Product Specification Sheet

TNSP8C1XA-CDXXX

10G SFP+ Active Optical Cable

Applications

- 10G Ethernet
- Applicable to 1G Ethernet
- Applicable to 4G / 2G / 1G Fiber Channel
- 10G Fiber Channel over Ethernet
- 1X QDR Infiniband
- Applicable to 1X DDR / 1x SDR Infiniband
- High capacity IO with SFP+ interface

Features

- Hot pluggable
- Bit rate support from 1G to 11.3Gbps
- Pre-terminated twin axial cable / fiber cable
- Programmable EEPROM for serial identification
- Low power consumption
- SFP+ housing with enhanced EMI shielding
- Single 3.3V power supply
- Operating environment temperature 0 ~ 70℃

Descriptions

The 10G SFP+ Active Optical Cables (AOC) are direct-attach fiber assemblies with SFP+ connectors. They are suitable for short distances and offer a cost-effective solution to connect within racks and across adjacent racks. The length is up to 100 meters using OM3 MMF.

SFP+ AOC Specifications

Parameter	Description
Module Form Factor	SFP+ (Supports SFF8431/SFF8432/SFF8472)
Protocols Supported	InfiniBand, Ethernet, Fiber Channel
Channel Data Rate	Rate 1 to 10.3125Gbps
BER	<10-12
Operating Case Temperature	0 to + 70ºC
Storage Temperature	-20 to + 85ºC
Supply Voltage	3.3V
Supply current	230mA per end typical
Management Interface Serial	I2C (Supports SFF8472)

Electrical Characteristics

Parameter	**Symbol**	**Unit**	**min**	**Max**
Supply Current	Icc	mA		150
Power Consumption	Pdiss	W		0.5
Tx Input Differential Impedance	Zin_d	W	100 (typ.)	
Tx Input Differential Swing	Vin_d	mV	120	1000
Rx Output Differential Impedance	Zout_d	W	100 (typ.)	
Rx Output Differential Swing	Vout_d	mV	400	800
Rx_LOS VOH	VLOS_H	V	2	Vcc+0.3
Rx_LOS VOL	VLOS_L	V	-0.3	0.4

Optical characteristics

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

Parameter	**Symbol**	**Min.**	**Typical**	**Max**	**Unit**	**Notes**
Transmitter						
Center Wavelength	λt	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	
Receiver						
Center Wavelength	λr	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	

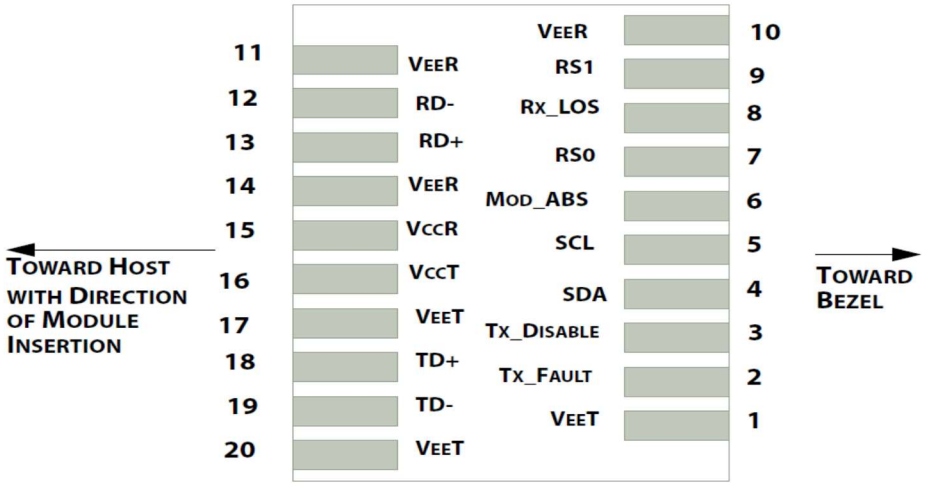
1.Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in table 6.

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.

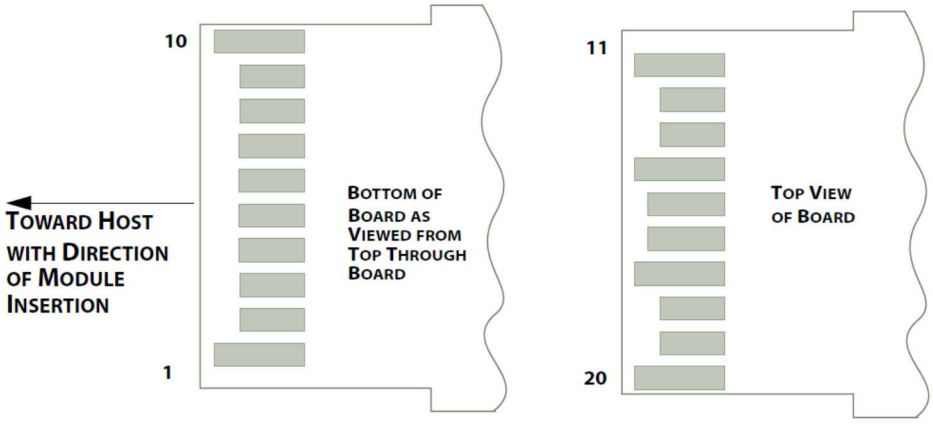
Host Board Connector Pin (Top View)



Note:

For detail information, please refer to SFF-8083 0.8mm Card Edge Connector for 8/10 Gbps Applications

SFP+ Connector Pin



Pin Descriptions

Pin	Symbol	Logic	Description	Note
1	VeeT		Module Transmitter Ground	1
2	Tx_Fault	LVTTL-O	Not supported.	3
3	Tx_Disable	LVTTL-I	Not supported.	3
4	SDA	LVTTL-I/O	2-wire Serial Interface Data Line	2
5	SCL	LVTTL-I/O	2-wire Serial Interface Clock	2
6	Mod_ABS		Module Absent	2
7	RS0	LVTTL-I	Not supported.	3
8	Rx_LOS	LVTTL-O	Not supported.	3
9	RS1	LVTTL-I	Not supported.	3
10	VeeR		Module Receiver Ground	1
11	VeeR		Module Receiver Ground	1
12	RD-	CML-O	Receiver Inverted Data Output	
13	RD+	CML-O	Receiver Non-Inverted Data Output	
14	VeeR		Module Receiver Ground	1

15	VccR		Module Receiver 3.3 V Supply	4
16	VccT		Module Transmitter 3.3 V Supply	4
17	VeeT		Module Transmitter Ground	1
18	TD+	CML-I	Transmitter Non-Inverted Data Input	
19	TD-	CML-I	Transmitter Inverted Data Input	
20	VeeT		Module Transmitter Ground	1

Notes:

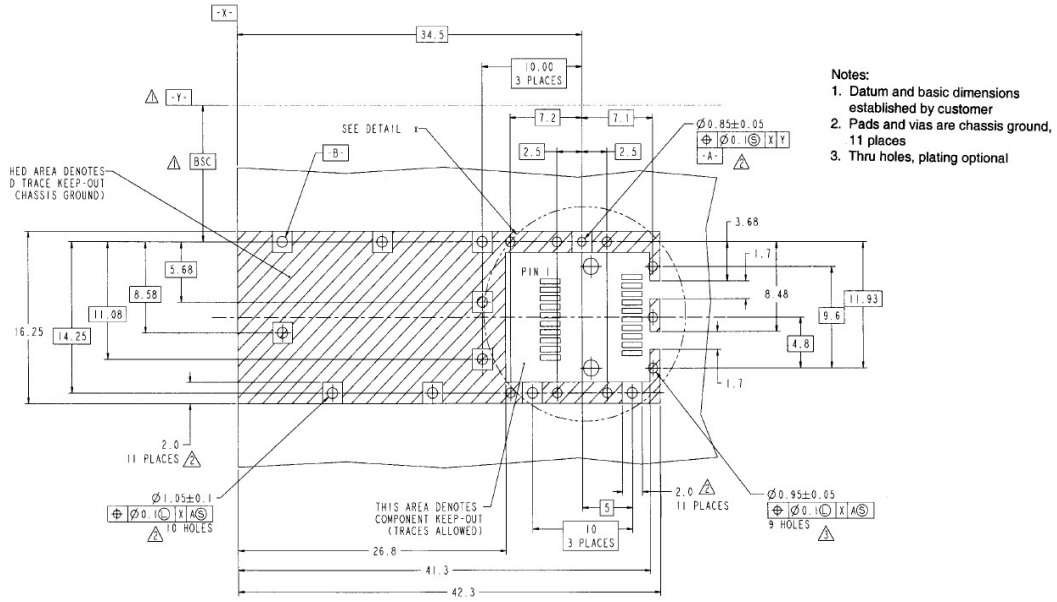
1.Module circuit ground pins are isolated from the module chassis ground.

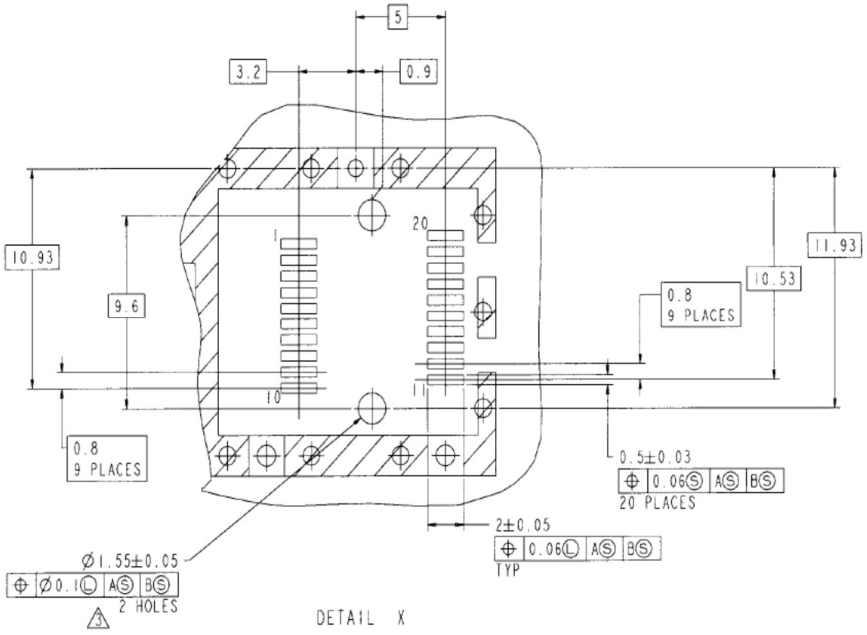
2.Pull up to VccHost with 4.7k – 10k.

3.No connection required.

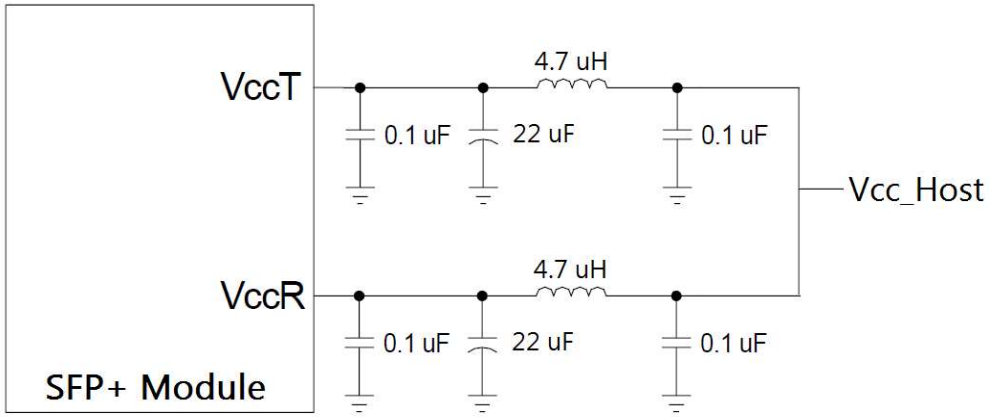
4.Power supply filtering circuit required.

Host PCB Layout





Recommended Power Supply Filter



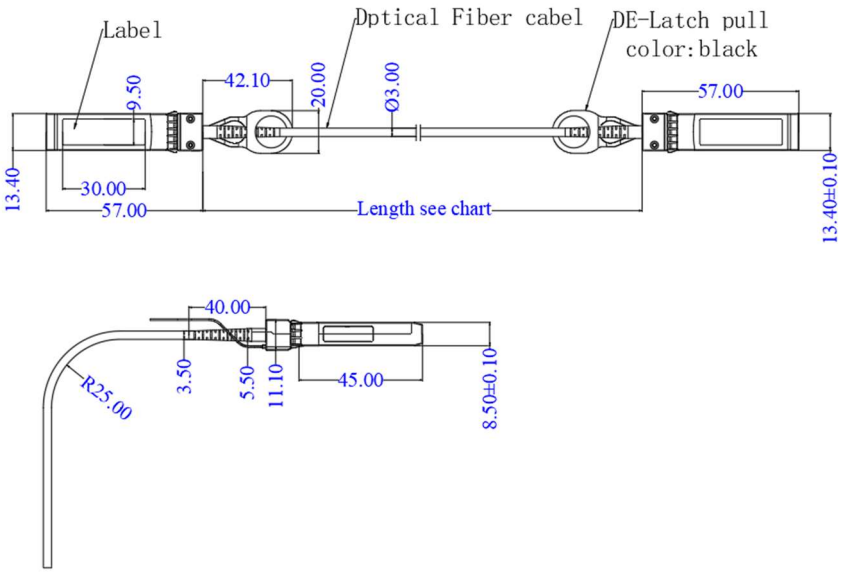
References:

1.SFF-8431 "Specifications for Enhanced Small Form Factor Pluggable Module SFP+"

2.SFF-8432 "Specification for Improved Pluggable Form factor

3.SFF-8472 "Specification for Diagnostic Monitoring Interface for Optical Transceivers"

Mechanical Drawing



Ordering Information

Part Number	Description
TNSP8C1XA-CDXXX	10G SFP+ Active Optical Cable xxxM