



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.

## Quad Small Form-Factor Double Density (QSFP-DD) 56-Gbps

### Copper Module Direct Attach Cable Assembly

#### 1. SCOPE

##### 1.1. Content

This specification defines performance, tests and quality requirements for the QSFP Double Density 56-Gbps direct attach cable assembly.

##### 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.

##### 1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number for this testing is 501-60087.

#### 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. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the reference documents, this specification shall take precedence.

##### 2.1. TE Documents

- 108-130016 Product Specification (QSFP-DD SMT Connector)
- 114-130007 Application Spec (QSFP-DD Connector)
- 108-60122 Product Spec (QSFP-DD Cage)
- 501-60087: Qualification Test Report (QSFP-DD Serial Cable Assembly)

##### 2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- SFF-8417: Multi Conductor Cable Flex Cycle Life Test Procedure

##### 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
3.3 V DC	0.75A per contact (signal application only)	-10°C to 60°C

### 3.3. Performance and Test Description

The product is designed to meet electrical, mechanical and environmental performance specified in this paragraph as tested per test sequence specified in Paragraph 3.5.

### 3.4. 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.
<b>ELECTRICAL</b>		
High Speed Test	Per IEEE802.3cd	EIA 364-108
<b>MECHANICAL</b>		
Cable Flex	Passing Signal Integrity Testing. See Note	SFF-8417, Type C According to 6.2.2. Mandrel radius to be 7 times the maximum cable diameter.
Axial Cable Retention	No evidence of damage or cable pull out from connector. Passing Signal Integrity Testing. See Note.	EIA-364-38 Method A Secure module and apply 90 N of axial force to cable for 5 minutes.
Module Retention	No module damage when 90 N extraction force is applied.	EIA-364-13 Apply 90 N to cable module with latches enabled.
Durability	Passing Signal Integrity Testing and no contact damage after 50 mating cycles.	Engage and disengage the QSFP-DD module pull tab with the receptacle and cage 50 times.
<b>ENVIRONMENTAL</b>		
Humidity Cycle Test	Passing Signal Integrity Testing. See Note(a)	Cable specimens are tested uncoiled for initial SI at 25°C then specimens coiled (9" coil for 32/30AWG and 15" for 28AWG) and are exposed to 30°C/90% relative humidity for 20 hours. Cable specimens are tested coiled for final SI at 25°C.
Long term stability test	See Note(a)(b)	Cable specimens are tested uncoiled for initial SI then coiled (9" coil for 32/30AWG and 15" coil for 28AWG) and tested per note(b) "Accelerated

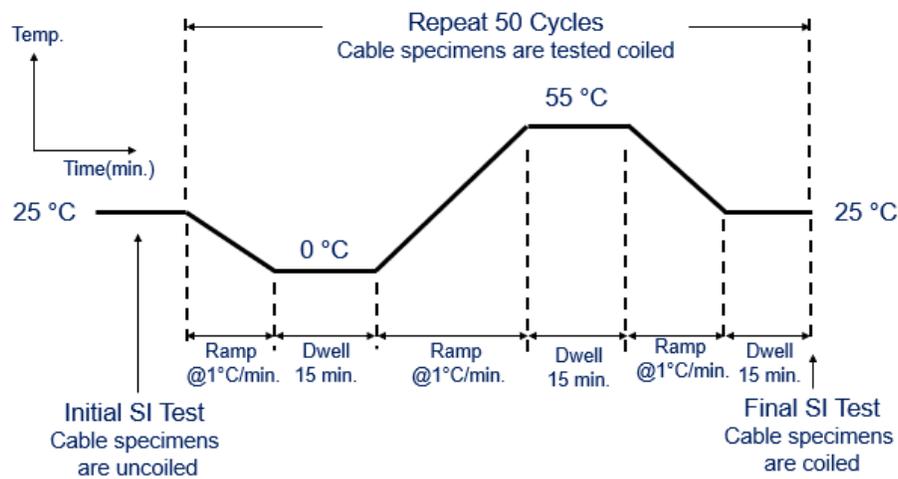
		Long Term Test Profile". Cable specimens are tested coiled for final SI.
3 Cycle Temperature test	See Note(a)(c)	Cable specimens are tested uncoiled for initial SI then cable coiled (9" coil for 32/30AWG and 15" for 28AWG) and tested per note(c) "Temperature profile". Cable specimens are tested coiled for final SI.

**Table 1 End**

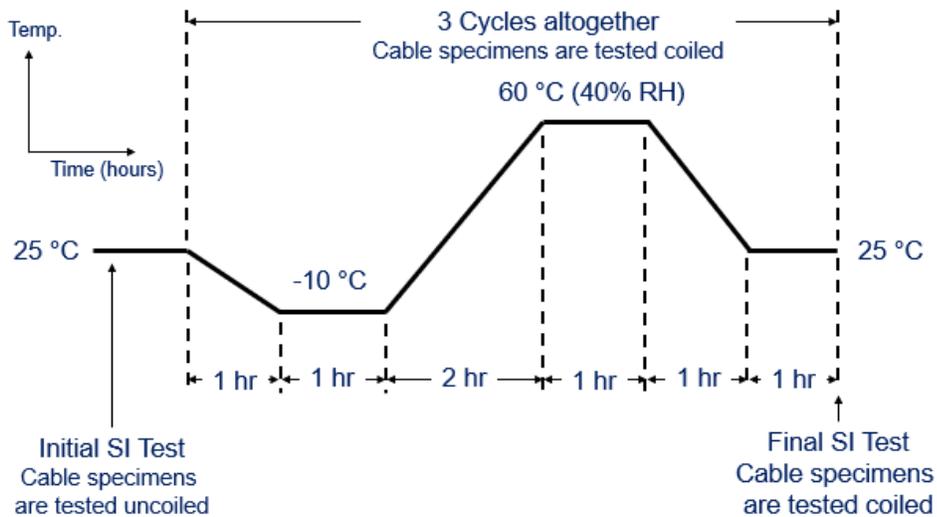
**NOTE**

(a) 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.

(b) Accelerated Long Term Test Profile.



(c) Temperature Profile.



### 3.5. Product Qualification and Re-Qualification 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
High-Speed Test	2,4	2,4	2,4	2,5	2,4	
Humidity	3					
Cable Flex					3	
Axial Cable Retention				4		
Module Retention						3
Long term stability test		3				
3 Cycle Temperature test			3			
Durability				3		2
Final Examination of Product	5	5	5	6	5	4



**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.

**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.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Paragraph 3.5.

4.2. Re-Qualification Testing

If changes that significantly affecting form, fit, or function are made to the product or manufacturing process, product assurance shall coordinate re-qualification 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 Paragraph 3.4. 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 re-submitted 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.