



# 产 品 规 格 书

## *Product Specification Sheet*

### TOP-SFP+-CWDM-LH-XX

RoHS Compliant 10Gb/s SFP+ CWDM 10km Optical Transceiver



E-mail : [csale@topsfp.com](mailto:csale@topsfp.com)





## **PRODUCT FEATURES**

- Optical interface compliant to IEEE 802.3ae 10GBASE-LR
- 4-Wavelengths CWDM DFB transmitter from
- Hot pluggable
- 1270nm to 1330nm, PIN photo-detector
- Applicable for 10km SMF connection
- Low power consumption
- All-metal housing for superior EMI performance
- Operating case temperature: 0 to 70 °C

## **APPLICATIONS**

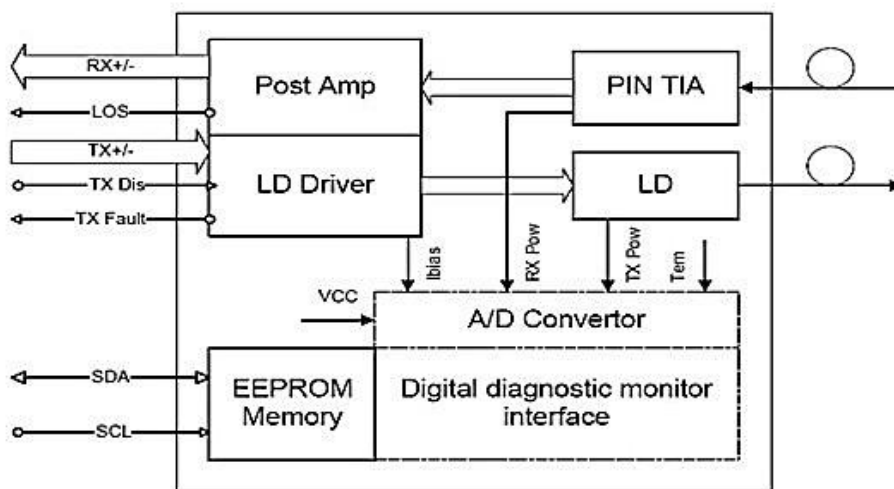
- 10GBASE-LR at 10.3125Gbps
- Other optical links
- 10G Ethernet

## **PRODUCT DESCRIPTIONS**

This CWDM DFB 10Gbps SFP+ transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 10km.

The transceiver consists of two sections: The transmitter section incorporates a DFB laser. And the receiver section consists of a PIN photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

### FUNCTIONAL DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

### GERERAL OPERATING CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet		10.3125		Gb/s	
	Fiber Channel		10.518			
Supply Voltage	Vcc	3.13	3.3	3.47	V	
	Vcc				V	
Supply Current	Icc <sub>s</sub>				mA	
	Icc <sub>3</sub>			300	mA	
Operating Case Temp.	Tc	0		70	°C	

**ELECTRICAL INPUT/OUTPUT CHARACTERISTICS**● **Transmitter**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	VIH	2.0	Vcc+0.3	V	
	L	VIL	0	0.8		
Tx Fault output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		
Input Diff. Impedance	Zin		100		Ω	

● **Receiver**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. output voltage swing		340	650	800	mVpp	3
Rx LOS Output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.

Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.

Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

**OPTICAL CHARACTERISTICS**● **Transmitter**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength			XX		nm	4
Ave. output power (Enabled)	Po	-6		0	dBm	1
Extinction Ratio	ER	4			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			50	ps	2
Optical modulation amplitude	OMA	-6.2			dBm	
Dispersion penalty				1	dB	
Output Optical Eye	Compliant with IEEE 0802.3ae					

● **Receiver**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1260		1355	nm	
Sensitivity	Psen			-14.4	dBm	3
Min. overload	Pimax	0.5			dBm	



<b>LOS Assert</b>	Pa	-30			dBm	
<b>LOS De-assert</b>	Pd			-16	dBm	
<b>LOS Hysteresis</b>	Pd-Pa	0.5		4	dB	

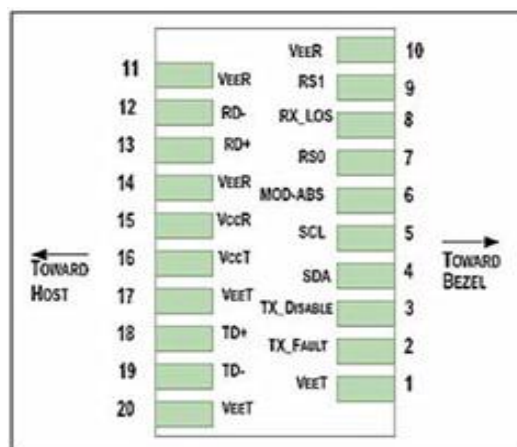
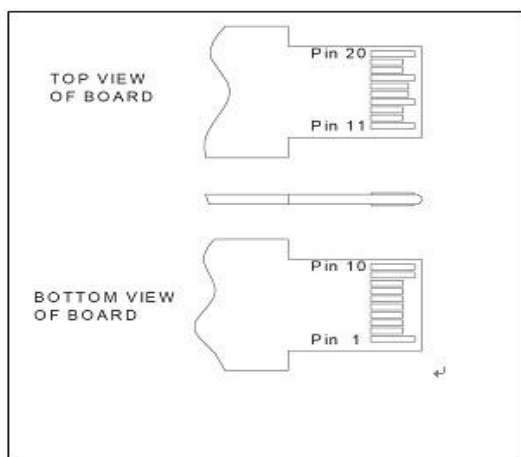
Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern.

Note 2) 20%~80%

Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10<sup>-12</sup>

Note 4) If there is CWDM Product ,the wavelength XX — 1270nm-1330nm

### PIN DEFINITIONS AND FUNCTIONS



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
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal
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.

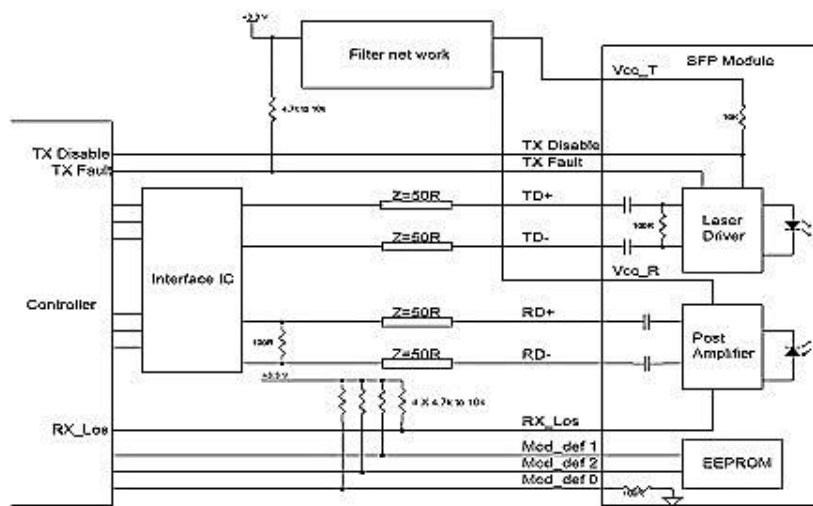
[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

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

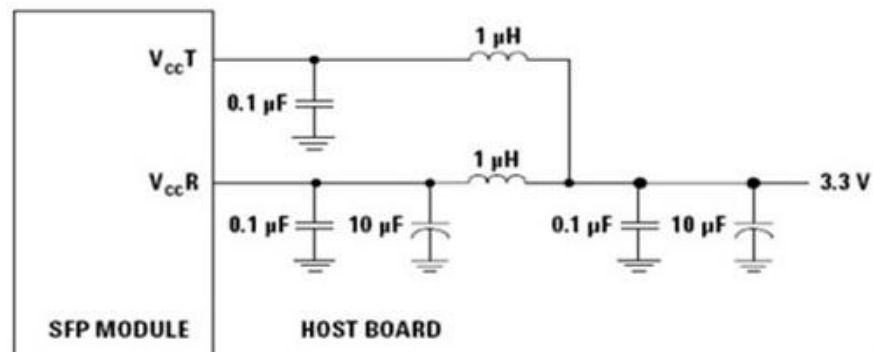
[4]Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc\_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod\_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

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

### TYPICAL INTERFACE CIRCUIT



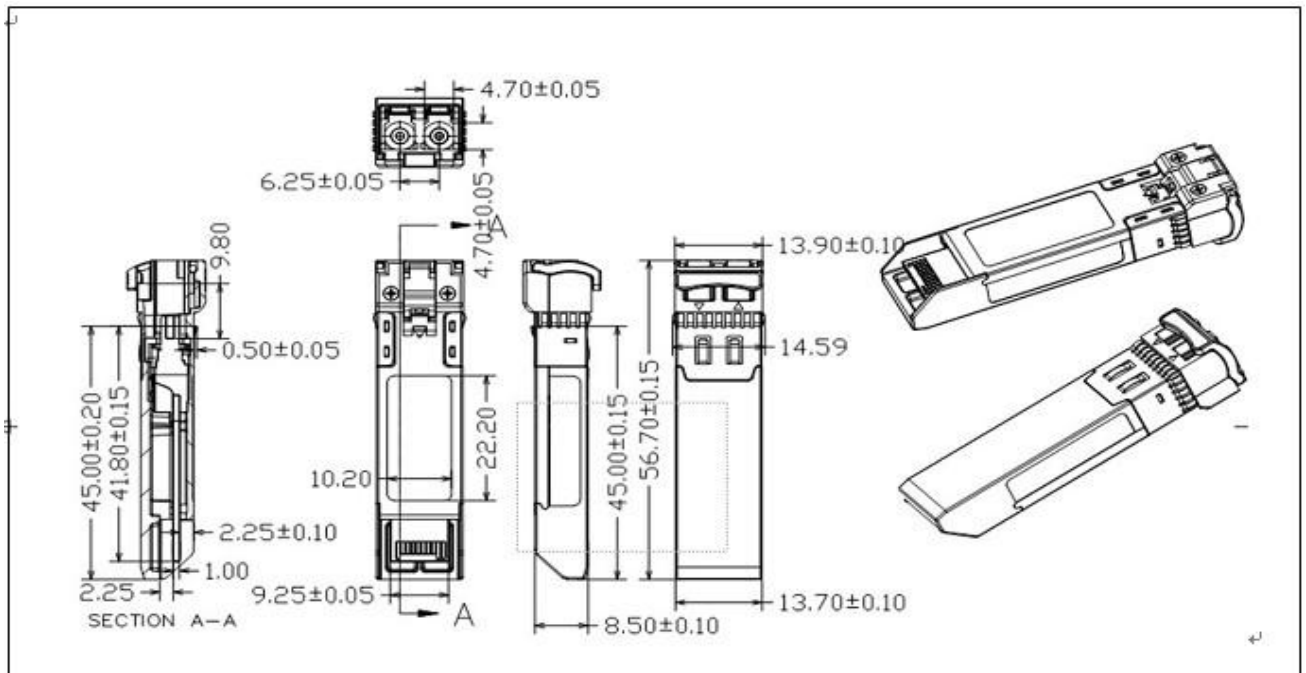
### Recommended power supply filter



Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value



### PACKAGE DIMENSIONS



### ORDERING INFORMATION

Part Number	Description
TOP-SFP+-CWDM-LH-27	SFP+ PLUS, 10.3125Gbps, 1270nm, 10km, 0~70°C, with DDM
TOP-SFP+-CWDM-LH-29	SFP+ PLUS, 10.3125Gbps, 1290nm, 10km, 0~70°C, with DDM
TOP-SFP+-CWDM-LH-31	SFP+ PLUS, 10.3125Gbps, 1310nm, 10km, 0~70°C, with DDM
TOP-SFP+-CWDM-LH-33	SFP+ PLUS, 10.3125Gbps, 1330nm, 10km, 0~70°C, with DDM



## **Topstar Technology Industrial Co., Ltd**

**Add: F5, Rongcheng Building, 28 Yayuan Road Wuhe Community,  
BanTian Street, Shenzhen, China**

**Tel: +86 755 8255 2969 Email: [lisa@topsfp.com](mailto:lisa@topsfp.com)**

**Skype: [lisalin6565](https://www.skype.com/people/lisalin6565) WhatsApp: +86 13798265065**

**WeChat: 251081707**

**Facebook and Linked in: Topstar Technology Industrial Co., Ltd**

