


## GIGALIGHT 10G SFP+ Hardened Active Optical Cables GSS-MDO100-xxxT

### Features

- ◆ Supports SFF8431/SFF8432/SFF8472, I<sup>2</sup>C management interface
- ◆ Hot Pluggable SFP+ form factor, supports 10Gbps data rate
- ◆ 850nm VCSEL transmitter, PIN photo-detector receiver
- ◆ Up to 300m on OM3 MMF
- ◆ Operating case temperature: -40 to 85°C
- ◆ All-metal housing for superior EMI performance
- ◆ RoHS compliant (lead free) 
- ◆ Hardened active optical cable with metal tube and Kevlar strengthen



### Applications

- ◆ 10 Gigabit Ethernet
- ◆ 4G and 8G Fiber Channel Applications
- ◆ 1x InfiniBand QDR, DDR, SDR
- ◆ High-performance computing clusters
- ◆ Servers, switches, storage and host card adapters

### Description

Gigalight GSS-MDO100-xxxT Hardened Active Optical Cables are direct-attach fiber assemblies with SFP+ connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks.

Gigalight SFP+ Hardened Active Optical Cables is made of hardened optical cable structure with stainless steel metal tube, Kevlar strengthen and LSZH Jacket, support up to 300 meters on OM3 MMF, it's specially for outstanding long term reliability and harsh environment tolerance.

## Absolute Maximum Ratings

**Table 1 - Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	0	3.6	V
Storage Temperature	Ts	-20	+85	°C
Operating Case Temperature	C	-40	85	°C
Operating Humidity	-	5	85	%
Dynamic Bending Radius	Dbr		20D	mm
Static Bending Radius	Sbr		10D	mm

## Specifications and Recommended Operating Conditions

**Table 2 - Specifications and Recommended Operating Conditions**

Parameter	Min	Typical	Max	Unit	Notes
Power supply voltage	3.13	3.3	3.47	V	
Supply current		230		mA	per end typical
Channel Data Rate		10.3125		Gbps	
BER			<10 <sup>-12</sup>	/	/
Optical cable outer diameter		3.0		mm	
Optical cable loss			3.5	dB/km	OM3
Tensile 1		300		N	Long Term
Tensile 2		600		N	Short Term
Crush Resistance 1		2000		N/100mm	Long Term
Crush Resistance 1		3000		N/100mm	Short Term

## Optical characteristics

**Table 3 – Optical characteristics**

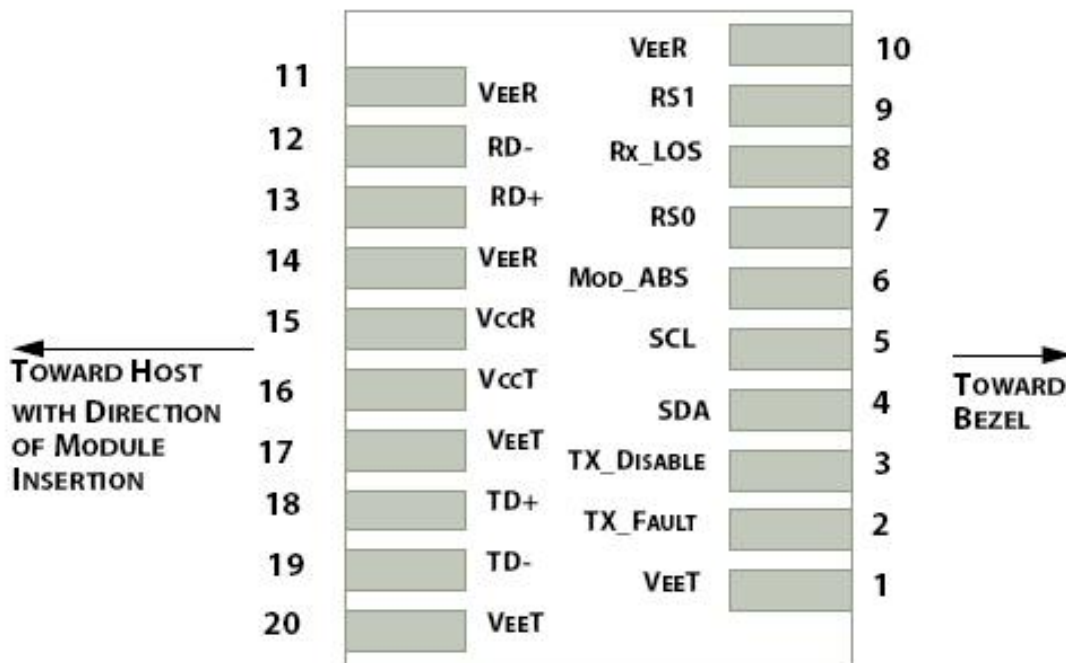
The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_t$	840	850	860	nm	
RMS spectral width	Pm	-	-	Note 1	nm	
Average Optical Power	Pavg	-6.5	-	-1	dBm	2
Extinction Ratio	ER	3.5	-	-	dB	3

Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	Rin	-	-	-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance		-	-	12	dB	
<b>Receiver</b>						
Center Wavelength	$\lambda_r$	840	850	860	nm	
Receiver Sensitivity	Psens	-	-	-11.1	dBm	4
Stressed Sensitivity in OMA		-	-	-7.5	dBm	4
Los function	Los	-30	-	-12	dBm	
Overload	Pin	-	-	-1.0	dBm	4
Receiver Reflectance		-	-	-12	dB	

**Note:**

1. Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in table 3.
2. The optical power is launched into MMF.
3. Measured with a PRBS  $2^{31}-1$  test pattern @10.3125Gbps.
4. Measured with a PRBS  $2^{31}-1$  test pattern @10.3125Gbps, BER $\leq 10^{-12}$ .



**Figure 1: Interface to Host PCB**

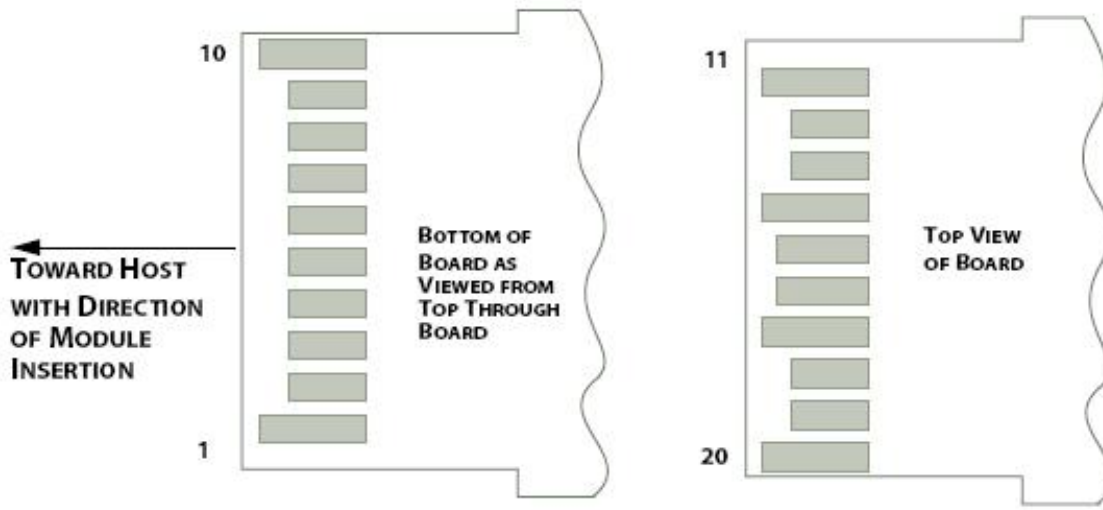


Figure 2: Module Contact Assignment

### Pin definition

Table 4 – Pin definition

Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply

17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

**Notes:**

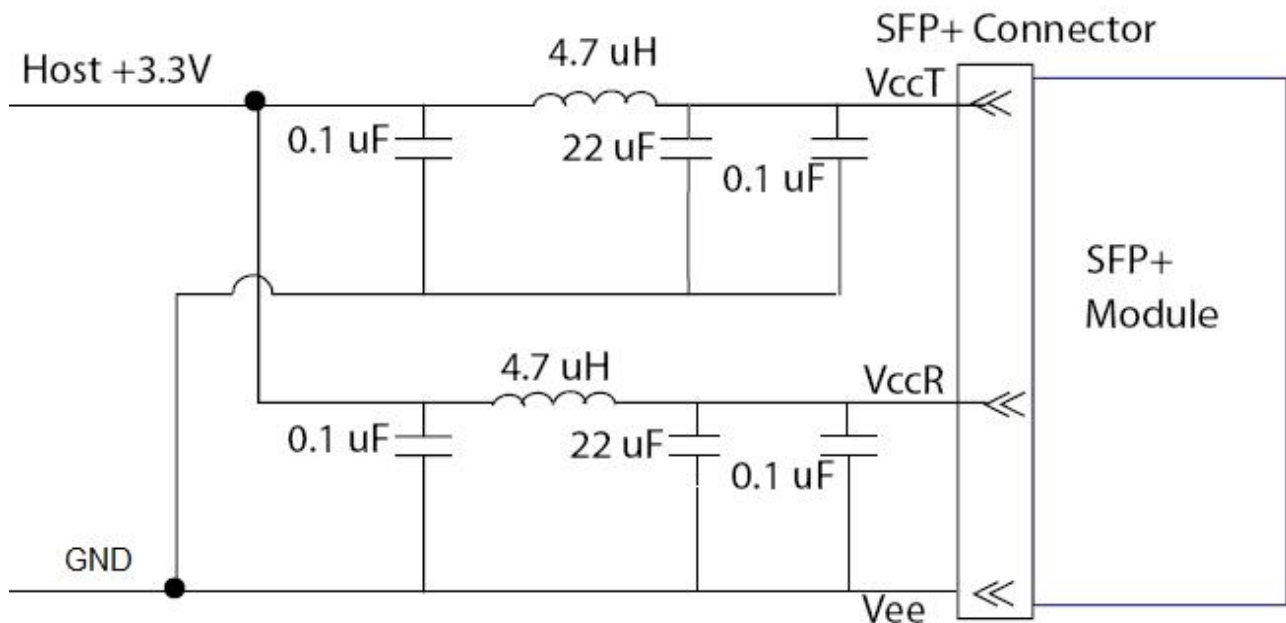
[1] Module circuit ground is isolated from module chassis ground within the module.

[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

[3]Tx\_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

[4]Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc\_Host with a resistor in the range 4.7 kΩ to 10 kΩ.Mod\_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.



**Figure3. Host Board Power Supply Filters Circuit**

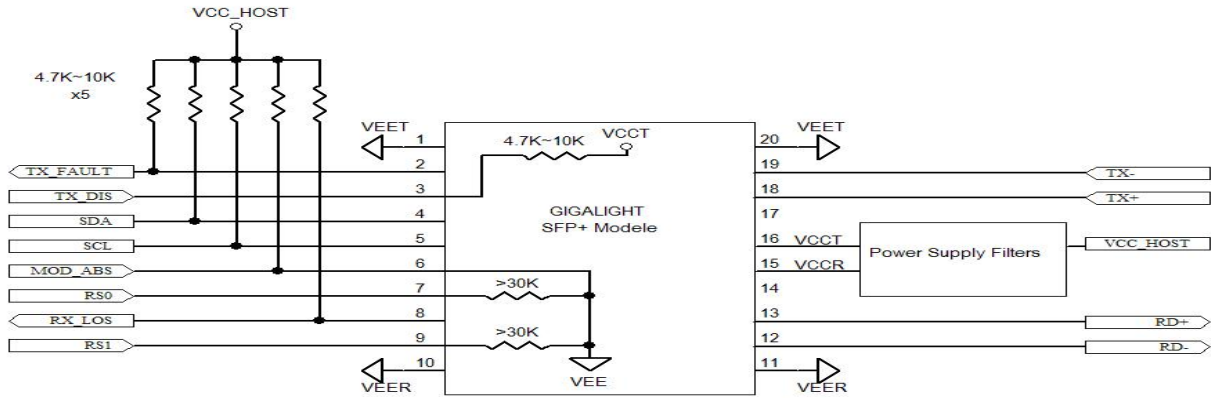


Figure4. Host-Module Interface

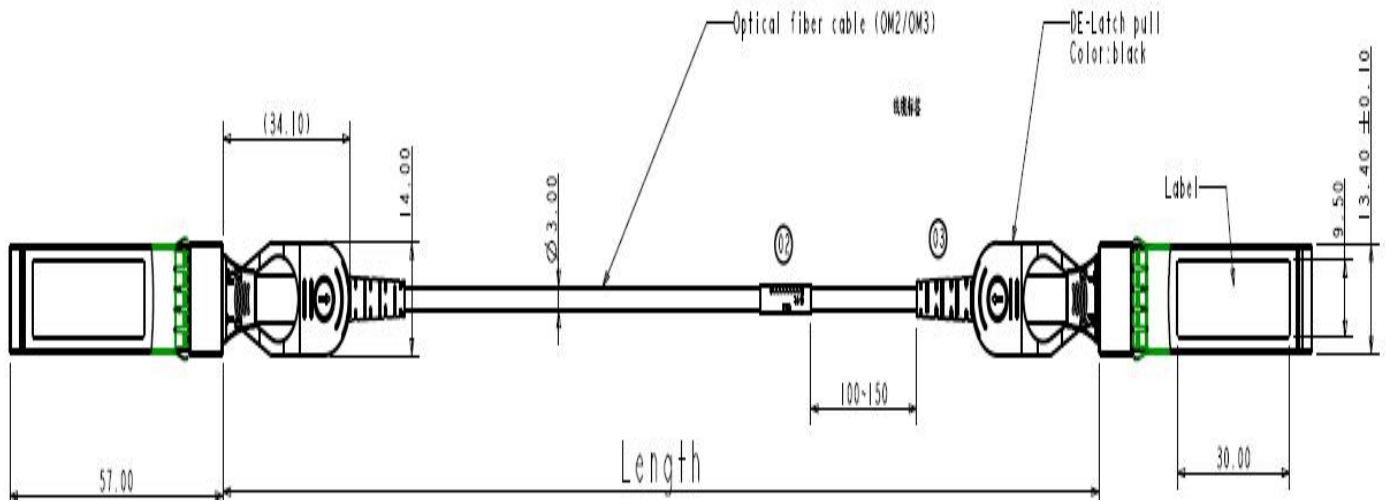
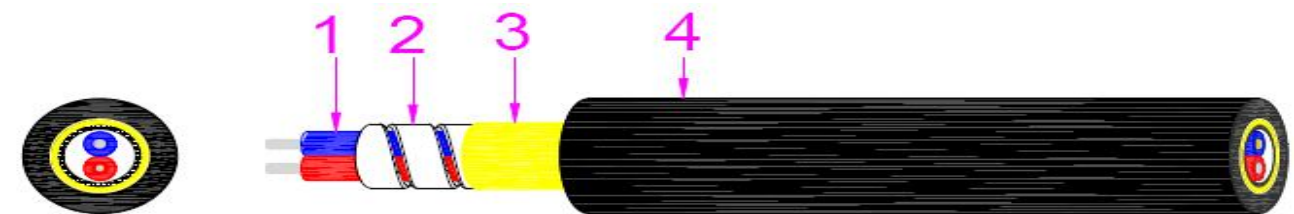


Figure5. Mechanical Specifications



光缆结构 Cable structure	材质/型号 Material /model	规格 Specifications	
1 光纤Optical Fiber	G652D/OM3	2- $\Phi 0.6 \pm 0.05$	
2 铠管Metal Tube	不锈钢Stainless steel	O.D	$\Phi 1.85 \pm 0.1$
		I.D	$\Phi 1.35 \pm 0.05$
		厚度/Thickness	$0.22 \pm 0.02$
3 加强件Strengthen	凯孚拉Kevlar	1100DTEX	
4 披覆Jacket	LSZH	直径Diameter	$\Phi 3.0 \pm 0.1$
		厚度/Thickness	$\geq 0.4$

Figure6. Hardened optical cable Specifications

## Regulatory Compliance

Gigalight GSS-MDO100-xxxT Hardened Active Optical Cable are Class 1 Laser Products. They meet the requirements of the following standards.

Feature	Standard
Laser Safety	IEC 60825-1:2014 (3 <sup>rd</sup> Edition) IEC 60825-2:2004/AMD2:2010 EN 60825-1-2014 EN 60825-2:2004+A1+A2
Electrical Safety	EN 62368-1: 2014 IEC 62368-1:2014 UL 62368-1:2014
Environmental protection	Directive 2011/65/EU with amendment(EU)2015/863
CE EMC	EN55032: 2015 EN55035: 2017 EN61000-3-2:2014 EN61000-3-3:2013
FCC	FCC Part 15, Subpart B ANSI C63.4-2014

## References

1. SFP MSA
2. 10GBASE-SR

## Ordering information

Part Number	Product Description
GSS-MDO100-xxxT	10Gbps, 850nm; SFP+ Hardened AOC with metal tube and Kevlar strengthen,300m OM3 fiber, -40°C ~ +85°C
XXX :001~300, Length in meters on OM3 MMF The optical fiber structure can be customized, further details are available from any Gigalight sales representative.	

**⚠ CAUTION:**

Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**Important Notice**

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**Revision History**

Revision	Date	Description
V0	Feb-28- 2022	Advance Release.