

# OPL-DAC-SFP+

## SFP+ Passive High Speed Cable

### Description

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

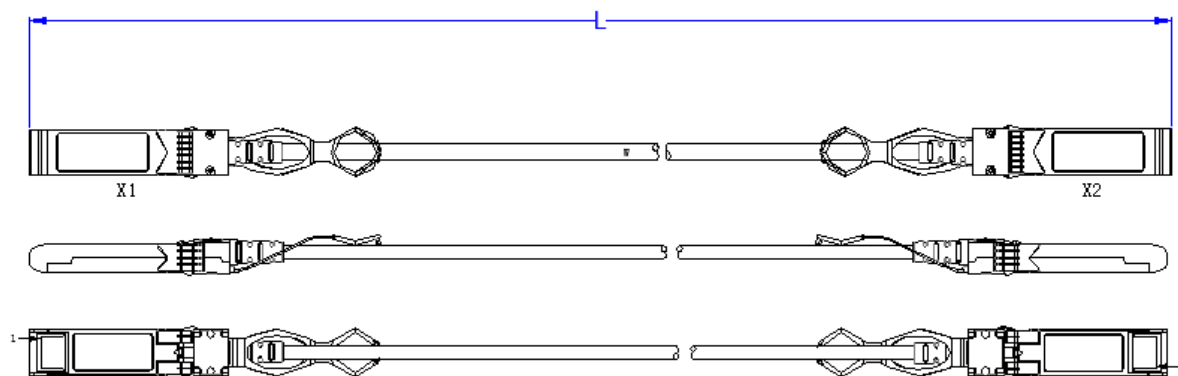
### Features

- 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

### 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

## Outline Drawing



## 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

## Electrical Performance

## 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 $S_{DD11}/S_{DD22}$ ]		$Return\ loss(f) \geq \left\{ \begin{array}{l} 10 \\ 0.01 \leq f < 4.1 \end{array} \right\}$				0.01GHz≤f≤1.1GHz SFF-8431 Rev.4.1
[Differential Insertion Loss ( $S_{DD21}$ Max.)]		(Differential Insertion Loss Max.)				0.01GHz≤f≤1.1GHz
		F AWG	600 MHz	1.25G Hz	2.5GH z	5.0GHz
		30(1m) Max	2.5d B	3.5dB	4.5dB	6.5dB
		30(2m)	3.8d	5.3dB	6.8dB	9.8dB

	Max	B				
	30(3m) Max	5.0d B	7.0dB	9.0dB	13.0dB	
	26(5m) Max	5.5d B	7.0dB	10.5dB	15.0dB	
	24(10m) ) Max	7.0d B	10.0d B	14.0dB	20.0dB	
[MDNEXT (multiple disturber near-end crosstalk)]	≥26dB @5GHz					0.01GHz≤f≤1 1.1GHz
[Insertion Loss Deviation]	-0.7-0.2*10 <sup>-3</sup> f ≤ ILD ≤ 0.7+0.2*10 <sup>-3</sup> f (f is the frequency in MHz)					0.01GHz≤f≤5 .0GHz

## 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.
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## 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.

## Mechanical and Physical Characteristics

ITEM	REQUIREMENT	TEST CONDITON
Vibration	Pass electrical tests	Clamp & vibrate per EIA-364-28E,

	per 3.1 after stressing.	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)