

# Product Specification

10G SFP+ to 10G SFP+ Active Optical Cable

PN: S10-S10-A



## Features

- Hot Pluggable SFP+ form factor
- Available length range 1~150m
- Active Optical Cable
- Operating data rate 10.3125Gbps
- Single +3.3V power supply
- Max power dissipation <0.8W
- Small diameter cable design
- Built-in digital diagnostic function
- Commercial temperature range 0°C to 70°C

## Compliance

- SFP+ MSA
- Compliant with SFP+ Electrical MSA SFF-8431
- Compliant with SFP+ Mechanical MSA SFF-8432
- SFF-8472
- RoHS

## Applications

- 1/2/4/8G Fibre Channel
- 10G Gigabit Ethernet
- 10 GbE high performance computer clusters
- Data center and in-rack connection
- High capacity IO with SFP+ interface

## Description

The 10G-SFP-A is an SFP+ Active Optical Cable (AOC) module delivering 10Gbps full-duplex connectivity for enterprise networks, data centers, and high-performance computing. Designed with integrated multimode fiber and low-power optical engines, it supports link lengths up to 100m while consuming <0.8W. Compliant with SFP+ MSA and IEEE 802.3ae standards, this hot-pluggable solution ensures plug-and-play compatibility with 10GBase-SR/LR interfaces, offering superior EMI immunity and flexibility compared to copper DACs. Its lightweight, bend-insensitive cable design simplifies rack management and reduces signal loss in dense deployments.

Featuring built-in DDM/DOM diagnostics for real-time performance monitoring, the module guarantees BER <1E-12 and stable operation across 0–70°C environments. Ideal for server interconnects, storage area networks, and switch aggregation, the 10G-SFP-A combines cost efficiency with future-proof scalability, enabling seamless upgrades from legacy 1G/2.5G infrastructures. Its ruggedized connectors and error-free transmission make it a reliable choice for mission-critical applications.

## Product performance Specifications

### 1、 Product Basic Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Storage Temperature	T <sub>s</sub>	-40	-	85	°C
Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V
Relative Humidity	RH	0		85	%
Operating Case Temperature	T <sub>c</sub>	0	25	70	°C
Total Power Dissipation	I <sub>cc</sub>			0.8	W
Data Rate Per Lane		1	10.3125		Gbps

### 2、 Product Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Note
<b>Transmitter</b>						
Output Center Wavelength	λ <sub>c</sub>	840	850	860	nm	
Operating Data Rate	DR	1.06	10.3125	11.3	Gbps	
Spectral width	P <sub>m</sub>				nm	1
Transmitter Dispersion Penalty	TDP			3.9	dBm	
Relative Intensity Noise	R <sub>in</sub>			-128	dB/Hz	
Extinction Ratio	ER	3.5			dB	3
Optical Return Loss Tolerance				12	dB	
Average Optical Power	P <sub>avg-</sub>	-6.5		-1	dBm	2

Receiver						
Center Wavelength	$\lambda_r$	840	850	860	nm	
Receiver Sensitivity	P <sub>sens</sub>			-11.1	dBm	4
Stressed Sensitivity in OMA				-7.5	dBm	4
Los function	Los	-30		-12	dBm	
Overload	Pin			-1	dBm	4
Receiver Reflectance				-12	dBm	

**Note1:** Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in the table.

**Note2:** The optical power is launched into MMF.

**Note3:** Measured with a PRBS 231-1 test pattern @10.3125Gbps.

**Note4:** Measured with a PRBS 231-1 test pattern @10.3125Gbps, BER<10<sup>-12</sup>.

### Recommended Host Board Power Supply Circuit

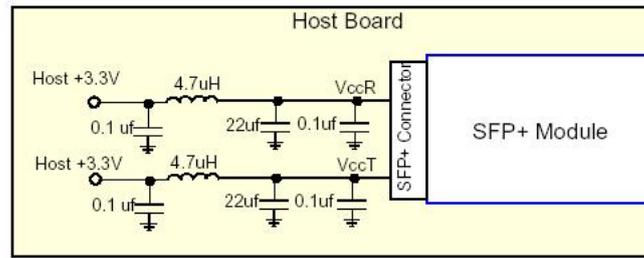


Figure 1: Recommended Host Board Power Supply Circuit

### Recommended Interface Circuit

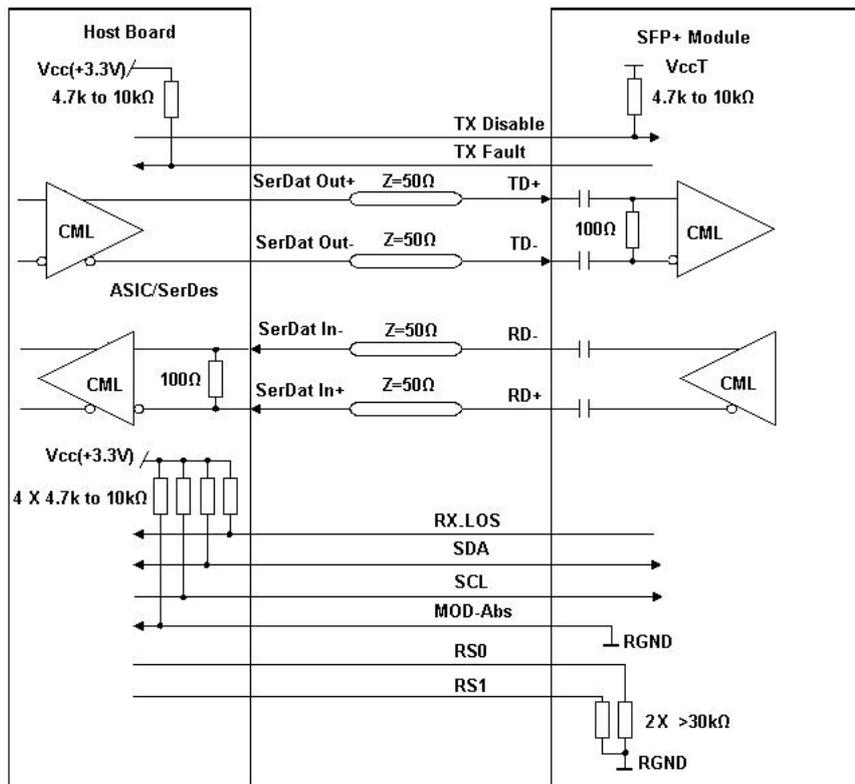


Figure 2: Recommended Interface Circuit

## Pin-out Definition

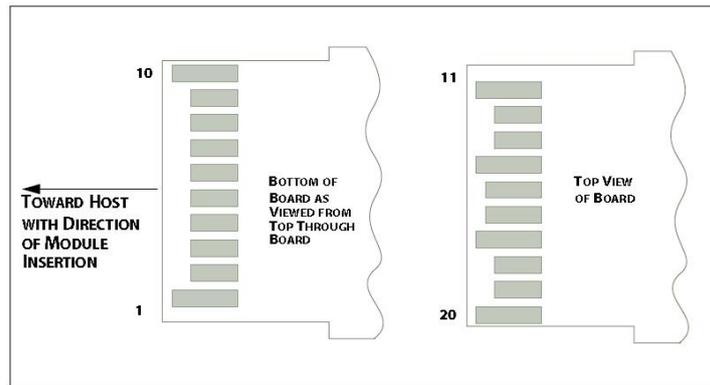


Figure3:Pin view

## Pin Function Definitions

Pin	Logic	Symbol	Description
1		VeeT <sub>1</sub>	Module Transmitter Ground
2	LVTTTL-O	TX_Fault <sub>2</sub>	Module Transmitter Fault
3	LVTTTL-I	TX_Disable <sub>3</sub>	Transmitter Disable; Turns off transmitter laser output
4	LVTTTL-I/O	SDA4	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)
5	LVTTTL-I/O	SCL4	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)
6		MOD_ABS5	Module Absent, connected to VeeT or VeeR in the module
7	LVTTTL-I	RS06	Adaptive multi-rate operation
8	LVTTTL-O	RX_LOS <sub>2</sub>	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)
9	LVTTTL-I	RS16	Adaptive multi-rate operation
10		VeeR <sub>1</sub>	Module Receiver Ground
11		VeeR <sub>1</sub>	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14		VeeR <sub>1</sub>	Module Receiver Ground
15		VccR	Module Receiver 3.3 V Supply
16		VccT	Module Transmitter 3.3 V Supply
17		VeeT <sub>1</sub>	Module Transmitter Ground

18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20		VeeT <sub>1</sub>	Module Transmitter Ground

**Note1:**The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.

**Note2:**This pin is an open collector/drain output pin and shall be pulled up with 4.7kΩ-10kΩ to Host\_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5V.

**Note3:**This pin is an open collector/drain input pin and shall be pulled up with 4.7kΩ-10kΩ to VccT in the module.

**Note4:**See SFF-8431 4.2 2-wire Electrical Specifications.

**Note5:**This pin shall be pulled up with 4.7kΩ-10kΩ to Host\_Vcc on the host board.

**Note6:**Connect with 30kΩ load pulled down to GND in the module.

### Monitoring Specification

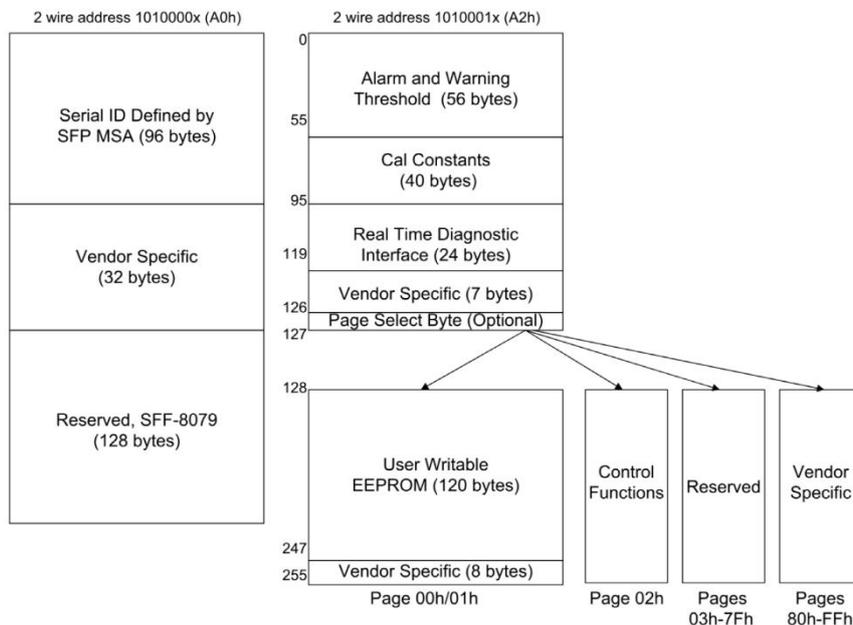


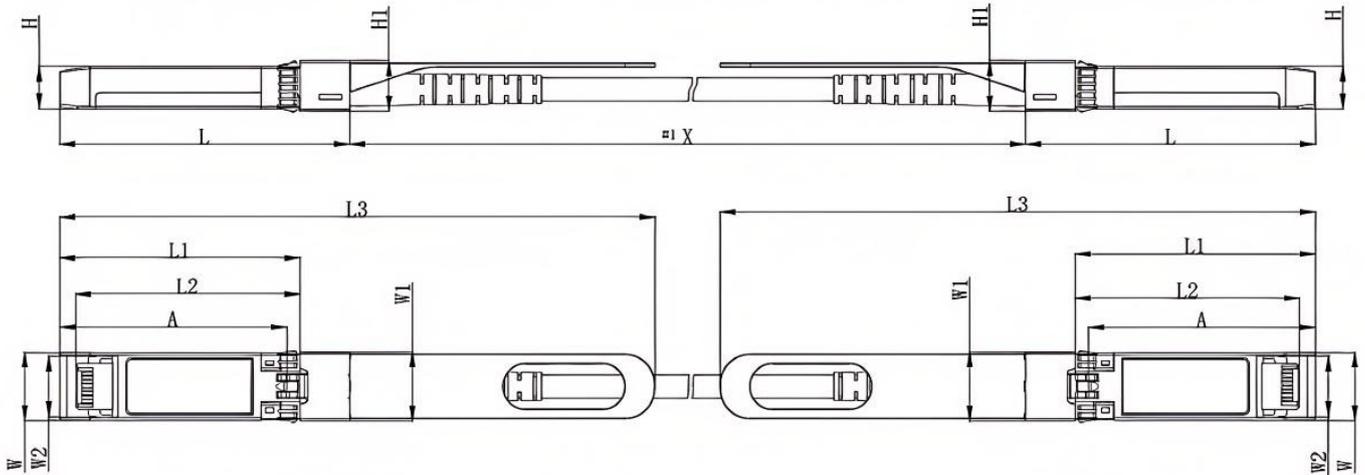
Figure4:Memory map

### Memory map table

Byte	Unit	Name	Description
<b>A0h ID Fields</b>			
0	1	Identifier	Type of transceiver
1	1	Ext. Identifier	Extended identifier of type of transceiver
2	1	Connector	Code for connector type

3-10	8	Transceiver	Code for electronic or optical compatibility
11	1	Encoding	Code for high speed serial encoding algorithm
12	1	Signaling Rate, Nominal	Nominal signaling rate, units of 100 MBd.
13	1	Rate Identifier	Type of rate select functionality
14	1	Length (SMF,km) or Copper Cable Attenuation	Link length supported for single-mode fiber, units of km, or copper cable attenuation in dB at 12.9 GHz
15	1	Length (SMF) or Copper Cable Attenuation	Link length supported for single-mode fiber, units of 100 m, or copper cable attenuation in dB at 25.78 GHz
16	1	Length (50 um, OM2)	Link length supported for 50 um OM2 fiber, units of 10 m
17	1	Length (62.5 um, OM1)	Link length supported for 62.5 um OM1 fiber, units of 10 m
18	1	Length (OM4 or copper cable)	Link length supported for 50um OM4 fiber, units of 10 m. Alternatively, copper or direct attach cable, units of m
19	1	Length (OM3) or Cable length, additional	Link length supported for 50 um OM3 fiber, units of 10 m. Alternatively, copper or direct attach cable multiplier and base value
20-35	16	Vendor name	SFP vendor name (ASCII)
36	1	Transceiver	Code for electronic or optical compatibility
37-39	3	Vendor OUI	SFP vendor IEEE company ID
40-55	16	Vendor PN	Part number provided by SFP vendor (ASCII)
56-59	4	Vendor rev	Revision level for part number provided by vendor (ASCII)
60-61	2	Wavelength	Laser wavelength (Passive/Active Cable Specification Compliance)
62	1	Fibre Channel Speed 2	Transceiver's Fibre Channel speed capabilities
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)
64-65	2	Options	Indicates which optional transceiver signals are implemented
66	1	Signaling Rate, max	Upper signaling rate margin, units of %
67	1	Signaling Rate, min	Lower signaling rate margin, units of %
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)
84-91	8	Date code	Vendor's manufacturing date code
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any) in the transceiver
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any) in the transceiver
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with.
95	1	CC_EXT	Check code for the Extended ID Fields (addresses 64 to 94)
96-127	32	Vendor Specific	Vendor Specific EEPROM
128-255	128	Reserved	Reserved (was assigned to SFF-8079)

**Mechanical Dimension**



**Note:**

- Diameter: 3mm
- Minimum bend radius:30mm
- Cable color:Orange(OM2),Aqua(OM3),Magenta(OM4)
- When  $L \leq 1m$ , the tolerance is +5cm
- When  $1m \leq L \leq 4.5m$ , the tolerance is +15cm
- When  $5m \leq L \leq 14.5m$ , the tolerance is +30cm
- When  $L \geq 15m$ , the tolerance is +2%m

**Waring:**

- The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.
- 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.