



**GOVERNMENT OF INDIA
MINISTRY OF COMMUNICATIONS
DEPARTMENT OF TELECOMMUNICATIONS
TELECOMMUNICATION ENGINEERING CENTRE
Gate No. 5, Khurshid Lal Bhawan, Janpath, New Delhi-110001**

CERTIFICATE OF DESIGNATION

**M/S SUNREN TELECOM LABORATORY, MUMBAI
(A Division of M/s Sunren Technical Solutions Pvt. Ltd.)**

has been assessed and designated as Conformity Assessment Body (CAB)

for its facilities at

C-475 TTC Industrial Area Pawane, MIDC Navi Mumbai, Maharashtra-400705

In the field of Testing

Certificate No. TEC/MRA/CAB/IND-D/68

Issue Date: 12/01/2024

Validity: 12/01/2024 to 11/01/2027

This Certificate remains valid for the Scope of Designation as specified in the Annexure subject to the continued validity of NABL Accreditation and satisfied compliance to the Standards/specifications against which lab has been designated and strict compliance to the relevant terms and conditions of TEC CAB Designation Scheme.

(To see the scope of designation of this laboratory, you may also visit TEC website www.tec.gov.in)

Signed for and on behalf of TEC

**Vijay Dixit
Director (CA)
For Designating Authority
TEC**

**Certificate No: TEC/MRA/CAB/IND-D/68 dated 12/01/2024 issued to
M/s Sunren Telecom Laboratory, Mumbai
(A Division of M/s Sunren Technical Solutions Pvt. Ltd.)
C-475 TTC Industrial Area Pawane, MIDC Navi Mumbai,
Maharashtra-400705**



Validity: - 12/01/2024 to 11/01/2027

Terms & Conditions

This certificate is issued as per the terms and conditions stipulated in the TEC SCHEME FOR DESIGNATING DOMESTIC CONFORMITY ASSESEMENT BODIES AND CERTIFICATION BODIES FOR CONFORMITY ASSESEMENT AND CERTIFICATION OF TELECOMMUNICATION EQUIPMENT ISSUE 3 NO. TEC 04019:2023.

Some of the conditions are reiterated as under:

A. Obligations of the Designated CAB.

1. It shall ensure that it maintains its accreditation status from any recognised Indian accreditation body like NABL during validity period of certificate.
2. It shall follow the stipulated procedures, rules and policies laid down by Designating Authority (DA) or Mutual Recognition Agreement (MRA)* partner for testing and evaluation.
3. In respect of tests for which it is seeking designation, it shall have no interest whatsoever in any business to carry on testing in an unfair or biased manner.
4. It shall fully indemnify DA from and against all liabilities, damages, claims, costs, and expenses incurred or sustained by DA as a result of any action taken or omitted by DA relating to the process of designation.
5. It shall comply with DA's or MRA partner's terms and conditions for designation and recognition as modified from time to time.
6. It shall be under obligation to participate in the online process prescribed by TEC for test and certification against TEC's GR/IR/ER and standards.
7. It shall have a record system which shall have a retention period of at least 5 years for documents related to the equipment testing. It shall maintain all the relevant documents including list of products submitted for testing, product-wise testing and evaluation reports. These documents shall be produced before the DA within seven days, as and when required.
8. It shall ensure the Intellectual Property Rights of the customers in the course of testing by maintaining professional ethics, secrecy and keeping all the product related information confidential.

*Applicable only if recognized by MRA (Mutual Recognition Agreement) partner.

9. It shall notify the DA in writing of occurrence of any of the following incident(s) within 2 weeks of its occurrence
 - a) Cessation of its business of conformity assessment for which it is Designated or accredited
 - b) Changes in its legal, commercial, or Organisational status
 - c) Changes, which may affect continuing compliance with any of the criteria or requirement specified by DA or MRA partner.
 - d) Change of premises

B. REFERENCE TO DESIGNATION STATUS

1. Designated CABs may advertise their designation status with regard to standards or parts thereof which are included in the scope of designation.
2. The advertisement should not imply, or otherwise suggest that DA or MRA Partner has endorsed the product or imply that the designated CAB is an agent or representative of DA or MRA Partner.
3. CABs whose designations have been suspended or withdrawn for any reason, shall discontinue advertisement of their designated status and not make any misleading statements regarding their designation status.

C. POST-DESIGNATION SURVEILLANCE

As and when required, DA shall conduct surveillance assessments and other non-routine assessments on the Designated CABs to ensure that standards of practices are maintained as well as to investigate complaints made against them.

D. SUSPENSION OR WITHDRAWAL OF DESIGNATION

1. DA shall suspend or withdraw the designation of a CAB if
 - a. Its accreditation is withdrawn.
 - b. It is found that the CAB is not complying with the stipulated criteria or requirements.
 - c. It is guilty of any offence involving fraud or dishonesty.
 - d. DA concludes that there is a just cause for withdrawing the designation.
2. A CAB whose designation, and recognition in case of MRA, has been suspended or withdrawn shall be removed from the list of designated CABs, in case it fails to take corrective measures.
3. DA shall keep the designation of a Designated CAB under suspension, until the completion of formal review process.

E. AMENDMENT TO THE SCHEME

DA reserves the rights to amend the scheme, as and when required, for the purpose of streamlining designation process.

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SCOPE OF DESIGNATION
(Annexure)

Laboratory Name: M/s Sunren Telecom Laboratory, Mumbai
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Validity: 12/01/2024 to 11/01/2027

Last Amended on: ----

Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
1.	Information Technology Equipment-Safety Requirement	Power Interface Clause- 1.6	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Markings and Instructions Clause- 1.7	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Protection from Electric Shock and Energy Hazards Clause- 2.1	IEC 60950-1: 2005 + A1:2009 + A2:2013
		SELV Circuits Clause- 2.2	IEC 60950-1: 2005 + A1:2009 + A2:2013
		TNV Circuit Clause- 2.3	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Limited Current Circuit Clause- 2.4	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Limited Power Source Clause- 2.5	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Provisions for Earthing and Bonding Clause- 2.6	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Over current and Earth Fault Protection in Primary Circuits and Safety Interlocks Clause- 2.7, 2.8 except 2.8.5, 2.8.7	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Electrical Insulation Clause- 2.9	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Clearances and Creepage distances and distance through insulation Clause- 2.10.1 to 2.10.4, 2.10.5.1 to 2.10.5.5, 2.10.5.7, 2.10.5.9, 2.10.5.10 & 2.10.6	IEC 60950-1: 2005 + A1:2009 + A2:2013

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Information Technology Equipment-Safety Requirement	Wiring, Connections and Supply General Clause- 3.1	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Connection to a Main Supply Clause- 3.2 except 3.2.5	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Wiring terminals for connection of External Conductors Clause- 3.3	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Disconnection from the Main Supply Clause- 3.4	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Interconnection of Equipment Clause- 3.5	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Physical requirements Stability Clause- 4.1	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Mechanical Strength Clause- 4.2 except 4.2.8, 4.2.9	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Design and Construction Clause- 4.3 except 4.3.10, 4.3.11, 4.3.12	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Protection against Hazardous Moving Parts Clause- 4.4	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Thermal Requirements Clause- 4.5	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Opening in Enclosure Clause- 4.6 except 4.6.2	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Electrical requirements and simulated abnormal conditions Touch current and Protective Conductor Current Clause- 5.1	IEC 60950-1: 2005 + A1:2009 + A2:2013

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Information Technology Equipment-Safety Requirement	Electric Strength Clause- 5.2	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Abnormal Operating and Fault Conditions Clause- 5.3	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Connection to Telecommunication Network Clause- 6.1, 6.2, 6.3	IEC 60950-1: 2005 + A1:2009 + A2:2013
		Connection to Cable Distribution System Clause- 7.1, 7.2, 7.3, 7.4 except 7.4.2	IEC 60950-1: 2005 + A1:2009 + A2:2013
2.	EMI/EMC Testing of Telecommunication Equipment	Electrostatic Discharge Immunity (ESD) Test IEC 61000-4-2	TEC/SD/DD/EMC-221/05/OCT-16
		Electrical Fast Transient (EFT)/ Burst Immunity Test IEC 61000-4-4	TEC/SD/DD/EMC-221/05/OCT-16
		Surge Immunity Test IEC 61000-4-5	TEC/SD/DD/EMC-221/05/OCT-16
3.	Transmission Terminal Equipment-1	Interface: GPON Operating Wavelength in Downstream direction for GPON Int. ITU-T G.984.2, Cl. 8.2.5.1	TEC ER No. TEC78832401
		Operating Wavelength in upstream direction for GPON Int. ITU-T G.984.2, Cl. 8.2.5.2	TEC ER No. TEC78832401
		Opt Output Power for GPON Int. at OLT ITU-T G.984.2	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: GPON	Opt Output Power for GPON Int. at ONT ITU-T G.984.2	TEC ER No. TEC78832401
			Receiver Sensitivity for GPON Int. at OLT ITU-T G.984.2	TEC ER No. TEC78832401
			Receiver Sensitivity for GPON Int. at ONT ITU-T G.984.2	TEC ER No. TEC78832401
		Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex D	TEC ER No. TEC78832401
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC78832401
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC78832401
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21, Cl.4.4.3 Annex-D	TEC ER No. TEC78832401
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: 1G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC78832401
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC78832401
			Wavelength IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC78832401
		Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H	TEC ER No. TEC78832401
			Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H	TEC ER No. TEC78832401
		Interface: 10G Optical Ethernet	Average Launch Power IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC78832401
			Receiver Sensitivity IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC78832401
			Wavelength IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC78832401
		Interface: ISDN PRI	Bit Rate Tolerance for PRI ITU-T G.703 Clause no. 11.1 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Clause no. 11.2 Annex-I	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Transmission Terminal Equipment-1	Input Return Loss ITU-T G.703 Clause no. 11.3 Annex-I	TEC ER No. TEC78832401
		Output Jitter ITU-T G.823 Clause no. 5.1 Annex-I	TEC ER No. TEC78832401
		Input Jitter Tolerance ITU-T G.823 Clause no. 7.1.2 Annex-I	TEC ER No. TEC78832401
		Layer-III PRI Specification - Call Setup ITU-T Q.931 Clause no.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC78832401
		Layer-III PRI Specification - Call Clearing ITU-T Q.931 Clause no.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: 2 Mbps -E1	Input Jitter Tolerance ITU-T G.823 ETSI TBR-4 Annex-I	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC78832401
		Interface: 8 Mbps-E2	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.823 Annex-I	TEC ER No. TEC78832401
		Interface: 34 Mbps-E3	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: 34 Mbps-E3	Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC78832401
		Interface: 45 Mbps	DC Power ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC78832401
		Interface: 64 Kbps	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC78832401
		Interface: Nx64 kbps	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: Nx64 kbps	Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC78832401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC78832401
		Interface: STM-1 Electrical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC78832401
			Input Return Loss ITU-T G.703 Annex-K	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-K	TEC ER No. TEC78832401
			Output Jitter ITU-T G.825 Annex-K	TEC ER No. TEC78832401
			Pulse Mask ITU-T G.703 Annex-K	TEC ER No. TEC78832401
			Interface: STM-1 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K
		Mean Launched Power ITU-T G.957 Annex-K		TEC ER No. TEC78832401
		Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K		TEC ER No. TEC78832401
		Operating Wavelength Range ITU-T G.957 Annex-K		TEC ER No. TEC78832401
		Output Jitter ITU-T G.783 Annex-K		TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: STM-1 Optical	Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC78832401
		Interface: STM-4 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC78832401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC78832401
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC78832401
		Interface: STM-16 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC78832401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC78832401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-1	Interface: STM-16 Optical	Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC78832401
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC78832401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC78832401
4	Transmission Terminal Equipment-2	Parameters Linked with Product Variants	Channel spacing for 10G/40G/100G DWDM ITU-T G.694.1	TEC ER No. TEC70122401
		Interface: 100 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC70122401
			Receiver Sensitivity IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC70122401
			Wavelength IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC70122401
		Interface: 1G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC70122401
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC70122401

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SCOPE OF DESIGNATION
(Annexure)

Laboratory Name: M/s Sunren Telecom Laboratory, Mumbai
(A Division of M/s Sunren Technical Solutions Pvt. Ltd.)
C-475 TTC Industrial Area Pawane, MIDC Navi Mumbai,
Maharashtra-400705

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Transmission Terminal Equipment-2	Interface: 1G Optical Ethernet	Wavelength IEEE 802.3z Cl. 38 Annex-H TEC ER No. TEC70122401
		Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H TEC ER No. TEC70122401
		Interface: 10/100 BASE-T Ethernet	Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H TEC ER No. TEC70122401
		Interface: 10G Optical Ethernet	Average Launch Power IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC70122401
			Receiver Sensitivity IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC70122401
			Wavelength IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC70122401
		Interface: 40 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC70122401
			Receiver Sensitivity IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC70122401
			Wavelength IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC70122401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Transmission Terminal Equipment-2	Interface: ISDN PRI Bit Rate Tolerance for PRI ITU-T G.703 Clause no. 11.1 Annex-I	TEC ER No. TEC70122401
		Pulse Mask ITU-T G.703 Clause no. 11.2 Annex-I	TEC ER No. TEC70122401
		Input Return Loss ITU-T G.703 Clause no. 11.3 Annex-I	TEC ER No. TEC70122401
		Output Jitter ITU-T G.823 Clause no. 5.1 Annex-I	TEC ER No. TEC70122401
		Input Jitter Tolerance ITU-T G.823 Clause no. 7.1.2 Annex-I	TEC ER No. TEC70122401
		Layer-III PRI Specification - Call Setup ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC70122401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-2	Interface: ISDN PRI	Layer-III PRI Specification – Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC70122401
		Interface: 8 Mbps–E2	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC70122401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC70122401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC70122401
			Pulse Mask ITU-T G.823 Annex-I	TEC ER No. TEC70122401
		Interface: 140 Mbps – E4	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC70122401
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC70122401
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC70122401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Transmission Terminal Equipment-2	Interface: 140 Mbps – E4	Pulse Mask ITU-T G.703 Annex-I TEC ER No. TEC70122401
		Interface: 64kbps	Input Jitter Tolerance ITU-T G.823 Annex-I TEC ER No. TEC70122401
			Input Return Loss ITU-T G.703 Annex-I TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I TEC ER No. TEC70122401
			Output Jitter ITU-T G.823 Annex-I TEC ER No. TEC70122401
			Pulse Mask ITU-T G.703 Annex-I TEC ER No. TEC70122401
			Interface: STM-1 Electrical
		Input Return Loss ITU-T G.703 Annex-K TEC ER No. TEC70122401	
		Nominal Bit Rate with Tolerance ITU-T G.703 Annex-K TEC ER No. TEC70122401	
		Output Jitter ITU-T G.825 Annex-K TEC ER No. TEC70122401	
		Pulse Mask ITU-T G.703 Annex-K TEC ER No. TEC70122401	

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-2	Interface: STM-1 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC70122401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC70122401
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC70122401
		Interface: STM-4 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC70122401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC70122401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Transmission Terminal Equipment-2	Interface: STM-4 Optical	Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC70122401
		Interface: STM-16 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC70122401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC70122401
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC70122401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC70122401
5. Router	Parameters linked with Product Variants	Dynamic Routing RFC 4728, Annex-P11 (Functional Testing)	TEC ER No. TEC37682308	
		Radius RFC 2865 (Functional testing)	TEC ER No. TEC37682308	

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
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	Router	Parameters linked with Product Variants	PPPoE RFC 2516 (Functional testing)	TEC ER No. TEC37682308
			Manageability SNMP v2 or v3 RFC 3410, RFC 3416 (Functional testing)	TEC ER No. TEC37682308
		Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H	TEC ER No. TEC37682308
		Interface: 10/100 BASE-T Ethernet	Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H	TEC ER No. TEC37682308
		Interface: 1 G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37682308
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37682308
			Wavelength IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37682308
		Interface: 10 G Optical Ethernet	Average Launch Power IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC37682308
			Receiver Sensitivity IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC37682308
			Wavelength IEEE 802.3ae Cl. 52 Annex-H	TEC ER No. TEC37682308

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Router	Interface: 100 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC37682308
			Receiver Sensitivity IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC37682308
			Wavelength IEEE 802.3ba Cl. 86 88 Annex-H	TEC ER No. TEC37682308
		Interface: 40 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 87 Annex-H	TEC ER No. TEC37682308
			Receiver Sensitivity IEEE 802.3ba Cl. 86 87 Annex-H	TEC ER No. TEC37682308
			Wavelength IEEE 802.3ba Cl. 86 87 Annex-H	TEC ER No. TEC37682308
		Interface: ISDN BRI	Layer-III BRI Specification - Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC37682308

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Router	Interface: ISDN BRI Layer-III BRI Specification - Call Setup ITU-T Q.931 Clause No.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC37682308
		Interface: ISDN PRI Bit Rate Tolerance for PRI ITU-T G.703 Clause no. 11.1 Annex-I	TEC ER No. TEC37682308
		Pulse Mask ITU-T G.703 Clause no. 11.2 Annex-I	TEC ER No. TEC37682308
		Input Return Loss ITU-T G.703 Clause no. 11.3 Annex-I	TEC ER No. TEC37682308
		Output Jitter ITU-T G.823 Clause no. 5.1 Annex-I	TEC ER No. TEC37682308
		Input Jitter Tolerance ITU-T G.823 Clause no. 7.1.2 Annex-I	TEC ER No. TEC37682308

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Router	Interface: ISDN PRI	Layer-III PRI Specification - Call Setup ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC37682308
			Layer-III PRI Specification – Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC37682308
		Interface: 2 Mbps-E1	Input Jitter Tolerance ITU-T G.823 ETSI TBR-4 Annex-I	TEC ER No. TEC37682308
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC37682308

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
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	Router	Interface: 2 Mbps-E1	Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC37682308
		Interface: 34 Mbps-E3	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC37682308
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC37682308
			Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Interface: 45 Mbps	DC Power ITU-T G.703 Annex-I
		Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I		TEC ER No. TEC37682308
		Pulse Mask ITU-T G.703 Annex-I		TEC ER No. TEC37682308
		Interface: 64kbps	Input Jitter Tolerance ITU-T G.823 Annex-I	TEC ER No. TEC37682308
			Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC37682308
			Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC37682308

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing		Standard/Specification
	Router	Interface: 64kbps	Pulse Mask	TEC ER No.
			ITU-T G.703 Annex-I	TEC37682308
		Interface: Nx64 kbps	Input Jitter Tolerance	TEC ER No.
			ITU-T G.823 Annex-I	TEC37682308
			Input Return Loss	TEC ER No.
			ITU-T G.703 Annex-I	TEC37682308
			Nominal Bit Rate with Tolerance	TEC ER No.
			ITU-T G.703 Annex-I	TEC37682308
		Interface: STM-1 Electrical	Output Jitter	TEC ER No.
			ITU-T G.823 Annex-I	TEC37682308
			Pulse Mask	TEC ER No.
			ITU-T G.703 Annex-I	TEC37682308
			Input Jitter Tolerance	TEC ER No.
			ITU-T G.825 Annex-K	TEC37682308
	Input Return Loss		TEC ER No.	
	ITU-T G.703 Annex-K		TEC37682308	
	Nominal Bit Rate with Tolerance	TEC ER No.		
	ITU-T G.703 Annex-K	TEC37682308		
	Output Jitter	TEC ER No.		
	ITU-T G.825 Annex-K	TEC37682308		
	Pulse Mask	TEC ER No.		
	ITU-T G.703 Annex-K	TEC37682308		

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Router	Interface: STM-1 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC37682308
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC37682308
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC37682308
		Interface: STM-4 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC37682308
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC37682308

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SCOPE OF DESIGNATION
(Annexure)

Laboratory Name: M/s Sunren Telecom Laboratory, Mumbai
(A Division of M/s Sunren Technical Solutions Pvt. Ltd.)
C-475 TTC Industrial Area Pawane, MIDC Navi Mumbai,
Maharashtra-400705

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Router	Interface: STM-4 Optical	Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC37682308
		Interface: STM-16 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC37682308
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC37682308
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC37682308
			6.	IP Security Equipment

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	IP Security Equipment	Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H TEC ER No. TEC34732401
		Interface: 10/100 BASE-T Ethernet	Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H TEC ER No. TEC34732401
		Interface: 1G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H TEC ER No. TEC34732401
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H TEC ER No. TEC34732401
			Wavelength IEEE 802.3z Cl. 38 Annex-H TEC ER No. TEC34732401
		Interface: 10G Optical Ethernet	Average Launch Power IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC34732401
			Receiver Sensitivity IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC34732401
			Wavelength IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC34732401
		Interface: 100 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 88 Annex-H TEC ER No. TEC34732401
			Receiver Sensitivity IEEE 802.3ba Cl. 86 88 Annex-H TEC ER No. TEC34732401

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	IP Security Equipment	Interface: 100 G Optical Ethernet	Wavelength IEEE 802.3ba Cl. 86 88 Annex-H TEC ER No. TEC34732401		
		Interface: 40 G Optical Ethernet	Average Launch Power IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC34732401		
			Receiver Sensitivity IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC34732401		
			Wavelength IEEE 802.3ba Cl. 86 87 Annex-H TEC ER No. TEC34732401		
		Interface: Fast Ethernet Optical	Average Launch Power IEEE 802.3u Annex-H TEC ER No. TEC34732401		
			Receiver Sensitivity IEEE 802.3u Annex-H TEC ER No. TEC34732401		
			Wavelength IEEE 802.3u Annex-H TEC ER No. TEC34732401		
		7.	Precision Timing Protocol (PTP) Grand Master (GM) Equipment	Parameters Linked with Product Variant	Manageability SNMP v2 or v3 RFC 3410, RFC 3416 (Functional testing) TEC ER No. TEC37872401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification		
	Precision Timing Protocol (PTP) Grand Master (GM) Equipment	Interface: 1G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37872401	
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37872401	
			Wavelength IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC37872401	
		Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H	TEC ER No. TEC37872401	
			Interface: 2 Mbps-E1	Input Jitter Tolerance ITU-T G.823 ETSI TBR-4 Annex-I	TEC ER No. TEC37872401
				Input Return Loss ITU-T G.703 Annex-I	TEC ER No. TEC37872401
				Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I	TEC ER No. TEC37872401
				Output Jitter ITU-T G.823 Annex-I	TEC ER No. TEC37872401
				Pulse Mask ITU-T G.703 Annex-I	TEC ER No. TEC37872401
				8. PABX	Interface: Fast Ethernet Electrical

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	PABX	Interface: Gigabit Ethernet Electrical	Link Speed and Auto Negotiation Test GE IEEE 802.3Annex-H TEC ER No. TEC67292301
		Interface: 2-Wire Trunk	Current on Junction/ Trunk Line in PABX ETSI EN 300 001 Annex-D TEC ER No. TEC67292301
			DC Resistance ETSI TBR-21 Clause 4.4.1 Annex-D TEC ER No. TEC67292301
			Longitudinal Conversion Loss for 2W Trunk Int. Clause No. 2.2.2 & Figure-2 of ITU-T Q.552 Annex-D TEC ER No. TEC67292301
			Resistance to Earth Clause No. 4.4.4 of ETSI TBR-21 Annex-D TEC ER No. TEC67292301
			Return Loss for 2 W Trunk Int. Clause No. 2.2.1.2 & Figure-1 of ITU-T Q.552 Annex-D TEC ER No. TEC67292301
			Transmission of DTMF Signalling Clause 6 & 7 of ITU-T Q.23 Annex-D TEC ER No. TEC67292301
			Interface: ISDN PRI

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	PABX	Interface: ISDN PRI Pulse Mask ITU-T G.703 Clause no. 11.2 Annex-I	TEC ER No. TEC67292301
		Input Return Loss ITU-T G.703 Clause no. 11.3 Annex-I	TEC ER No. TEC67292301
		Output Jitter ITU-T G.823 Clause no. 5.1 Annex-I	TEC ER No. TEC67292301
		Input Jitter Tolerance ITU-T G.823 Clause no. 7.1.2 Annex-I	TEC ER No. TEC67292301
		Layer-III PRI Specification - Call Setup ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC67292301
		Layer-III PRI Specification – Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC67292301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
9.	ISDN Customer Premises Equipment	Interface: Fast Ethernet Electrical Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H	TEC ER No. TEC64732301	
		Interface: Gigabit Ethernet Electrical Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H	TEC ER No. TEC64732301	
		Interface: 2-Wire Trunk	Current on Junction/ Trunk Line in PABX ETSI EN 300 001 Annex-D	TEC ER No. TEC64732301
			DC Resistance ETSI TBR-21 Clause 4.4.1 Annex-D	TEC ER No. TEC64732301
			Longitudinal Conversion Loss for 2W Trunk Int. Clause No. 2.2.2 & Figure-2 of ITU-T Q.552 Annex-D	TEC ER No. TEC64732301
			Resistance to Earth Clause No. 4.4.4 of ETSI TBR-21 Annex-D	TEC ER No. TEC64732301
			Return Loss for 2 W Trunk Int. Clause No. 2.2.1.2 & Figure-1 of ITU-T Q.552 Annex-D	TEC ER No. TEC64732301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	ISDN Customer Premises Equipment	Interface: 2-Wire Trunk Transmission of DTMF Signalling Clause 6 & 7 of ITU-T Q.23 Annex-D	TEC ER No. TEC64732301
		Interface: ISDN BRI Layer-III BRI Specification - Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC64732301
		Layer-III BRI Specification - Call Setup ITU-T Q.931 Clause No.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC64732301
		Interface: ISDN PRI Bit Rate Tolerance for PRI ITU-T G.703 Clause no. 11.1 Annex-I	TEC ER No. TEC64732301
		Pulse Mask ITU-T G.703 Clause no. 11.2 Annex-I	TEC ER No. TEC64732301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	ISDN Customer Premises Equipment	Interface: ISDN PRI Input Return Loss ITU-T G.703 Clause no. 11.3 Annex-I	TEC ER No. TEC64732301
		Output Jitter ITU-T G.823 Clause no. 5.1 Annex-I	TEC ER No. TEC64732301
		Input Jitter Tolerance ITU-T G.823 Clause no. 7.1.2 Annex-I	TEC ER No. TEC64732301
		Layer-III PRI Specification - Call Setup ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC64732301
		Layer-III PRI Specification – Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message Annex-D1	TEC ER No. TEC64732301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
10.	2- Wire Telephone Equipment	Parameters Linked with Product Variant	Acoustic Shock Absorption P.360 Clause 4.1 Annex-D	TEC ER No. TEC18352108
			Over voltage current Protection ITU-T K.21 Annex-D	TEC ER No. TEC18352108
		Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D	TEC ER No. TEC18352108
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC18352108
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC18352108
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	TEC ER No. TEC18352108
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC18352108
		Interface: ISDN BRI	Layer-III BRI Specification - Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC18352108

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	2- Wire Telephone Equipment	Interface: ISDN BRI	Layer-III BRI Specification - Call Setup ITU-T Q.931 Clause No.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message TEC ER No. TEC18352108
11.	Point of Sale Devices (PoS)	Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D TEC ER No. TEC17672301
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D TEC ER No. TEC17672301
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D TEC ER No. TEC17672301
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D TEC ER No. TEC17672301
		Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D TEC ER No. TEC17672301	
		Interface: Bluetooth Low Energy (BLE)	EIRP for BLE interface (Conducted Only) $\leq 4W$ (36 dBm) As per WPC GSR 45(E) TEC ER No. TEC17672301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
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	Point of Sale Devices (PoS)	Interface: Bluetooth Low Energy (BLE)	ETSI EN 300 328 Clause 4.3.1.2 or 4.3.2.2	
			Frequency of Operation of BLE int. (Conducted Only) Latest NFAP Annexure-1 2.4 GHz to 2.4835 GHz (As per WPC GSR 45(E))	TEC ER No. TEC17672301
			Spurious Emission for BLE Interface (Conducted Only) As per ETSI EN 300 328 Clause 4.3.1.10 or 4.3.2.9	TEC ER No. TEC17672301
		Interface: RFID	Permitted range of operating frequencies Latest NFAP Annexure-150 KHz to 200 KHz And / OR 13.553 MHz to 13.567MHz	TEC ER No. TEC17672301
		Interface: Wi-Fi	RF Output Power ETSI EN 300 328 Clause 5.4.2.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Interface: Wi-Fi	Power Spectral Density ETSI EN 300 328 Clause 5.4.3.2.1 (For Conducting testing only)	TEC ER No. TEC17672301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Point of Sale Devices (PoS)	Interface: Wi-Fi Hopping Frequency Separation ETSI EN 300 328 Clause 5.4.5.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Adaptivity ETSI EN 300 328 Clause 5.4.6.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Occupied Channel Bandwidth/20 dB Bandwidth ETSI EN 300 328 Clause 5.4.7.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Transmitter unwanted emissions in the Out- of-band domain ETSI EN 300 328 Clause 5.4.8.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Transmitter unwanted emissions in the spurious domain ETSI EN 300 328 Clause 5.4.9.2.1 (For Conducting testing only)	TEC ER No. TEC17672301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Point of Sale Devices (PoS)	Interface: Wi-Fi	
		Frequency Range ETSI EN 301 893 Clause 5.4.2 (For Conducting testing only)	TEC ER No. TEC17672301
		Occupied Channel Bandwidth/20 dB Bandwidth ETSI EN 301 893 Clause 5.4.3.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		RF Output Power ETSI EN 301 893 Clause 5.4.4.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
		Peak Power Spectral Density ETSI EN 301 893 Clause 5.4.4.2.1.3 (For Conducting testing only)	TEC ER No. TEC17672301
		Transmitter unwanted emissions outside the 5 GHz RLAN bands ETSI EN 301 893 Clause 5.4.5.2.1 (For Conducting testing only)	TEC ER No. TEC17672301

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SCOPE OF DESIGNATION
(Annexure)

Laboratory Name: M/s Sunren Telecom Laboratory, Mumbai
(A Division of M/s Sunren Technical Solutions Pvt. Ltd.)
C-475 TTC Industrial Area Pawane, MIDC Navi Mumbai,
Maharashtra-400705

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Point of Sale Devices (PoS)	Interface: Wi-Fi	Receiver Spurious emissions ETSI EN 301 893 Clause 5.4.7.1, 5.4.7.2.1 (For Conducting testing only)	TEC ER No. TEC17672301
12.	Modem (V.90/V92/ V21 to V34 Modem)	Parameters linked to product variants	Over Voltage Current Protection ITU-T K.21 Annex-D	TEC ER No. TEC16632108
			Modem Receiver Signal V.34 (para 6.6) Annex-D	TEC ER No. TEC16632108
			Modem Transmit Power T.4 (-3dBm to -15 dBm) Annex-D	TEC ER No. TEC16632108
		Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D	TEC ER No. TEC16632108
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC16632108
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC16632108
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	TEC ER No. TEC16632108
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC16632108

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	Modem (V.90/ V92/ V21 to V34 Modem)	Interface: ISDN BRI Layer-III BRI Specification - Call Clearing ITU-T Q.931 Clause No. 3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC16632108	
		Layer-III BRI Specification - Call Setup ITU-T Q.931 Clause No.3.1.1, 3.1.2, 3.1.3, 3.1.14, 3.1.15, 3.1.5, 3.1.9, 3.1.10, 4.5.5, 4.5.8, 4.5.10, 4.5.13, Table 6-5 for all call clearing message	TEC ER No. TEC16632108	
13.	G3 Fax Machine	Parameters Linked with Product Variant	Acoustic Shock Absorption P.360 Annex-D	TEC ER No. TEC13292108
			Over voltage and Over Current Protection on 2W ITU-T K.21 Annex-D	TEC ER No. TEC13292108
			Receiver Sensitivity for FAX T.4 Clause 7 Annex-D	TEC ER No. TEC13292108
			Transmit Power Fax Machine T.4 Clause 6 Annex-D	TEC ER No. TEC13292108

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	G3 Fax Machine	Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D	TEC ER No. TEC13292108
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC13292108
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC13292108
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	TEC ER No. TEC13292108
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC13292108
14.	Cordless Telephone	Parameters linked to Product variant	Acoustic Shock Absorption P.360 Annex-D	TEC ER No. TEC12672301
			Over voltage and Over Current Protection on 2W ITU-T K.21 Annex-D	TEC ER No. TEC12672301
			EIRP for Cordless Telephone WPC GSR Annex- D2	TEC ER No. TEC12672301
			Frequency band for Cordless Telephone WPC GSR Annex-D2	TEC ER No. TEC12672301

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	Cordless Telephone	Parameters linked to Product variant	Spurious Emissions for Cordless Telephone Annexure- D2
			TEC ER No. TEC12672301
			Transmit Power for Cordless Telephone Annexure- D2
			TEC ER No. TEC12672301
		Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D
			TEC ER No. TEC12672301
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D
			TEC ER No. TEC12672301
		Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	
		TEC ER No. TEC12672301	
		Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	
		TEC ER No. TEC12672301	
		Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	
		TEC ER No. TEC12672301	

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
15.	Conferencing Equipment	Parameters Linked with Product Variant	Voice Conference Verification (Functional Test) Annex-D	TEC ER No. TEC12662108
		Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D	TEC ER No. TEC12662108
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC12662108
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC12662108
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	TEC ER No. TEC12662108
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC12662108

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
16.	PON Family of Broadband Equipment	Parameters Linked with Product Variant	
		MAC Address Limitation in PON IEEE 802.3 Annex-J3 (For GPON interface based PON OLT only)	TEC ER No. TEC14762401
		Password based authentication in PON ITU-T G.984.3 Section 9.2.2 12 Annex-J3	TEC ER No. TEC14762401
		Frame loss of PON RFC 2544 Annex-J3 (For GPON interface based PON OLT only)	TEC ER No. TEC14762401
		Latency of PON RFC 2544 Annex-J3 (For GPON interface based PON OLT only)	TEC ER No. TEC14762401
		MAC address learning and Aging control G.984.1 Annex-J3	TEC ER No. TEC14762401
		Over Voltage and Over Current Protection on 2W ITU-T K.21 Annex-D	TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	PON Family of Broadband Equipment	Interface: 2 Wire	Idle State Current for 2 wire Int. ETSI EN 300 001 ETSI TBR-21 Cl. 4.4.1 Annex-D	TEC ER No. TEC14762401
			Insulation Test for 2 wire Int. ETSI EN 300 001 Annex-D	TEC ER No. TEC14762401
			Longitudinal Conversion Loss for 2W Int. Q.552 Cl. 2.2.2 Annex-D	TEC ER No. TEC14762401
			Maximum Loop Current for 2W Int. ETSI EN 300 001 ETSI TBR-21 Cl.4.4.3 Annex-D	TEC ER No. TEC14762401
			Return Loss for 2W Int. Q.552 Cl. 2.2.1.2 Annex-D	TEC ER No. TEC14762401
		Interface: 1G Optical Ethernet	Average Launch Power IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC14762401
			Receiver Sensitivity IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC14762401
			Wavelength IEEE 802.3z Cl. 38 Annex-H	TEC ER No. TEC14762401
		Interface: 10/100/1000 BASE-T Ethernet	Link Speed and Auto negotiation Test GE IEEE 802.3 Annex-H	TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	PON Family of Broadband Equipment	Interface: 10/100 BASE-T Ethernet	Link Speed and Auto negotiation Test FE IEEE 802.3 Annex-H TEC ER No. TEC14762401
		Interface: 10 BASE-T Ethernet	Link Speed IEEE 802.3 Annex-H TEC ER No. TEC14762401
		Interface: 10G Optical Ethernet	Average Launch Power IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC14762401
			Receiver Sensitivity IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC14762401
			Wavelength IEEE 802.3ae Cl. 52 Annex-H TEC ER No. TEC14762401
		Interface: 2 Mbps-E1	Input Jitter Tolerance ITU-T G.823 ETSI TBR-4 Annex-I TEC ER No. TEC14762401
			Input Return Loss ITU-T G.703 Annex-I TEC ER No. TEC14762401
			Nominal Bit Rate with Tolerance ITU-T G.703 Annex-I TEC ER No. TEC14762401
			Output Jitter ITU-T G.823 Annex-I TEC ER No. TEC14762401
			Pulse Mask ITU-T G.703 Annex-I TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	PON Family of Broadband Equipment	Interface: STM-1 Optical	Input Jitter Tolerance ITU-T G.825 Annex-K	TEC ER No. TEC14762401
			Mean Launched Power ITU-T G.957 Annex-K	TEC ER No. TEC14762401
			Nominal Bit Rate with Tolerance ITU-T G.957 Annex-K	TEC ER No. TEC14762401
			Operating Wavelength Range ITU-T G.957 Annex-K	TEC ER No. TEC14762401
			Output Jitter ITU-T G.783 Annex-K	TEC ER No. TEC14762401
			Receiver Overload ITU-T G.957 Annex-K	TEC ER No. TEC14762401
			Receiver Sensitivity ITU-T G.957 Annex-K	TEC ER No. TEC14762401
		Interface: Wi-Fi	RF Output Power ETSI EN 300 328 Clause 5.4.2.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
			Power Spectral Density ETSI EN 300 328 Clause 5.4.3.2.1 (For Conducting testing only)	TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
	PON Family of Broadband Equipment	Interface: Wi-Fi Hopping Frequency Separation ETSI EN 300 328 Clause 5.4.5.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
		Adaptivity ETSI EN 300 328 Clause 5.4.6.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
		Occupied Channel Bandwidth/20 dB Bandwidth ETSI EN 300 328 Clause 5.4.7.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
		Transmitter unwanted emissions in the Out- of-band domain ETSI EN 300 328 Clause 5.4.8.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
		Transmitter unwanted emissions in the spurious domain ETSI EN 300 328 Clause 5.4.9.2.1 (For Conducting testing only)	TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification
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	PON Family of Broadband Equipment	Interface: Wi-Fi	Frequency Range ETSI EN 301 893 Clause 5.4.2 (For Conducting testing only)	TEC ER No. TEC14762401
			Occupied Channel Bandwidth/20 dB Bandwidth ETSI EN 301 893 Clause 5.4.3.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
			RF Output Power ETSI EN 301 893 Clause 5.4.4.2.1 (For Conducting testing only)	TEC ER No. TEC14762401
			Peak Power Spectral Density ETSI EN 301 893 Clause 5.4.4.2.1.3 (For Conducting testing only)	TEC ER No. TEC14762401
			Transmitter unwanted emissions outside the 5 GHz RLAN bands ETSI EN 301 893 Clause 5.4.5.2.1 (For Conducting testing only)	TEC ER No. TEC14762401

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Sl. No.	Telecom Equipment/Product	Test Parameter or Type of Testing	Standard/Specification	
	PON Family of Broadband Equipment	Interface: Wi-Fi	Receiver Spurious emissions ETSI EN 301 893 Clause 5.4.7.1, 5.4.7.2.1 (For Conducting testing only)	TEC ER No. TEC14762401

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