



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产 品 规 格 书

Product Specification Sheet

TOP-SFP-2.5G-2D

RoHS Compliant 2.5Gbps 1310nm 2KM Single mode Optical Transceiver



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Product Features

- Transceiver unit with independent
- FP laser transmitter and PIN photo-detector
- Multi-rate operation, optimized at 2.488Gb/s
- Up to 2KM transmission distance on 9/125 μ m SMF
- 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
- +3.3V single 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 system

Standard

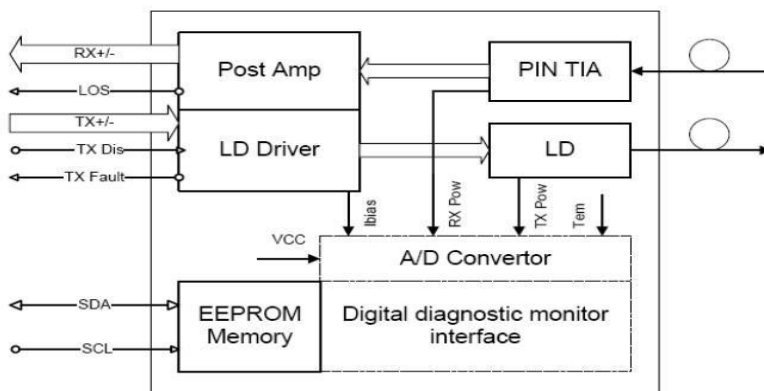
- SFPMSA(VersionSept.142000)compliant
- SFF-8472(Rev9.3,Aug.2002)Digital Diagnostic Monitoring Interface for Optical Transceivers compliant
- ITU-TG957andG958compliant
- TelcordiaGR-253-COREcompliant
- TelcordiaGR-468-COREcompliant
- FCCPart15,ClassB



Description

SFP 2.5G 2KM 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
SupplyVoltage	Vcc	-0.5	3.60	V	
StorageTemperature		-40	85	°C	
RelativeHumidity		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
DataRate			2.488		Gb/s	
SupplyVoltage	Vcc	3.1	3.3	3.5	V	
SupplyCurrent	Icc			270	mA	
Operating Case Temperature	Tc	0		70	°C	
		-10		80		
		-45		85		

Electrical Input/Output Characteristics

• Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff.Input Voltage Swing		300		1800	mVpp	1
Tx Disable Input	H	VIH	2.0	Vcc+0.3	V	
	L	VIL	0	0.8		
TxFault Output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.5		
Input Diff. 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 with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.



Optical Characteristics

•Transmitter

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave.OutputPower (Enable)	Po	-9		-3	dBm	1
ExtinctionRatio	ER	8.2			dB	1
WavelengthRange	λ_c	1270	1310	1360	nm	
SpectralWidth(RMS)	$\Delta\lambda$			4	nm	
OutputOptical Eye	ITU-TG.957 Compliant					

•Receiver

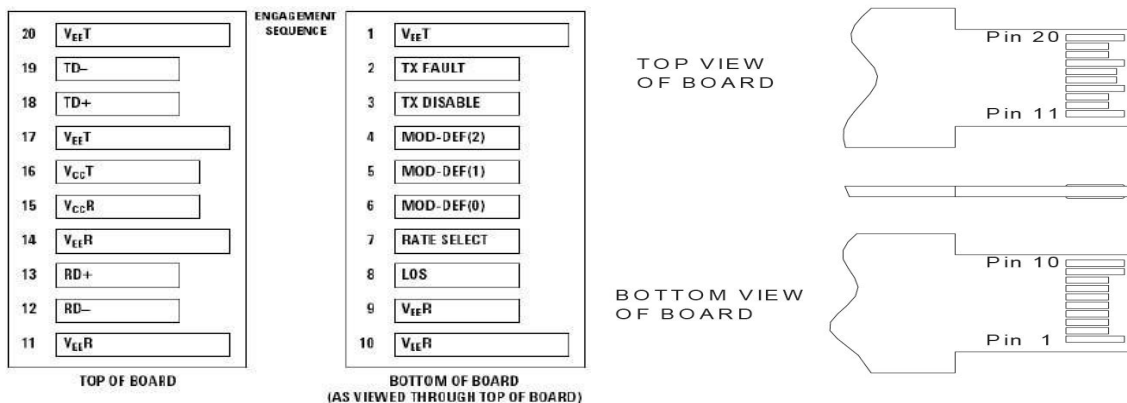
Parameter	Symbol	Min.	Type	Max.	Unit	Notes
OperatingWavelength		1270		1610	nm	
Sensitivity	Pimin			-19	dBm	3
Min. Overload	Pimax	-1			dBm	3
LOSAssert	Pa	-35			dBm	
LOSDe-assert	Pd			-21	dBm	
LOSHysteresis	Pd-Pa	0.5		6	dB	

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 2488Mb/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	Rxlossofsignal, OpenCollectorOutput, active“H”	Note4
9	VeeR	Rxground	
10	VeeR	Rxground	
11	VeeR	Rxground	
12	RD-	Inversereceiveddataout	Note5



13	RD+	Receiveddataout	Note5
14	VeeR	Rxground	
15	VccR	Rxpower supply	
16	VccT	Txpowersupply	
17	VeeT	Tx ground	
18	TD+	Transmitdatain	Note6
19	TD-	Inversetransmitdatain	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 –10KΩresistor 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 4.7–10KΩresistor. 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–10KΩ 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-Def2is the data line of two wire serial interface for serial ID

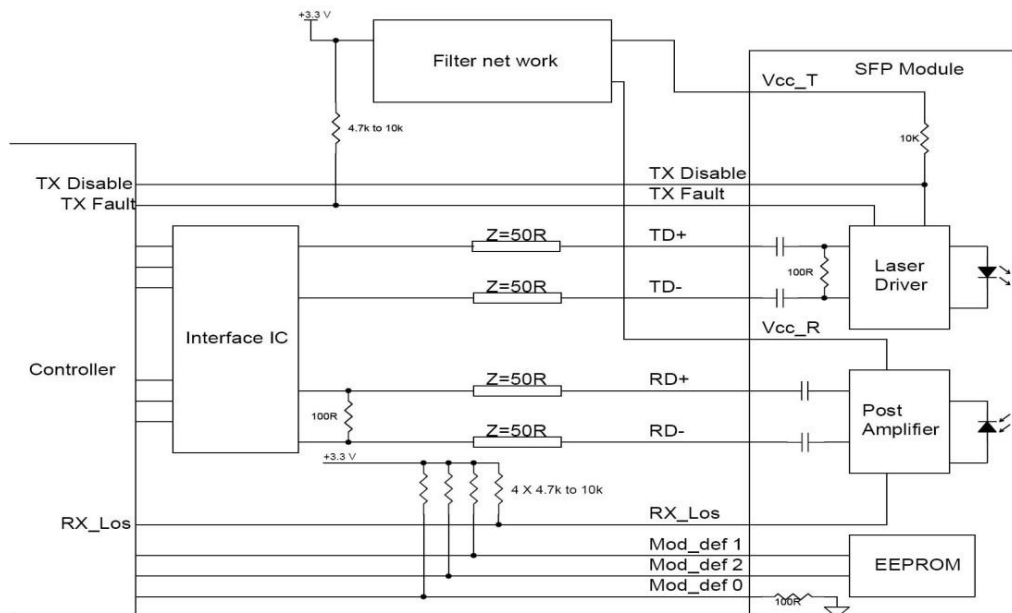
Note4)When high, this output indicates loss of signal (LOS).Low indicates normal operation.

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

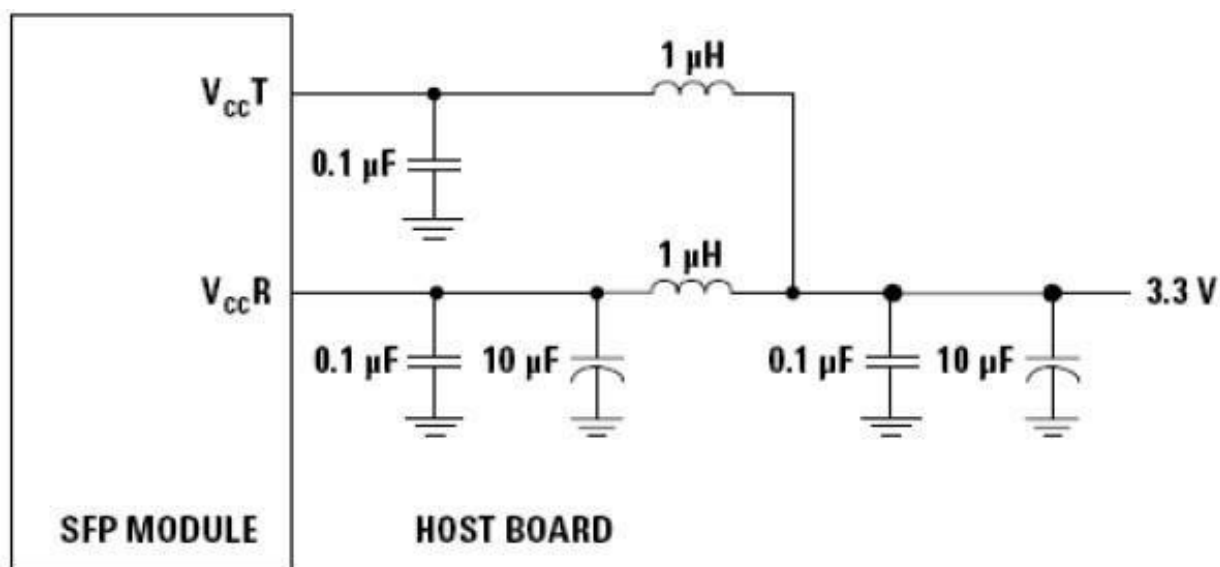
Note6)TD+/-:These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ωdifferential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.



Typical Interface Circuit



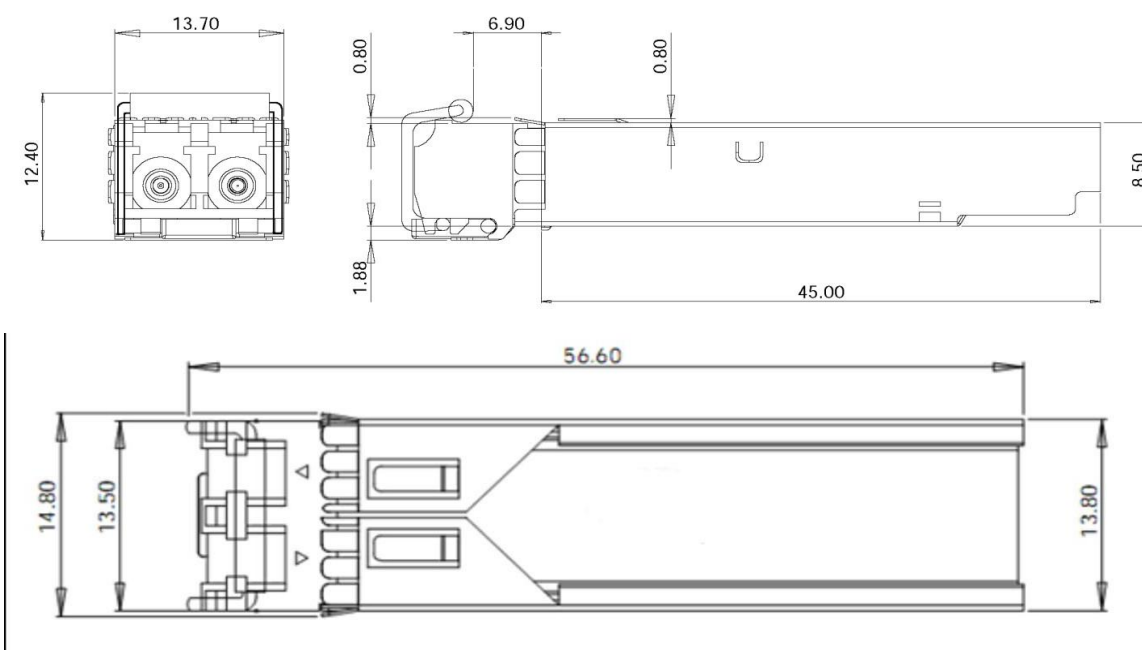
Recommended power supply filter



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

Productpart Number	Data Rate (Mbps)	Media	Wavelength (nm)	Transmission Distance(m)	Temperature Range (Tcase) (°C)	
TOP-SFP-2.5G-2C	2500	Single mode fiber	1310	2	0~70	commercial
TOP-SFP-2.5G-2E	2500	Single mode fiber	1310	2	-10~80	extended
TOP-SFP-2.5G-2I	2500	Single mode fiber	1310	2	-45~85	industrial



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