Product Specification

3M™ Cable Assemblies for QSFP+ FDR Applications, Copper

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1.0 Scope

This product specification specifies performance and quality requirements for the 3M Cable Assemblies QSFP+ FDR Applications. Signal Integrity Requirements are based on InfiniBand™ FDR SI specifications.

2.0 Applicable Documents

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

2.1 Commercial Standards for Reference Only

- SFF-8436 (latest Revision)
- EIA-364
- IBTA Vol 2(Latest Revision)

3.0 Requirements

3.1 Design and Construction

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

3.2 Materials

- Plug Housing
  See assembly DWG# 78-5100-2640-0 for dimensional details.
  Material: Nickel Plated Zinc Diecast
- Paddlecard
  DWG# 78-9101-9027-7 & 78-9101-8932-9
  Material: FR408HR or equivalent
  Mating pad underplating: Min 1.27 um Electrolytic Ni
  Mating pad finish: Min 0.76 um Electrolytic Hard Gold
- 3M™ Twin Axial Ribbon Cable
  See cable product drawing DWG#78-9101-4352-4 for dimensional details

3.3 Ratings

- Max current rating: 0.5 A/contact
- Max operating temperature: 70ºdegree C

3.4 Performance and Test Description

Product is designed to meet electrical, mechanical, SI and environmental performance requirements specified in section 3.5. All tests are performed at ambient environmental conditions per EIA-364 unless otherwise specified.

The mated boardmount connector used in these tests QSFP+ FDR right-angle connector specified in SFF-8682.

3.5 Test Requirements and Procedures Summary

Test Description	Test Condition	Requirement
MECHANICAL		
Visual Inspections & Critical Dimension Measurement	Measure dimensions specified in applicable assembly and product drawing measured per EIA-364-18	Product shall meet requirements of applicable product drawing. Products shall be free of defects such as deformation, blister, damage, crack, etc.
Durability	250 cycles Measured according to EIA-364-09	Target: Maximum delta R of 20 milliohms
Mechanical Shock	Condition: 11ms, 30g (H) peak accel. 1/2 sine wave, 3 times in X,Y,Z Measured per EIA-364-27	Target: No physical abnormalities after test. No electrical discontinuity > 1 us. Maximum delta R of 20 milliohms
Random Vibration	Condition: 20-500Hz, 3.10g RMS, 15 min duration Measured per EIA-364-28	Target: Maximum delta R of 20 milliohms
QSFP Module Extraction Force	SFF-8436	30N Max.
QSFP Module retention	SFF-8436	90N Min.
QSFP Module Insertion Force	SFF-8436	40N Max.
Pull Tab and Mechanical Metal Latch Pull Strength		No Physical damage of the Pull Tab and Mechanical Latch

Test Description	Test Condition	Requirement
ELECTRICAL		
Low Level Contact Resistance	LLCR measured before & after stress tests. Measured per EIA-364-23	Max delta R 20 milliohms after stress tests
Withstanding voltage	300 V_{DC} applied for 1 minute between adjacent signal wires, between signal wire and shield per EIA-364-20	No breakdown; Current leakage < 1 mA
Insulation resistance	300V applied for 1 minute between adjacent signal wires, between signal wire and shield per EIA-364-21	>1000 Megaohms

Test Description	Test Condition	Requirement
ENVIRONMENTAL		
Temperature Life	Condition: +85ºC - 500 hrs (1ft dia coil) Measured per EIA-364-17	Target: No visual changes. Maximum delta R of 20 milliohms
Humidity	Condition: 10 cycles / 10 days (+25ºC to +65ºC with optional cold shock -10C) (80% to 100% RH) Table 1 Cond B Method III Measured per EIA-364-31	Target: No visual changes. Maximum delta R of 20 milliohms
Thermal shock	Condition: -55C to +85ºC, 5 cycles - 1hr / cycle Measured per EIA-364-32	Target: No visual changes. Maximum delta R of 20 milliohms

Test Description	Test Condition	Requirement
SIGNAL INTEGRITY for IB		
Differential Insertion Loss, SDD21	Assembly measured over frequency range 10 MHz to 20 GHz	See IB FDR requirements. Max 15.00 dB measured at 7.03125GHz.
Insertion Loss Deviation, ILDca	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. 0.05-10.5GHz
Insertion Loss Deviation (RMS), ILDrms	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. 0.05-10.5GHz
Integrated cross-talk noise (RMS), ICN	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. 0.05-15 GHz
Differential Return Loss SDD11,SDD22	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. 0.05-15 GHz
Common mode Return Loss SCC11,SCC22	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. Min -2.0dB at 200MHz-14.1GHz.
Common mode to differential reflection SDC11,SDC22	Assembly measured from 10 MHz to 20 GHz	See IB FDR requirements. 0.05-14.1GHz.
Integrated Common Mode Conversion Noise (RMS) ICMCN	NA	See IB FDR requirements. Max 40mV .

3.5 Test Reports Summary

- 78-5102-0205-0 Product Data Sheet
- 78-5102-0206-8 Product Data Sheet for Signal integrity.

Unless otherwise noted, references to industry specifications are intended to indicate substantial compliance to the material elements of the specification. Such references should not be construed as a guarantee of compliance to all requirements in a given specification.

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