



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

# 产品规格书

## *Product Specification Sheet*

### TOP-SFP-2.5G-20D

RoHS Compliant 2.5Gbps 1310nm 20KM Single mode Optical Transceiver



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### **Product Features**

- Transceiver unit with independent
- DFB laser transmitter and PIN photo-detector
- Multi-rate operation, optimized at 2.488Gb/s
- Up to 20KM transmission distance on 9/125 $\mu$ mSMF
- Standard serial ID information compliant with SFPMSA
- SFPMS A package with duplex LC connector
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3Vsingle power supply
- RoHS compliant
- Case operating temperature
- Commercial:0°Cto+70°C Extended: -10°Cto+80°C Industrial:-40°Cto+85°C

### **Applications**

- Switch/Router
- SAN/Server
- Fiber Channel
- Other optical transmission systems

### **Standard**

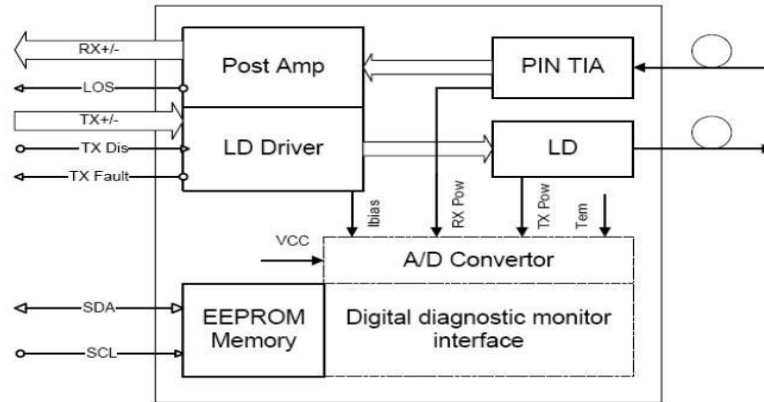
- SFPMSA(VersionSept.142000)compliant
- SFF-8472(Rev9.3,Aug.2002)Digital Diagnostic Monitoring Interface for Optical Transceivers compliant
- ITU-TG957andG958compliant
- TelcordiaGR-253-COREcompliant
- TelcordiaGR-468-COREcompliant
- FCC Part 15,ClassB



**Description**

SFP 2.5G 20KM 1310nm single mode optical transceivers are optimized for STM-16/OC-48 optical interface for telecom applications. They are designed for Multi-rate operation. The transceivers are optimized for high performance and cost effective to supply customers the best solutions for telecom applications.

**Functional Diagram**



**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max	Unit	Notes
Supply Voltage	Vcc	-0.5	3.60	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	95	%	

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

**General Operating Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate			2.488		G b	
Supply Voltage	Vcc	3.1	3.3	3.5	V	
Supply Current	Icc			27 0	m A	
Operating Case		0		70	°C	



		-10		80		
		-45		85		

**Electrical Input/Output Characteristics**

**• Transmitter**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff.InputVoltageSwing		300		1800	mVpp	1
TxDisableInput	H	VIH	2.0	Vcc+	V	
	L	VIL	0	0.8		
TxFault Output	H	VOH	2.0	Vcc+	V	2
	L	VOL	0	0.5		
InputDiff.Impedance	Zin		100		Ω	

**• Receiver**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff.OutputVoltageSwing		400		1000	mVpp	1
RxLOS Output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		

Note1)AC-Coupled CML logic family.

Note2)TxFault and RxLOS are open collector outputs,which should be pulled up with4.7kto10kΩohm resistors on the host board.Pull up voltage between2.0V and Vcc+0.3V.

**Optical Characteristics**

**Transmitter**

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave.Out put Power (Enable)	Po	-5		0	dBm	1
Side mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	8.2			dB	1
WavelengthRange	λc	1270	1310	1360	nm	
SpectralWidth(RMS)	Δλ			1	nm	
OutputOptical Eye	ITU-TG.957 Compliant					



**Receiver**

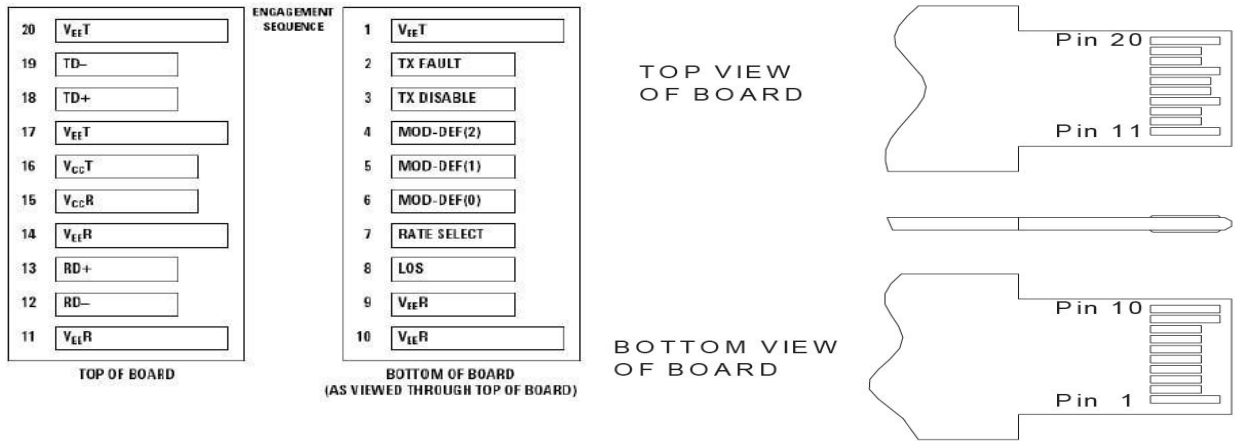
Parameter	Symbol	Min.	Type	Max.	Unit	Notes
OperatingWavelength		1270		1610	nm	
Sensitivity	Pimin			-20	dBm	3
Min. Overload	Pimax	-1			dBm	3
LOSAssert	Pa	-35			dBm	
LOSDe-assert	Pd			-22	dBm	
LOSHysteresis	Pd-Pa	0.5		6	dB	

Note1) Measured at 2488Mb/s with PRBS223–1NRZ test pattern.

Note2) Meet the specified maximum output jitter requirements if the specified maximum input jitter is present.

Note3) Measured at 2488 Mb/s with PRBS223–1NRZ test pattern for BER<1x10-10

**Pin Definitions and Functions**



PIN #	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Txfaultindication,OpenCollectorOutput,active“H”	Note1
3	TxDisable	LVTTLInput,internalpull-up,Txdisabledon“H”	Note2
4	MOD-DEF2	2wireserialinterfacedatainput/output(SDA)	Note3
5	MOD-DEF1	2wireserialinterfaceclockinput(SCL)	Note3
6	MOD-DEF0	Modelpresentindication	Note3
7	Rateselect	Noconnection	



8	LOS	Rxloss of signal, Open Collector Output, active "H"	Note4
9	VeeR	Rxground	
10	VeeR	Rxground	
11	VeeR	Rxground	
12	RD-	Inverse received data out	Note5
13	RD+	Received data out	Note5
14	VeeR	Rxground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note6
19	TD-	Inverse transmit data in	Note6
20	VeeT	Tx ground	

Note1) When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 –10K $\Omega$  resistor on the host board.

Note2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7–10K $\Omega$  resistor. Its states are:

Low(0–0.8V): Transmitter on (>0.8, <2.0V): Undefined

High(2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled

Note3) Mod-Def0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7K–10K $\Omega$  resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.

Mod-Def0 has been grounded by the module to indicate that the module is present

Mod-Def1 is the clock line of two wire serial interface for serial ID

Mod-Def2 is the data line of two wire serial interface for serial ID

Note4) When high, this output indicates loss of signal (LOS). Low indicates normal operation.

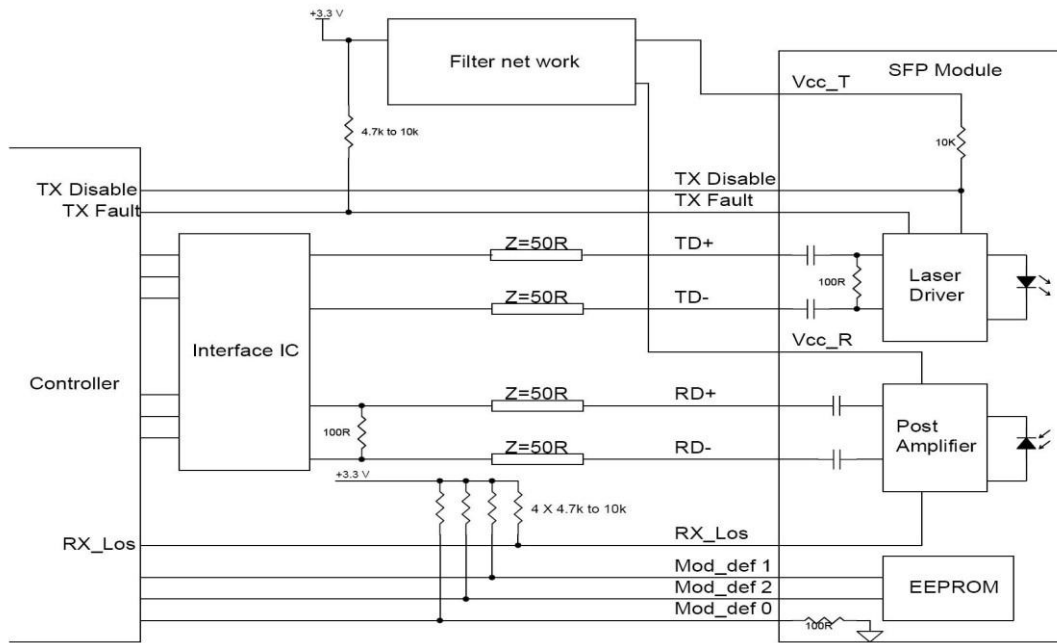
Note5) RD+/-: These are the differential receiver outputs. They are AC coupled 100 $\Omega$  differential lines which should be terminated with 100 $\Omega$ (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

Note6) TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with

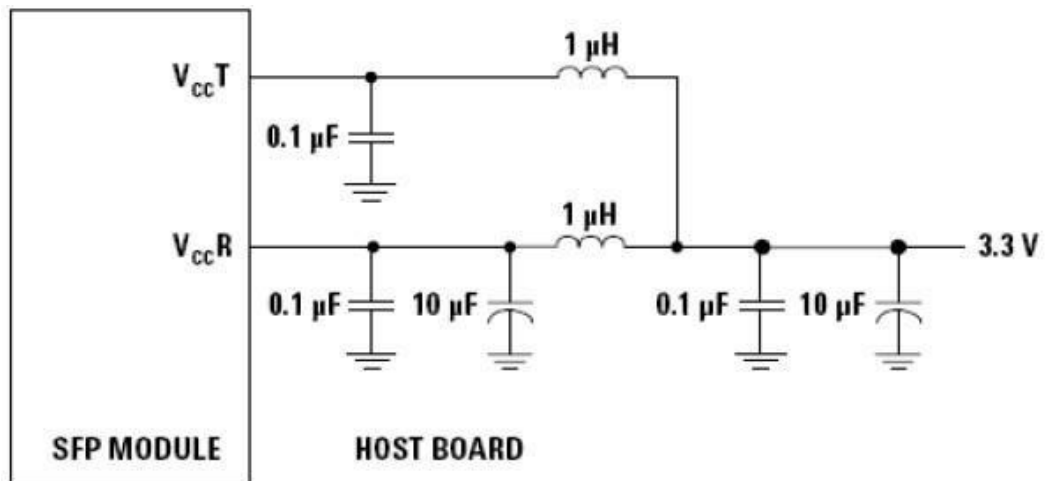
100 $\Omega$  differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.



Typical Interface Circuit



Recommended power supply filter

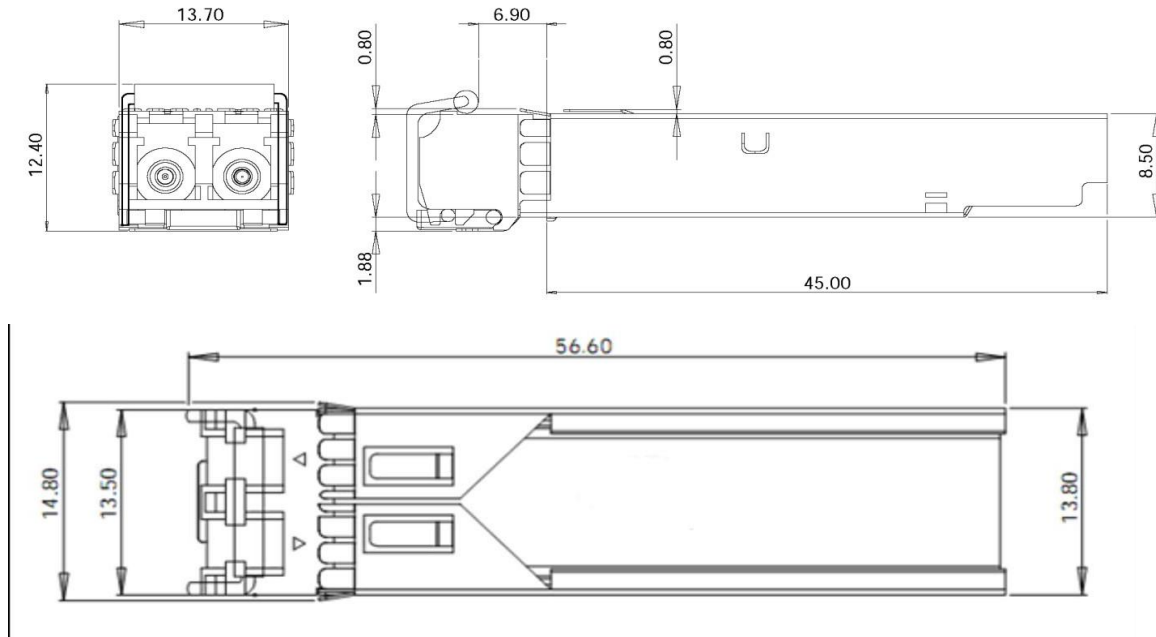


Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than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





### Package Dimensions



### Ordering Information & Related Products

TOP-SFP-2.5G-20	Dual Fiber SFP, 2.5Gbps, 1310nm, 20KM, without DDM
TOP-SFP-2.5G-20D	Dual Fiber SFP, 2.5Gbps, 1310nm, 20KM, with DDM





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