

## SFP56-25/50GBase-CR1-xxM-FL Quick Spec:

Part Number:	SFP56-25/50GBase-CR1-0.5M-FL SFP56-25/50GBase-CR1-1M-FL SFP56-25/50GBase-CR1-1.5M-FL SFP56-25/50GBase-CR1-2M-FL SFP56-25/50GBase-CR1-2.5M-FL SFP56-25/50GBase-CR1-3M-FL SFP56-25/50GBase-CR1-4M-FL SFP56-25/50GBase-CR1-5M-FL
Form Factor:	SFP56-SFP56
Cable Type:	Twinax (DAC)
Rate Category:	25/50GBase-25/50GBase
Length:	0.5m, 1m, 1.5m, 2m, 2.5m, 3m, 4m, 5m
Active/Passive:	Passive



## SFP56-25/50GBase-CR1-xM-FL Features

- Up to 56 GBbps bi-directional data links
- Compliant with SFF-8402, IEEE802.3.bj, IEEE802.3cd
- AC coupled inputs and outputs
- 100 Ohm differential impedance
- All-metal housing for superior EMI performance
- RoHS Compliance
- Operating case temperature range: 0 to 70 deg C

## SFP56-25/50GBase-CR1-xM-FL Applications

- 28G/56G Ethernet
- High performance computing interconnect (switch, router, concentrator, Data Center)

## Product Description

The FluxLight's SFP56-25/50GBase-CR1-xM-FL is based on the same shape of SFP+, supports 28G/56G Ethernet standard, can provide 25Gb/s NRZ and 56Gb/s PAM-4 without error code transmission, and can be applied in high-density 28G/56G Ethernet switches and network interfaces to promote server connection in data centers. It uses today's popular SFP+ packaging to provide a more cost effective solution for enterprises to upgrade their 10G Ethernet connections.

## Recommended Operating Conditions

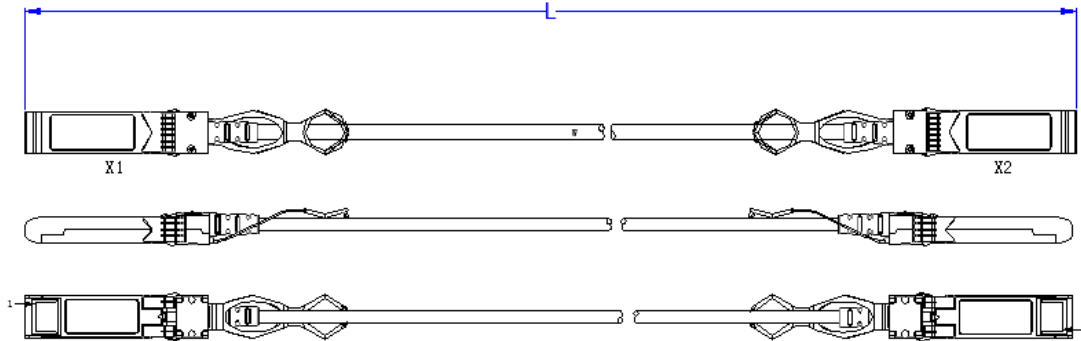
Item	Requirement	Test Condition
Operating Temp. Range	-20°C to +75°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)	-40°C to +80°C	Cable storage temperature range in packed condition.
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 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.

## Pin Assignment and Description

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	X1:1, 4, 5, 15, 16	EEPROM point at both ends

## Mechanical Dimensions

Units: nm



## 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	Force to be applied axially with no damage to cage. Per SFF 8661 Rev 2.1 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 QSFP28/SFP28 module (CONNECTOR TO PCB)

## Electrical Performance

ITEM		REQUIREMENT	(TEST CONDITION)						
(Differential Impedance)	Cable Impedance	105+5/-10Ω	Rise time of 25ps (20% - 80%).						
	Paddle Card Impedance	100±10Ω							
	Cable Termination Impedance	100±15Ω							
[Differential (Input/Output)Return loss S <sub>DD11</sub> /S <sub>DD22</sub> ]		$Return\_loss(f) \geq \begin{cases} 16.5-2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$ Where f is the frequency in GHz Return loss(f) is the return loss at frequency f	10MHz≤f≤19GHz						
[Differential to common-mode (Input/Output)Return loss S <sub>CD11</sub> /S <sub>CD22</sub> ]		$Return\_loss(f) \geq \begin{cases} 22-(20/25.78)f & 0.01 \leq f < 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$ Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f	10MHz≤f≤19GHz						
Common-mode to Common-mode (Input/Output)Return loss S <sub>CC11</sub> /S <sub>CC22</sub>		$Return\_loss(f) \geq 2\text{dB}$ $0.2 \leq f \leq 19$ Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f	10MHz≤f≤19GHz						
Differential Insertion Loss (S <sub>DD21</sub> Max.)		(Differential InsertionLoss Max. For TPa to TPb Excluding Test fixture )					10MHz≤f≤19GHz		
		F AWG \	1.25GHz	2.5GHz	5.0GHz	7.0GHz		10GHz	12.89GHz
		30(1m)Max.	4.5dB	5.4dB	6.3dB	7.5dB		8.5dB	10.5dB
		30/28(3m)Max.	7.5dB	9.5dB	12.2dB	14.8dB		18.0dB	21.5dB
		26(3m)Max.	5.7dB	7.2dB	9.9 dB	11.9dB		14.1dB	16.5dB
26/25(5m)Max.	7.8dB	10.0dB	13.5dB	16.0dB	19.0dB	22.0dB			

Differential to common-mode Conversion Loss-Differential Insertion Loss( $S_{CD21}-S_{DD21}$ )	$Conversion\_loss(f) - IL(f) \geq \begin{cases} 10 & 0.01 \leq f < 12.89 \\ 12.89 & 12.89 \leq f < 19 \end{cases}$ <p>Where <math>f</math> is the frequency in GHz  <math>Conversion\_loss(f)</math> is the cable assembly differential to common-mode conversion loss  <math>IL(f)</math> is the cable assembly insertion loss</p>	10MHz $\leq f \leq$ 19GHz
MDNEXT(multiple disturber near-end crosstalk)	$\geq 26dB @ 12.89GHz$	10MHz $\leq f \leq$ 19GHz
Intra Skew	15ps/m,	10MHz $\leq f \leq$ 19GHz
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	NO disruptive discharge.	EIA-364-20:Apply a voltage of 300 VDC for 1minute between adjacent terminals And between adjacent terminals and ground.