SFP Double Density SFP-DD 1XN Cage

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) SFP Double Density 1XN Cage to determine its conformance to the requirements of Product Specification 108-60128 Rev B.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of 1XN CAGE. Testing was performed at the Shang Hai Electrical Components Test Laboratory between 09APR20 and 09OCT20. The test file number for this testing is TP-20-00510 and TP-20-01049 for 1X4 cage, TP-20-01239 for 1X1 cage,TP-20-02237 for 1x6 cage. This documentation is on file at and available from the Shang Hai Electrical Components Test Laboratory.

1.3. Conclusion

SFP Double Density 1XN specimens listed in paragraph 1.4, conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-60128 Revision B.

1.4. Test Specimens

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

Table 1

Quantity	Part Number	Description
20	2356208-1	1X4 SFP-DD CAGE with Heatsink and Light pipe
5	2359845-1	1X1 SFP-DD CAGE with Heatsink for group 3
5	2347717-1	CAGE ASSEMBLY W/ LP HS, SFP-DD 1X6 for group 3
20	2325864-2	SFP-DD PT CONNECTOR
15	XXXXXX	TE Cable assembly SFP-DD dummy module
15	60-1949822	Test PCB

1.5. Environmental Conditions

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

Temperature: 15 to 35°C
Relative Humidity: 20 to 80%

1.6. Qualification Test Sequence

Table 2

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Durability	4			
Mating force	2,5			
Un-mating force	3,6			
Rotational cable pull	7			
Cage Latch Strength				3
Temperature life(Precondition)				2(c)(d)
Salt Spray		2		
Compliant pin insertion force			2	
Compliant pin retention force			3	
Final examination of product	8	3	4	4

NOTE

a. See paragraph 2.1.

b. Numbers indicate sequence in which tests are performed.

c. Precondition specimens with 20 durability cycles with latches engaged.

d. Mated to blank transceivers (no components added to cable connector PCB)

2. SUMMARY OF TESTING

2.1. Initial Examination of Product - All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance (C of C) was issued by Product Assurance. Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

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2.2. Durability - Test Group 1

No evidence of physical damage detrimental to product performance was visible as a result of mating and un-mating the specimens with the cage latches engaged 100 times.

2.3. Transceiver Mating Force - Test Group 1

All transceiver mating force measurements were less than 40 N when mate cable plug into Cage with Connector.

Table 3

Test Item	Condition	Test Result			
		Max	Min	Ave	Unit
Mating force	Initial	22. 7	19. 2	20. 45	N
Mating force	Final	29.3	14. 9	23. 0	N

2.4. Transceiver Un-mating Force - Test Group 1

All transceiver un-mating force measurements were less than 30 N when un-mate cable plug from Cage with connector by pulling at latching release feature.

Table 4

Test Item	Condition	Test Result			
		Max	Min	Ave	Unit
Un-mating force	Initial	18. 2	15. 9	16. 9	N
Un-mating force	Final	14. 2	3. 5	7. 0	N

2.5. Rotational Cable Pull - Test Group 1

There was no displacement of the cage assembly or connector from the PCB when subjected to a minimum load of 33.4 N

2.6. Salt Spray - Test Group 2

It’s difficult to detect the corrosion by camera and naked eyes.

2.7. Press-fit Insertion Force - Test Group 3

Total press-fit insertion force measurements were less than 1000N for 1X6 cage.

Total press-fit insertion force measurements were less than 667N for 1X4 cage.

Total press-fit insertion force measurements were less than 300N for 1X1 cage.

Table 5

Test Item	Test Result			
	Max	Min	Ave	Unit
Total compliant pin insertion force (1X4 cage)	336.1	327.3	333.0	N
Total compliant pin insertion force (1X1 cage)	272.8	177.1	225.4	N
Total compliant pin insertion force (1X6 cage)	648.3	562.5	606.4	N

2.9. Press-fit Extraction Force - Test Group 3

Total press-fit extraction force measurements were greater than 300N for 1X6 cage

Total press-fit extraction force measurements were greater than 150N for 1X4 cage

Total press-fit extraction force measurements were greater than 100N for 1X1 cage

Table 6

Test Item	Test Result			
	Max	Min	Ave	Unit
Total compliant pin Extraction force (1X4 cage)	206.6	158.8	179.2	N
Total compliant pin Extraction force (1X1 cage)	140.2	106.7	125.0	N
Total compliant pin Extraction force (1X6 cage)	394.4	318.9	357.0	N

2.10. Temperature life, Preconditioning - Test Group 4

No evidence of physical damage detrimental to product performance was visible as a result of temperature life, preconditioning testing.

2.11. Cage Latch Strength - Test Group 4

All cage latch strength measurements were greater than 91.2 N minimum, No physical damage was found after test.

2.12. 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 C of C 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. Durability

Specimens were mated and unmated 100 times with the cage latch operable at a maximum rate of 300 cycles per hour.

3.3. Transceiver Mating Force

The force required to mate individual specimens with the latch engaged was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.4. Transceiver Un-mating Force

The force required to un-mate individual specimens with the latch engaged was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.5. Module Retention force

Load cable module into connector with cage assembly applied to PCB with attached bezel. Apply specified axial load to engaged module at a maximum rate of 6.35 mm [.25 inch] per minute and hold 1 minute to very module retention and cag latch strength.

3.6. Rotational Cable Pull

Load cable module into connector with cage assembly applied to PCB with attached bezel. Rotate cable 40 degrees toward PCB, and then rotate 360 degrees with the load still applied.

3.7. Salt Spray

Subject was inserted to 5% salt concentration for 48 hours.

3.8. Press-fit Insertion Force

The force required to mate individual specimens into a printed circuit board was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.9. Press-fit Extraction Force

The force required to extract individual specimens from a printed circuit board was measured using a tensile/compression device with a free floating fixture and a rate of travel of 12.7 mm [.5 in] per minute.

3.10. Temperature Life, Preconditioning

Mated specimens were exposed to a temperature of 105°C for 72 hours. Specimens were preconditioned with 20 cycles of durability.

NOTE *Due to the temperature rating of the cable, dummy plugs were substituted for the plug assembly.*

3.11. Cage Latch Strength

Measure fore necessary to remove module from cage assembly with latches enabled.

3.12. Final Examination of Product

Specimens were visually examined for evidence of physical damage detrimental to product performance.