

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

Copper Module Direct Attach Cable Assembly

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) Quad Small Form-Factor Double Density 56-Gbps Copper Module Direct Attach cable assembly to determine their conformance to the requirements of Product Specification 108-130017.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of Quad Small Form-Factor Double Density 56-Gbps Copper Module Direct Attach cable assembly. Testing was performed at TE Product Testing Laboratory between 25Mar 2019 and 25Jun 2019.

1.3. Conclusion

The Quad Small Form-Factor Double Density 56-Gbps Copper Module Direct Attach cable assembly listed in paragraph 1.5, conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-130017 Revision A.

1.4. Product Description

TE Connectivity (TE) Quad Small Form-Factor Double Density 56-Gbps Copper Module Direct Attach cable assembly are designed to meet requirements for applications such as servers, storage and switches equipment.

1.5. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1,2,3	3 each	2337908-1	QDD to QDD 30awg 1m cable assembly
	3 each	2337908-2	QDD to QDD 28awg 2m cable assembly
	3 each	2337908-3	QDD to QDD 28awg 2.5m cable assembly
	3 each	2323765-1	QDD to QDD 32awg 0.5m cable assembly
	3 each	2323766-3	QDD to QDD 30awg 1.5m cable assembly
	3 each	2821992-1	QDD to 4QSFP 32awg 0.5m cable assembly
	3 each	2821993-3	QDD to 4QSFP 30awg 1.5m cable assembly
	3 each	2821994-3	QDD to 4QSFP 28awg 2.0m cable assembly
	3 each	2821994-4	QDD to 4QSFP 28awg 2.5m cable assembly
	3 each	2327687-1	QDD to 8SFP 32awg 0.5m cable assembly
	3 each	2327688-3	QDD to 8SFP 30awg 1.5m cable assembly
	3 each	2327689-3	QDD to 8SFP 28awg 2.0m cable assembly
	3 each	2327689-4	QDD to 8SFP 28awg 2.5m cable assembly
		6	NA
	9	NA	QDD Cirris test board
4	3	2337908-1	QDD to QDD 30awg 1m cable assembly
	3	2337908-2	QDD to QDD 28awg 2m cable assembly
	3	2337908-3	QDD to QDD 28awg 2.5m cable assembly
	3	2337908-1	QDD to QDD 30awg 1m cable assembly

	3	2821993-2	QDD to 4QSFP 30awg 1.0m cable assembly
	3	2821994-4	QDD to 4QSFP 28awg 2.5m cable assembly
	3	2327688-2	QDD to 8SFP 30awg 1.0m cable assembly
	3	2327689-4	QDD to 8SFP 28awg 2.5m cable assembly
	6	NA	QDD SI test board
	3	NA	QDD Cirris test board
5	3	2337908-1	QDD to QDD 30awg 1m cable assembly
	3	2337908-3	QDD to QDD 28awg 2.5m cable assembly
	3	2323765-2	QDD to QDD 32awg 0.5m cable assembly
	3	2323766-3	QDD to QDD 30awg 1.5m cable assembly
	3	2821992-2	QDD to 4QSFP 32awg 1.0m cable assembly
	3	2821993-3	QDD to 4QSFP 30awg 1.5m cable assembly
	3	2821994-4	QDD to 4QSFP 28awg 2.5m cable assembly
	3	2327687-2	QDD to 8SFP 32awg 1.0m cable assembly
	3	2327688-3	QDD to 8SFP 30awg 1.5m cable assembly
	3	2327689-4	QDD to 8SFP 28awg 2.5m cable assembly
6	6	NA	QDD SI test board
	5	2337908-3	QDD to QDD 28awg pigtail
	5	NA	QDD Cirris test board

Figure 1

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 25 to 75% RH

1.7. Qualification Test Sequence

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, IEEE802.3 cd	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.

Figure 2

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. They were inspected and accepted by the Quality Assurance Department.

2.2. Hight speed test - Test Groups 1, 2, 3, 4 and 5

All test specimens pass IEEE 802.3 cd spec.

2.3. Humidity test– Test Group 1

No evidence of physical damage was visible as a result of humidity cycling.

2.4. Long term stability test – Test Group 2

No evidence of physical damage was visible as a result of long term stability test.

2.5. 3 Cycle Temperature test – Test Group 3

No evidence of physical damage was visible as a result of 3 cycle temperature test.

2.6. Durability - Test Group 4

No physical damage occurred as a result of mating and un-mating the specimens 50 cycles.

2.7. Axial Cable Retention – Test Group 4

Cable meet the force of 90N with 5 minutes.

2.8. Cable flex - Test Group 5

No physical damage occurred as a result during flex cable.

2.9. Module retention in cage - Test Group 6

All module retention in cage measurements were greater than 90N with no evidence of physical damage.

2.10 Final Examination of Product - All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3. TEST METHODS

3.1. Initial Examination of Product

A Certificate of Conformance was issued stating that all specimens in this test package were produced, inspected, and accepted as conforming to product drawing requirements, and were manufactured using the same core manufacturing processes and technologies as production parts.

3.2. High speed test

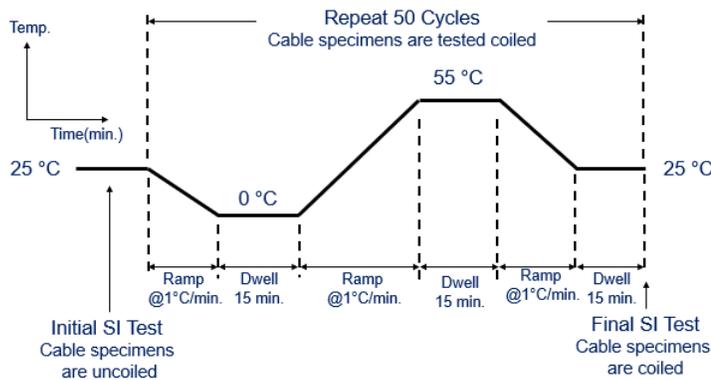
- Differential Insertion Loss;
- Differential to Common Mode Return Loss;
- Differential to Common Mode Conversion Loss;
- Common mode to Common mode Return Loss;

3.3. Humidity test

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.

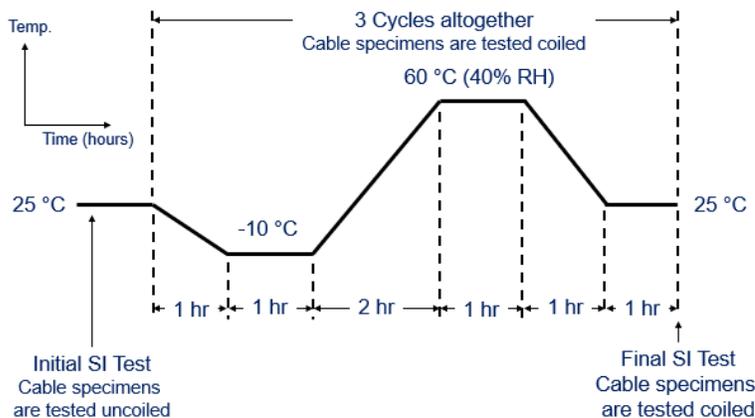
3.4. Long term stability test

Cable specimens are tested uncoiled for initial SI then coiled (9" coil for 30AWG and 15" coil for 28AWG) and tested per "Accelerated Long Term Test Profile". Cable specimens are tested coiled for final SI.



3.5. 3 Cycle Temperature test

Cable specimens are tested uncoiled for initial SI then cable coiled (9" coil for 30AWG and 15" for 28AWG) and tested per note(c) "Temperature profile". Cable specimens are tested coiled for final SI.



3.6. Durability

Manually mate and un-mate the QSFP-DD module to the cage connector interface for 50 cycles with latches enabled.

3.7. Axial Cable Retention

EIA-364-38 Method A, secure module and apply 90 N of axial force to cable for 5 minutes.



3.8. Cable flex

SFF-8417, Type C According to 6.2.2. Flex cable $\pm 90^\circ$ for 200cycles, Mandrel radius to be 7 times the maximum cable diameter.



3.9. Module retention in cage

EIA-364-13, apply 90N to cable module with latch enabled.

3.10. Final Examination of Product

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.