WiFi equipments	DoT WPC GSR No. 45(E) 1048(E). Annex-G1