

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

QSFP-OTB cage and cable mounted receptacle

1. SCOPE

1.1. Content

This specification defines performance, test and quality requirements for the QSFP-OTB cage and cable mounted receptacle.

1.2. Qualification

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

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 21 November 2019. The Qualification Test Report number is 501-130016. This documentation is available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-130018: Application Specification
- 501-130016: Qualification Test Report

2.2. Industry Documents

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications
- J-STD-002 Surface Mount Solderability

2.3. Reference Document

- [109-197](#) Test Specification (TE Test Specification vs EIA and IEC Test Methods)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Ratings

Voltage	Current	Temperature
30 VDC	Signal application only	-55 to 105°C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Initial examination of product	Meets requirements of product drawing.	EIA-364-18. Visual examination and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual examination.
ELECTRICAL		
Low Level Contact Resistance (LLCR)	ΔR 20 m Ω maximum	EIA-364-23. Max. open voltage 20mV. Max current 100 mA DC. All contacts to be measured.
Insulation resistance	1000 M Ω minimum	EIA-364-21. Test voltage 100V DC. Duration: 1 minute. Measure between adjacent signal contacts.
Withstanding voltage	No breakdown or flashover.	EIA-364-20, Condition I. Test voltage: 300 volts AC at sea level. Test between adjacent contacts, signal to signal and signal to ground
MECHANICAL		
Random vibration	No discontinuity $\geq$ 1 microsecond See Note.	EIA-364-28, Test Condition VII, Test Condition Letter D. Subject mated specimens to 3.10 G RMS between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock	No discontinuity $\geq$ 1 microsecond See Note.	EIA-364-27, Test Condition H. Subject mated specimens to 30 Gs half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Connector Durability	See Note.	EIA-364-9. Mate and unmate specimens. Disable latch. Operation cycles: 250. Rate: max 6.35 mm/minute
Cage Durability	See Note.	EIA-364-9. Manually mate and unmate the QSFP module for 100 cycles with latches enabled.
Cage latch, axial retention	125 N [28.09 lbf] minimum. See Note.	EIA 364-98. Measure force necessary to remove QSFP module from cage assembly with latches enabled.
Mating force, QSFP module to QSFP-OTB cage and connector	40 N [8.99 lbf] maximum. See Note.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [0.5 in] per minute.
Unmating force, QSFP module to QSFP-OTB cage and connector	30 N [6.74 lbf] maximum. See Note.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [0.5 in] per minute with latches disabled.
Cage compliant pin insertion force	54 N [12.14 lbf] maximum average per pin. See Note.	EIA-364-5. Measure force necessary to push cage into the host board at a maximum rate of 12.7 mm [0.5 in] per minute.
Cage compliant pin retention force	8 N [1.80 lbf] minimum average per pin. See Note.	EIA-364-29. Measure force necessary to remove cage from the host board at a maximum rate of 12.7 mm [0.5 in] per minute.

Figure 1 Cont.

Receptacle latch durability	See Note.	Manually mate, latch, unlatch and unmate the receptacle to the cage 20 times with no QSFP module.
Receptacle latch, axial retention	44 N [9.89 lbf] minimum. See Note.	With QSFP module unmated, axially pull on receptacle to 44 N and hold for 5 seconds.
Receptacle latch, lateral retention	44 N [9.89 lbf] minimum. See Note.	With QSFP module unmated, apply 44 N perpendicular to the mating axis in both directions parallel to the board and perpendicular to the board. Hold for 5 seconds in each direction.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Method A, Test Condition I. Subject mated specimens to 5 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 IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH. No preconditioning.
Temperature life.	See Note.	EIA-364-17, Method A, Test Subject mated specimens to 105°C for 250 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-364-110, 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 > 2°C per minute with dwell times long enough to ensure contacts reach the temperature extremes (5 minutes minimum). Humidity not controlled.
Minute disturbance	See Note.	Manually unmate and mate the specimen 5 times.


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 Figure 2.

Figure 1 end

3.4. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Initial examination of product	1	1	1	1	1	1	1
Low Level Contact Resistance	3,5,9	3,6	3,6,9				3,8
Insulation resistance				2,6			
Withstanding voltage				3,7			
Random vibration	6						
Mechanical shock	7						
Connector Durability	4(c)						
Cage Durability					5		
Catch latch, axial retention					6		
Mating force, QSFP module to QSFP-OTB cage and connector					3		
Unmating force, QSFP module to QSFP-OTB cage and connector					4		
Cage compliant pin insertion force					2	2	
Cage compliant pin retention force						4	
Receptacle latch durability							4
Receptacle latch, axial retention							5
Receptacle latch, lateral retention							6
Thermal shock				4			
Humidity/temperature cycling				5			
Temperature life		4				3	
Mixed flowing gas			4				
Thermal cycling			7				
Minute disturbance	2,8	2,5	2,5,8				2,7
Final examination of product	10	7	10	8	7	5	9



NOTE

- Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production. Unless otherwise stated all test groups shall consist of a minimum of 5 connectors of which all contacts shall be tested.
- Numbers indicate sequence in which tests are performed.
- 245 cycles

4. QUALITY ASSURANCE PROVISIONS

4.1. Acceptance

Acceptance is based upon verification that product meets requirements of Paragraph 3.3. Failures attributed to equipment, test set-up, applied customer components or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken, and samples resubmitted for requalification. Testing to confirm corrective action is required before resubmittal.

4.2. Requalification Testing

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