

अनिवार्य आवश्यकताएं

संख्या : TEC5643XXXX

Essential Requirements

ER No. : TEC5643XXXX

E-band Fixed Radio Relay Systems

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Essential Requirements for:

E-band Fixed Radio Relay Systems

Certification Scheme: **GCS**

Product Fee Group: **C**

This ER covers E-band point-to-point digital integrated radio relay systems operating in 71-76/81-86 GHz frequency band. This ER contains two variants; one is Full outdoor system and another one is combination of Outdoor system plus Indoor system.

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. E-Band MW Full Outdoor System
2. E-Band MW Outdoor System plus Indoor System

1. Variant 1 : E-Band MW Full Outdoor System

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	E-Band_Adjacent_Channel_C/I	Clause 2.5.3 of TEC Standard 36060:2022 OR ETSI EN 302 217-2 Annex C3
1.1.3	E-Band_Co-channel_C/I	Clause 2.5.2 of TEC Standard 36060:2022. OR ETSI EN 302 217-2 Annex C3
1.1.4	E-Band_Tx/Rx Separation	Clause 2.1.4 of TEC Standard 36060:2022 OR ETSI EN 302 217-2 Annex C3
1.1.5	E-Band_TX Spurious_Harmonics	Clause 2.2.5 of TEC Standard 36060:2022. OR ETSI EN 302 217-2 Annex C3
1.1.6	Frequency for E-Band Radio Interface	As per DoT WPC NFAP OR Clause 2.1.1 of TEC Standard 36060:2022 Annex-C1

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	Maximum Transmitted Power for E-Band Radio Interface	As per DoT WPC license conditions. OR Clause 2.2.1 of TEC Standard 36060:2022. AnnexC2

1.2 Interface 1 : 10 G Optical Ethernet

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

1.3 Interface 2 : 1 G Optical Ethernet

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

1.4 Interface 3 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
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1.4.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
1.4.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
1.4.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

1.5 Interface 4 : Fast Ethernet Electrical

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

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

2. Variant 2 : E-Band MW Outdoor System plus Indoor System

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 32 EN550 32. Annex-B
2.1.2	E-Band_Adjacent_Channel_C/I	Clause 2.5.3 of TEC Standard 36060:2022 OR ETSI EN 302 217-2 Annex C3
2.1.3	E-Band_Co-channel_C/I	Clause 2.5.2 of TEC Standard 36060:2022. OR ETSI EN 302 217-2 Annex C3
2.1.4	E-Band_Tx/Rx Separation	Clause 2.1.4 of TEC Standard 36060:2022 OR ETSI EN 302 217-2 Annex C3
2.1.5	E-Band_TX Spurious_Harmonics	Clause 2.2.5 of TEC Standard 36060:2022. OR ETSI EN 302 217-2 Annex C3
2.1.6	Frequency for E-Band Radio Interface	As per DoT WPC NFAP OR Clause 2.1.1 of TEC Standard 36060:2022 Annex-C1
2.1.7	Immunity to AC Voltage Dips and Short Interruptions	TEC EMI EMC Standard EN/IEC:61000-4-11. Annex-B
2.1.8	Immunity to DC Voltage Dips and Short Interruptions	EN/IEC:61000-4-29. Annex-B

2.1.9	Immunity to Electrostatic Discharge	TEC EMI EMC Standard EN/IEC:61000-4-2. Annex-B
2.1.10	Immunity to Fast Transients (Burst)	TEC EMI EMC Standard EN/IEC:61000-4-4. Annex-B
2.1.11	Immunity to Radiated RF	TEC EMI EMC Standard EN/IEC:61000-4-3. Annex-B
2.1.12	Immunity to RF Field Induced Conducted Disturbance	TEC EMI EMC Standard EN/IEC:61000-4-6. Annex-B
2.1.13	Immunity to Surges	TEC EMI EMC Standard EN/IEC:61000-4-5.

		Annex-B
2.1.14	IT Equipment Safety	IS 13252-1 or IEC:60950-1 or IEC 62368-1. Annex-A1
2.1.15	Maximum Transmitted Power for E-Band Radio Interface	As per DoT WPC license conditions. OR Clause 2.2.1 of TEC Standard 36060:2022. AnnexC2

2.2 Interface 1 : 10 G Optical Ethernet

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

2.3 Interface 2 : 1 G Optical Ethernet

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

2.4 Interface 3 : 25 G Optical Ethernet

S.No.	Parameter Name	Standard Name
2.4.1	Average Launch Power for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
2.4.2	Receiver Sensitivity for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114
2.4.3	Wavelength for 25 GE Opt	IEEE 802.3 - 2018 Cl. 114

2.5 Interface 4 : 2 Mbps - E1

S.No.	Parameter Name	Standard Name
2.5.1	Input Jitter Tolerance for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.5.2	Input Return Loss for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.3.1. Annex-I
2.5.3	Nominal Bit Rate with Tolerance for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.3. Annex-I
2.5.4	Output Jitter for 2 Mbps Int	ITU-T G.823 / ETSI TBR-4. Annex-I
2.5.5	Pulse Mask for 2 Mbps Int	ITU-T G.703 / ETSI TBR-4 Cl. 9.2.1. Annex-I

2.6 Interface 5 : Fast Ethernet Electrical

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

2.7 Interface 6 : Gigabit Ethernet Electrical

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

2.8 Interface 7 : STM-16 Optical

S.No.	Parameter Name	Standard Name
2.8.1	Input Jitter Tolerance for STM-16 Opt	G.825. Annex-K
2.8.2	Mean Launched Power for STM-16 Opt Int	ITU-T G.957. Annex-K
2.8.3	Nominal Bit Rate with Tolerance STM-16 Opt Int	ITU-T G.957. Annex-K
2.8.4	Operating Wavelength Range for STM-16 Opt Int	ITU-T G.957. Annex-K
2.8.5	Output Jitter for STM-16 Opt Int	ITU-T G.783. Annex-K
2.8.6	Receiver Overload for STM-16 Opt Int	ITU-T G.957. Annex-K
2.8.7	Receiver Sensitivity for STM-16 Opt Int	ITU-T G.957. Annex-K

2.9 Interface 8 : STM-1 Electrical

S.No.	Parameter Name	Standard Name
2.9.1	Input Jitter Tolerance STM-1 Electrical	ITU-T G.825. Annex-K
2.9.2	Input Return Loss for STM-1 Electrical	ITU-T G.703. Annex-K
2.9.3	Nominal Bit Rate with Tolerance STM-1 Electrical Int	ITU-T G.703. Annex-K
2.9.4	Output Jitter for STM-1 Electrical Int	ITU-T G.825. Annex-K
2.9.5	Pulse Mask for STM-1 Electrical Int	ITU-T G.703. Annex-K

2.10 Interface 9 : STM-1 Optical

S.No.	Parameter Name	Standard Name
2.10.1	Input Jitter Tolerance for STM-1 Opt	ITU-T G.825. Annex-K
2.10.2	Mean Launched Power for STM-1 Opt Int	ITU-T G.957. Annex-K
2.10.3	Nominal Bit Rate with Tolerance STM-1 Opt Int	ITU-T G.957. Annex-K
2.10.4	Operating Wavelength Range for STM-1 Opt Int	ITU-T G.957. Annex-K
2.10.5	Output Jitter for STM-1 Opt Int	ITU-T G.783 G.825 Annex-K

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

2.11 Interface 10 : STM-4 Optical

S.No.	Parameter Name	Standard Name
2.11.1	Input Jitter Tolerance for STM-4 Opt	ITU-T G.825. Annex-K
2.11.2	Mean Launched Power for STM-4 Opt Int	ITU-T G.957. Annex-K
2.11.3	Nominal Bit Rate with Tolerance STM-4 Opt Int	ITU-T G.957 Annex-K
2.11.4	Operating Wavelength Range for STM-4 Opt Int	ITU-T G.957. Annex-K
2.11.5	Output Jitter for STM-4 Opt Int	ITU-T G.783. Annex-K
2.11.6	Receiver Overload for STM-4 Opt Int	ITU-T G.957. Annex-K
2.11.7	Receiver Sensitivity for STM-4 Opt Int	ITU-T G.957. Annex-K

DRAFT

Annexure

Comments on revision of standard for ER Titled “ E-Band fixed Radio Relay Systems (Draft ER no. TEC5643XXXX)

Name:

Organization:

Contact Details:

<u>S. No</u>	<u>Clause No</u>	<u>Clause</u>	<u>Comments</u>	<u>Other Remarks(If Any)</u>

Note: The ER of “E-band fixed radio relay systems” is being revised with addition of interface: 25 G Optical Ethernet (Interface 3 in variant 1 & variant 2). The comments on the revision of ER titled “E-band fixed radio relay systems” may be provided in the above format vide e-mail to **dirr2.tec@gov.in**, **adetr.tec@gov.in**