

SFP+ Passive High Speed Cable Specification

1 Description:

SFP+direct attach copper cable assembly are based on 10G Ethernet IEEE802.3ae standard , fiber channel and SFF-8431standard , and the passive SFP+ Cable is low cost alternative for short reach applications in data center cabling.

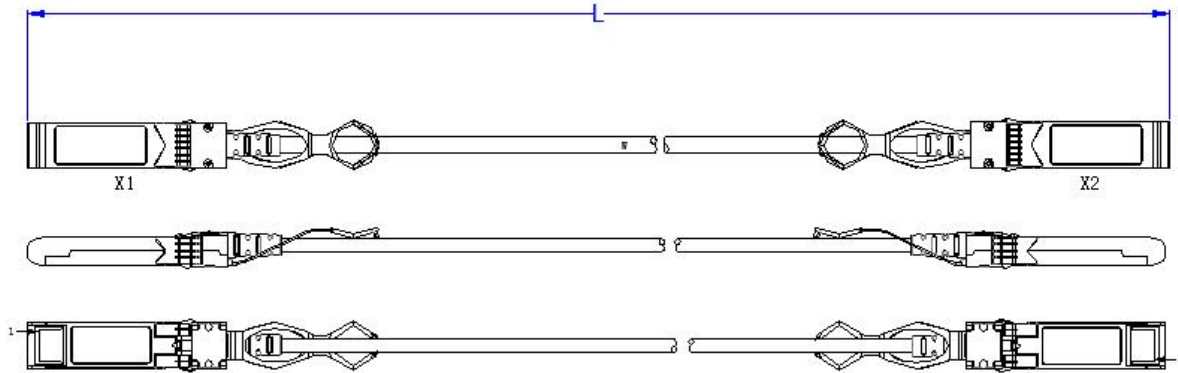
2 Features:

- Compliant to SFP+ Multi Source Agreement SFF-8432
- Compliant with IEEE 802.3ae
- Optimized NEXT & Return Loss
- Enhanced EMI / EMC performance
- Supports serial ID functionality thru EEPROM
- Passive cable assembly supports distances up to 10 meters
- 30AWG to 24AWG cable sizes available
- RoHS compliant and Halogen-Free option available

3 Applications :

- 1-8G Fiber Channel and 1-10G Gigabit Ethernet
- Hub, Switches, Routers, Servers, Network Interface Card(NICs)
- Data center cabling infrastructure
- Networking, Storage, Telecommunications

4 (Outline drawing):



5 Wiring Diagram :

Starting	End	Remark
X1. 12	X2. 19	Pair
X1. 13	X2. 18	
X1. 18	X2. 13	Pair
X1. 19	X2. 12	
X1:1, 2, 6 8, 10, 11, 14, 17, 20	X2:1, 2, 6 8, 10, 11, 14, 17, 20	Drain wire
X1:1, 4, 5 15, 16	X2:1, 4, 5 15, 16	EEPROM point at both ends

6 Electrical Performance :

6.1 Signal Integrity

(ITEM)		(REQUIREMENT)				(TEST CONDITION)
(Differential Impedance)	Cable Impedance	105+5/-5Ω				Rise time of 35ps (20% - 80%).
	Paddle Card Impedance	100±10Ω				
	Cable Termination Impedance	100±15Ω				
[Differential (Input/Output)Return loss S _{DD11} /S _{DD22}]		$Return\ loss(f) \geq \begin{cases} 10 & 0.01 \leq f < 4.1 \\ 6.3 - 13 \log_{10}(f/5.5) & 4.1 \leq f \leq 11.1 \end{cases}$ <p>Where <i>f</i> is the frequency in GHz Return loss(<i>f</i>) is the return loss at frequency <i>f</i></p>				0.01GHz ≤ <i>f</i> ≤ 11.1GHz z SFF-8431 Rev.4.1
[Differential Insertion Loss (S _{DD21} Max.)]		(Differential Insertion Loss Max.)				0.01GHz ≤ <i>f</i> ≤ 11.1GHz
F \ AWG		600MHz	1.25GHz	2.5GHz	5.0GHz	
30(1m) Max		2.5dB	3.5dB	4.5dB	6.5dB	
30(2m) Max		3.8dB	5.3dB	6.8dB	9.8dB	
30(3m) Max		5.0dB	7.0dB	9.0dB	13.0dB	
26(5m) Max		5.5dB	7.0dB	10.5dB	15.0dB	
24(10m) Max		7.0dB	10.0dB	14.0dB	20.0dB	
[MDNEXT(multiple disturber near-end crosstalk)]		≥26dB @5GHz				0.01GHz ≤ <i>f</i> ≤ 11.1GHz
[Insertion Loss Deviation]		-0.7-0.2*10 ^{-3f} ≤ ILD ≤ 0.7+0.2*10 ^{-3f} (<i>f</i> is the frequency in MHz)				0.01GHz ≤ <i>f</i> ≤ 5.0GHz

6.2 Other Electrical Performance

(ITEM)	(REQUIREMENT)	(TEST CONDITON)
[Low Level Contact Resistance]	70milliohms Max. From initial.	EIA-364-23:Apply a maximum voltage of 20mV And a current of 100 mA.
Insulation Resistance	10Mohm(Min.)	EIA364-21:AC 300V 1minute
[Dielectric Withstanding Voltage]	DC 500V 1 minute disruptive discharge.	EIA-364-20:Apply a voltage of 500 VDC for 1minute between adjacent terminals And between adjacent terminals and ground.

7 Environment Performance

(ITEM)	(REQUIREMENT)	(TEST CONDITON)
[Operating Temp. Range]	-20°C to +75°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)]	-20°C to +55°C	Cable storage temperature range in packed condition.
[Thermal Cycling Non-Powered]	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90C, 100 cycles, 15 min. dwells
[Salt Spraying]	48 hours salt spraying after shell corrosive area less than 5%.	EIA-364-26
Mixed Flowing Gas	Pass electrical tests per 3.1 after stressing. (For connector only)	EIA-364-35 Class II, 14 days.
Temp. Life	No evidence of physical damage	EIA-364-17C w/ RH, Damp heat 90°C at 85% RH for 500 hours then return to ambient
Cable Cold Bend	4H, No evidence of physical damage	Condition: -20°C±2°C, mandrel diameter is 6 times the cable diameter.

8 Mechanical and Physical Characteristics

(ITEM)	(REQUIREMENT)	(TEST CONDITON)
Vibration	Pass electrical tests per 3.1 after stressing.	Clamp & vibrate per EIA-364-28E, TC-VII, test condition letter – D, 15 minutes in X, Y & Z axis.
Cable Flex	No evidence of physical damage	Flex cable 180° for 20 cycles ($\pm 90^\circ$ from nominal position) at 12 cycles per minute with a 1.0kg load applied to the cable jacket. Flex in the boot area 90° in each direction from vertical. Per EIA-364-41C
Cable Plug Retention in Cage	90N Min. No evidence of physical damage	Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per SFF-8432 Rev 5.0
Cable Retention in Plug	90N Min. No evidence of physical damage	Cable plug is fixtured with the bulk cable hanging vertically. A 90N axial load is applied (gradually) to the cable jacket and held for 1 minute. Per EIA-364-38B
Mechanical Shock	Pass electrical tests Per 3.1 after stressing.	Clamp and shock per EIA-364-27B, TC-G,3 times in 6 directions, 100g, 6ms.
Cable Plug Insertion	18N Max.(SFP28)	Per SFF-8432 Rev 5.0
Cable plug Extraction	12.5N Max. (SFP28)	Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per SFF-8432 Rev 5.0
Durability	50 cycles, No evidence of physical damage	EIA-364-09, perform plug & unplug cycles: Plug and receptacle mate rate: 250times/hour. 50times for module (CONNECTOR TO PCB)