
Enhanced EVERCLEAR* Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Enhanced EVERCLEAR* Connector.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Table 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Documents

- 109-197: Test Specification (TE Test Specifications vs. EIA and IEC Test Methods)
- 501-134015: Qualification Test Report (Enhanced EVERCLEAR* Connector)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EIA-638: Surface Mount Solderability

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing

3.3. Ratings

- Voltage: 120 volts AC
- Current: 0.5 ampere maximum per contact
- Temperature: -55° to 105°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical, and environmental performance requirements specified in Table 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Table 1

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	ΔR 10 milliohms maximum for signal contacts.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Insulation resistance.	1000 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 300 volts AC at sea level. Test between adjacent contacts, signal to signal and signal to ground as applicable.
MECHANICAL		
Connector solderability.	Solderable area shall have a minimum of 95% solder coverage.	EIA-638. Subject specimens to solderability.
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 250 cycles at a maximum rate of 500 cycles per hour with latches engaged.
Plug insertion force (QSFP/QSFP+ module to PCB connector and QSFP cage).	40 N maximum without heat sink and clip. 55 N maximum with heat sink and clip.	EIA-364-13. Measure force necessary to mate specimens with latches engaged at a maximum rate of 6.35 mm per minute.

Table 1

Test Description	Requirement	Procedure
Plug extraction force (QSFP/QSFP+ module from PCB connector and QSFP cage).	30 N maximum without heat sink and clip. 45 N maximum with heat sink and clip.	EIA-364-13. Measure force necessary to unmate specimens with latches disengaged at a maximum rate of 6.35 mm per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition VII. Subject mated specimens to 10 cycles between -55° and 85°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A. Subject mated specimens to 90°C for 840 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Subject board mounted specimens to environmental Class IIA for 14 days. One-half of the specimens (receptacle only) unmated for 7 days followed by 7 days mated. The remaining one-half of the specimens mated for 14 days.
Thermal cycling.	See Note.	EIA-364-10, Condition A. Subject mated and board mounted specimens to 10 temperature cycles between 15° ±3°C and 85° ±3°C as measured on the specimen. Ramp times shall be a minimum of 2°C per minute with dwell times long enough to ensure contacts reach the temperature extremes (5 minutes minimum). Humidity not controlled.
Dust.	See Note.	EIA-364-91. Subject unmated specimens to dust composition #1 for 1 hour.
Temperature life, preconditioning.	See Note.	EIA-364-17, Method A. Subject mated specimens to 90°C for 360 hours.
Minute disturbance.	See Note.	Manually unmate and remate the specimen 1 time.

NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Table 2.

3.6. Product Qualification and Requalification Test Sequence

Table 2

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Initial examination of product	1	1	1	1	1	1
LLCR	3,7	2,4,6,8	2,4,6,8			2,4,6,8
Insulation resistance				2,6		
Withstanding voltage				3,7		
Connector solderability					2	
Random vibration	5					
Mechanical shock	6					
Durability	4(c)					
Plug insertion force	2					
Plug extraction force	8					
Thermal shock				4(d)(e)		
Humidity/temperature cycling		7		5		
Temperature life		3(d)(e)				
Mixed flowing gas			5			
Thermal cycling						5
Dust						3(d)
Temperature life, preconditioning			3(d)(e)			
Minute disturbance		5	7			7
Final examination of product	9	9	9	8	3	9

NOTE

- (a) See Paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Latches engaged
- (d) Precondition specimens with 20 durability cycles with latches engaged.
- (e) Mated to blank transceivers.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. Each test group shall consist of a minimum of 5 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Table 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Table 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.