10Gb/s SFP+ Active Optical Cable

Features

- Support up to 10Gb/s bi-directional operation
- Available lengths (in meters): 1, 2, 3, 4, 5....
- Hot-pluggable SFP+ cable ends
- Commercial temperature range(COM): 0 to 70°C
- Low power consumption: less than 1.0 W per end
- Bend insensitive fiber
- Single 3.3V power supply
- All-metal housing for superior EMI performance
- I2C standard management interface
- Electrical interface compliant to SFF-8431
- Compliant to industrial standard SFP MSA

Applications

- 10 Gigabit Ethernet (10GbE)
- 1 / 2 / 4 / 8G Fibre Channel (1 / 2 / 4 / 8GFC), Fibre Channel
- Cost effective 10G SFP+ link solution
- System cascade applications
- System Internal data link solution
- Proprietary high speed, high density data transmission
- Switch and router high speed backplane interconnect
- High performance computing, server and data storage

Compliance

- SFP MSA
- SFF-8472
- RoHS

Description

SFP+ Active Optical Cable (AOC) assemblies use active circuits to support longer distances than standard Passive or Active SFP+ Copper Cables. They are designed for high speed, short range data link via optical fiber wire. SFP+ AOC cables provide high performance Enhanced Small Form Factor Pluggable (SFP+) interface and it is a cost effective solution for Data Center/ storage and all short range data application.

These Active Optical Cable (AOC) can be used as an alternative solution to SFP+ passive and active copper cables, while providing improved signal integrity, longer distances, superior electromagnetic immunity and better bit error rate performance.

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc	3.135		3.465	℃	
Storage Temperature	T_S	- 40		+85	°C	
Operating Humidity	RH	0		+85	%	

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Operating Case Temperature	T_C	0		+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Dissipation	Icc	-	-	300	mA	

Characteristics

Table3-Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typical	Max.	Note
Transmitter						
Output Center Wavelength	λ c	nm	840	850	860-	
Operating Data Rate	DR	Gb/s	1.06	10.3125	11.3	
Spectral width	Pm	nm	-	-	1	1
Transmitter Dispersion Penalty	TDP	dBm	-	-	3.9	
Relative Intensity Nois	Rin	dB/Hz			-128	
Extinction Ratio	ER	dB	3.5			3
Optical Return Loss Tolerance		dB			12	
Average Optical Power	Pavg-	dBm	-6.5		-1	2
Receiver						
Center Wavelength	λ r	nm	840	850	860	

Receiver Sensitivity	Psens	dBm			-11.1	4
Stressed Sensitivity in OMA		dBm			-7.5	4
Los function	Los	dBm	-30		-12	
Overload	Pin	dBm			-1	4
Receiver Reflectance		dBm			-12	

Note:

[1] Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in the table

[2] The optical power is launched into MMF

[3] Measured with a PRBS 231-1 test pattern @10.3125Gbps.

[4] Measured with a PRBS 231-1 test pattern @10.3125Gbps, BER＜10-12.

Recommended Interface

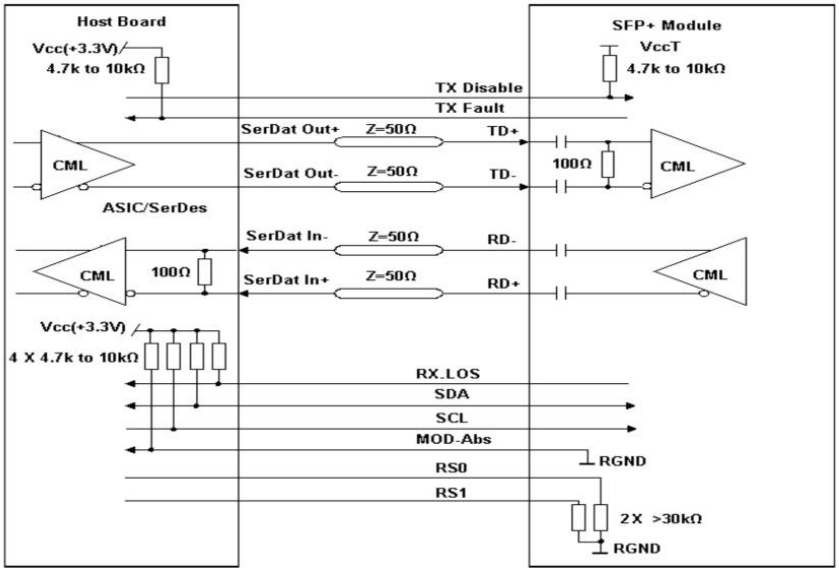


Figure 1 Recommended Interface Circuit

Pin Designation

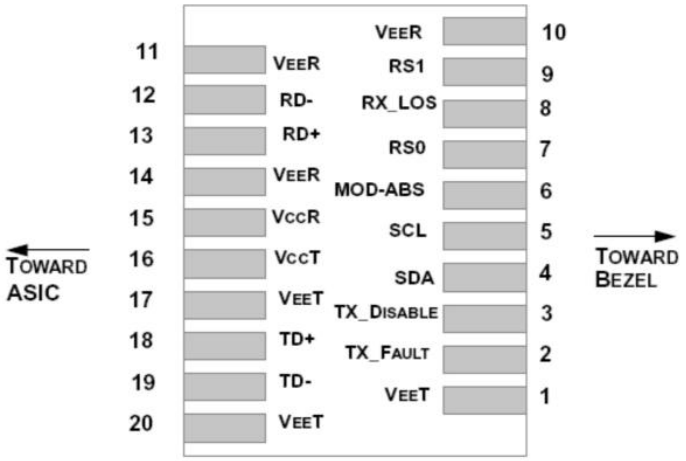


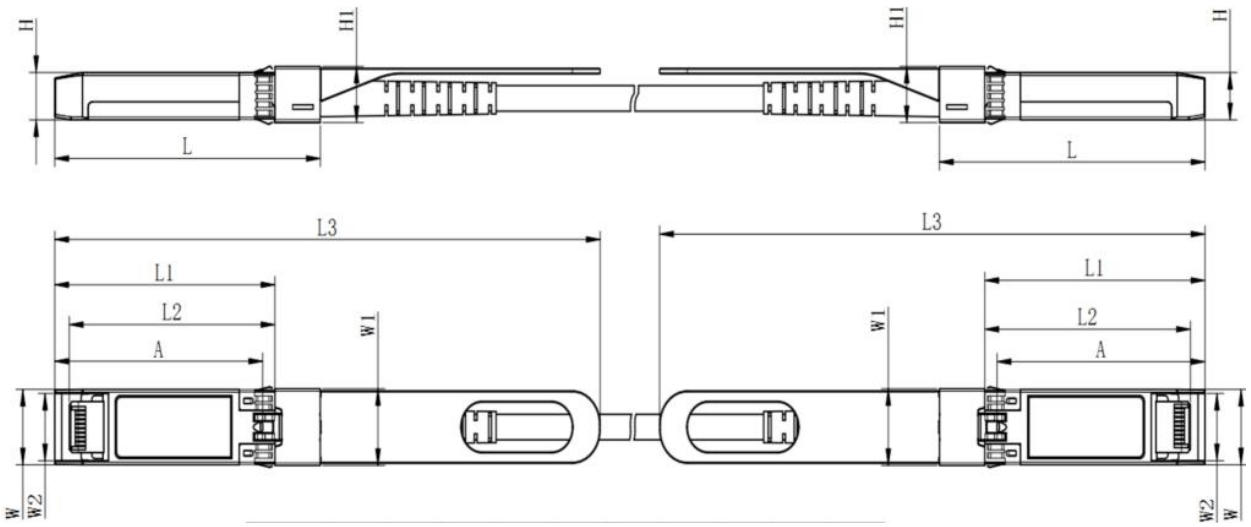
Figure 2 Pin view

Pin Descriptions

Table4- Pin Assignment

Pin	Logic	Symbol	Description	Power Sequence Order	Note
1		VeeT	Module Transmitter Ground	1st	1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	3rd	2
3	LVTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	3rd	3
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	3rd	
5	LVTTL-I	SCL	2-Wire Serial Interface Clock	3rd	4
6		MOD_ABS	Transmitter Non-Inverted Data Input	3rd	
7	LVTTL-I	RS0	Module Absent, connected to VeeT or VeeR in the module	3rd	
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication Active High	3rd	2
9	LVTTL-I	RS1	Not used	3rd	
10		VeeR	Module Receiver Ground	1st	1
11		VeeR	Module Receiver Ground	1st	1
12	CML-O	RD	Receiver Inverted Data Output	3rd	
13	CML-O	RD+	Receiver Data Output	3rd	
14		VeeR	Module Receiver Ground	1st	1
15		VccR	Module Receiver 3.3 V Supply	2nd	
16		VccT	Module Receiver 3.3 V Supply	2nd	
17		VeeT	Module Transmitter Ground	1st	1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	3rd	
19	CML-I	TD-	Transmitter Inverted Data Input	3rd	
20		VeeT	Module Transmitter Ground	1st	1

Mechanica



	L	L1	L2	L3	W	W1	W2	H	H1	A
MAX	57.6	47.7	44.55	119.9	13.8	14.0	12.3	8.7	10.3	45.25
Typical	57.4	47.5	44.35	117.9	13.55	13.8	12.1	8.5	10.1	45
MIN	57.2	47.3	44.15	115.9	13.3	13.6	11.9	8.4	9.9	44.65

Regulatory Compliance

Parameter	Value		Units
Diameter	3		mm
Minimum bend radius	30		mm
Length tolerance	Length ≤1 m:	+5 /-0	cm
	1 m ≤ length ≤ 4.5 m:	+15 / -0	cm
	5 m ≤ length ≤ 14.5 m:	+30 / -0	cm
	Length≥ 15.0 m	+2% / -0	m
Cable color	Orange(OM2),Aqua(OM3),Magenta(OM4)		

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.