



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产品规格书

Product Specification Sheet

TOP-SFP-2.5G-MMD

RoHS Compliant 2.5Gbps 850nm 300M Multi-mode Optical Transceiver



E-MAIL: lisa@topsf.com





Product Features

- Transceiver unit with independent
- 850nm VCSEL laser transmitter and PIN photo-detector
- Up to 2.5Gbps data rate operation
- Up to 300M transmission distance at 2.5Gbps
- Standard serial ID information compliant with SFP MSA
- SFP MSA 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°C to +70°C; Extended: -10°C to +80°C; Industrial: -40°C to +85°C

Applications

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

Standard

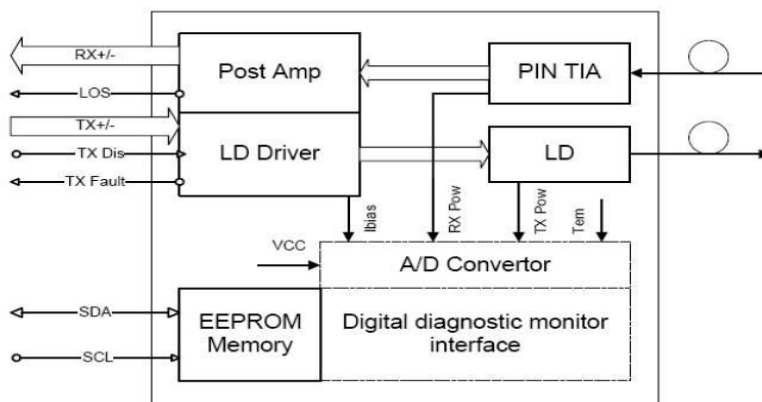
- SFP MSA (Version Sept.14 2000) compliant
- SFF-8472 (Rev 9.3, Aug. 2002) Digital Diagnostic Monitoring Interface for Optical Transceivers compliant
- IEEE 802.3z compliant
- ANSI specifications for Fiber Channel compliant
- Telcordia GR-468-CORE compliant



Description

TOP-SFP-2.5G-MMD optical transceivers is designed for GE/1 x FC optical interface for data communications with multi mode fiber (MMF). It operates at 1.25Gbps for GE. The transceiver design is optimized for high performance and cost effective to supply customers the best solutions for datacom applications.

Functional Diagram



Absolute Maximum Ratings

Parameter	Symb ol	Min.	Max	Unit	Not es
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	Gigabit Ethernet		1.25		Gh/s	



	Fiber Channel			1.0625			
Supply Voltage	Vcc	3.1	3.3	3.5	V		
Supply Current	Icc			270	mA		
Operating Case Temperature	Tc	0		70	°C		

Electrical Input/Output Characteristics

• Transmitter

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Input	Voltage		300		1600	mVpp	1
Tx Disable Input	H	VIH	2.0		Vcc+	V	
	L	VIL	0		0.8		
Tx Fault Output	H	VOH	2.0		Vcc+	V	2
	L	VOL	0		0.5		
Input Diff. Impedance		Zin		100		Ω	

• Receiver

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Output	Voltage Swing		400		1000	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

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Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave. Output Power (Enable)	Po	-9		-3	dBm	1
Total Jitter	1.25			0.431	UI	
Extinction Ratio	ER	8.2			dB	1
Rise/Fall Time (20%-80%)	Tr-Tf			0.26	ns	2
Wavelength Range		830	850	860	nm	
Spectral Width (RMS)				0.65	nm	
Output Optical Eye	Compliant with G.957(class 1 laser safety)					

● **Receiver**

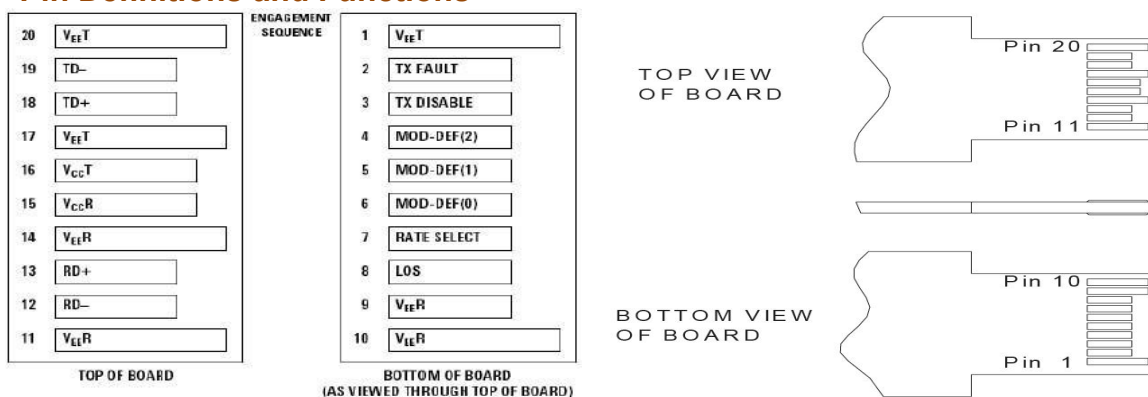
Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Operating Wavelength		770		860	nm	
Sensitivity	Pimin			-18	dBm	3
Min. Overload	Pimax	-3			dBm	3
Total Jitter	1.25G			0.749	UI	
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-20	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 2488 Mb/s with PRBS 2^{23} – 1 NRZ test pattern.

Note 2) Meet the specified maximum output jitter requirements if the specified maximum input jitter is present.

Note 3) Measured at 2488 Mb/s with PRBS 2^{23} – 1 NRZ test pattern for BER < 1×10^{-10}

Pin Definitions and Functions





PIN #	Name	Function	Notes
1	VeeT	Tx ground	
2	TxFault	Tx fault indication, Open Collector Output, active “H”	Note 1
3	TxDisable	LVTTTL Input, internal pull-up, Tx disabled on “H”	Note 2
4	MOD-	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-	2 wire serial interface clock input (SCL)	Note 3
6	MOD-	Model present indication	Note 3
7	Rate	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active “H”	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

Note 1) When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.

Note 2) 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 – 10KΩ 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

Note 3) Mod-Def 0,1,2. 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-Def 0 has been grounded by the module to indicate that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

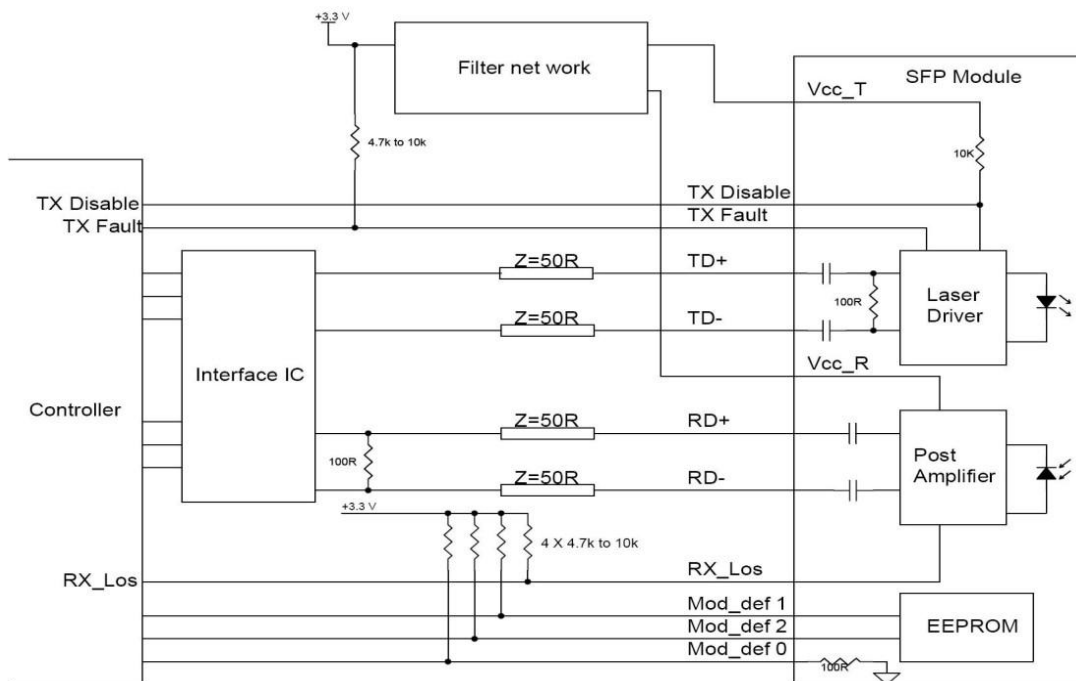
Note 4) When high, this output indicates loss of signal (LOS). Low indicates normal operation.

Note 5) 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.

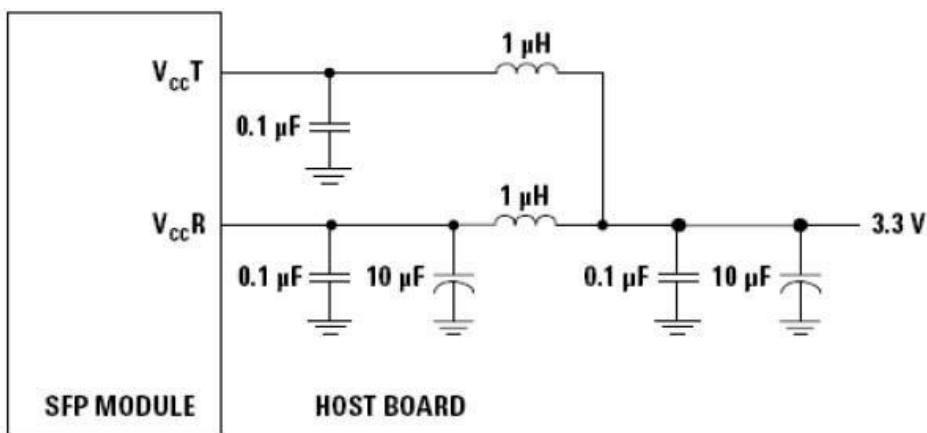
Note 6) TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.



Typical Interface Circuit



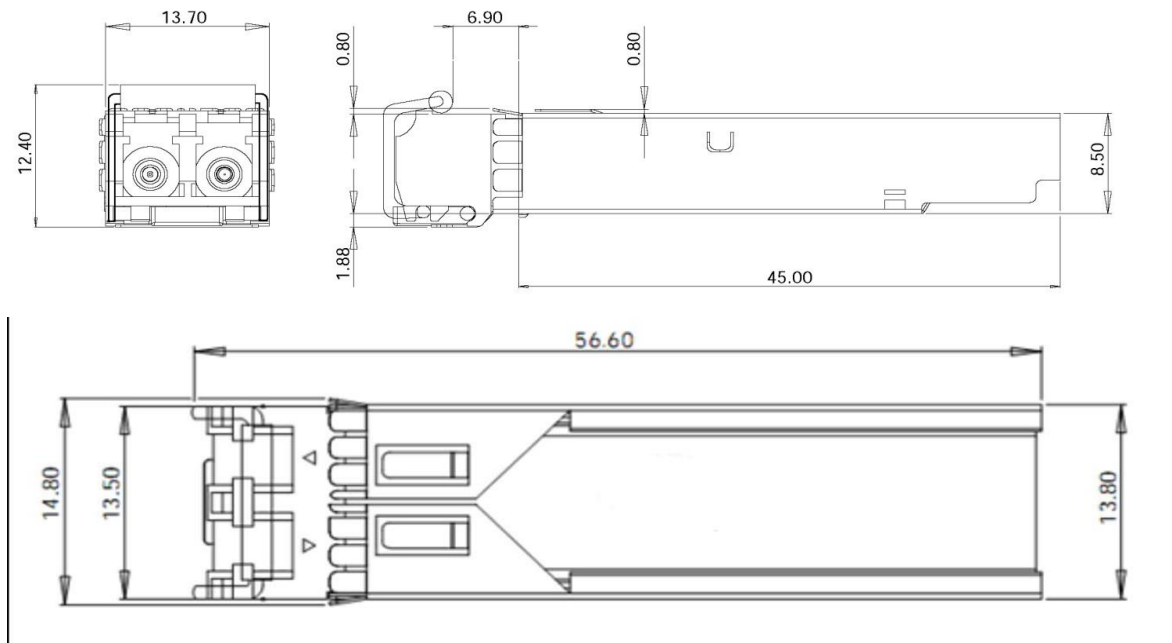
Recommended power supply filter



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-MM	Dual Fiber SFP, 2.5Gbps, 850nm, 300M, without DDM
TOP-SFP-2.5G-MMD	Dual Fiber SFP, 2.5Gbps, 850nm, 300M, with DDM



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

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

Skype: [lisalin6565](https://www.skype.com/user/lisalin6565) Whatsapp: +86 13798265065

Wechat: 251081707

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

