



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

# 产品规格书

## *Product Specification Sheet*

### TOP-SFP-155M-2D

RoHS Compliant 155Mbps 1310nm 2KM Single-mode Optical Transceiver



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### **Product Features**

- Transceiver unit with independent
- 1310nmFP Laser diode transmitter
- In Ga As PIN photo diode receiver
- Up to 155Mbps data rate operation
- Up to 2KMon50/125μmMMF, 1KMon62.5/125μm
- Standard serial ID information compliant with SFPMSA
- 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
- Other optical transmission systems

### **Standard**

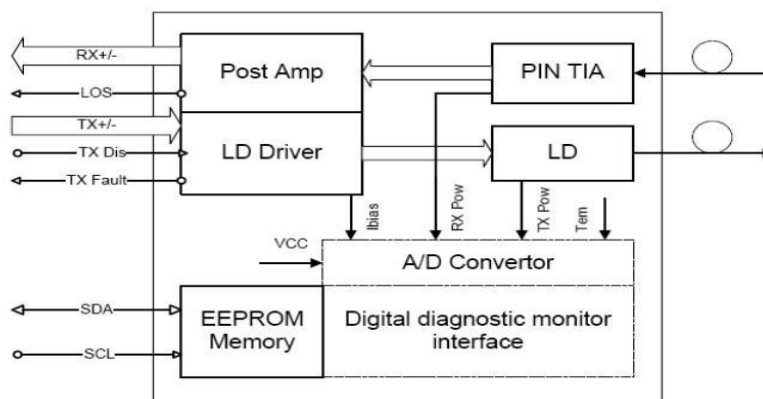
- SFPMSA(VersionSept.142000)compliant
- SFF-8472(Rev9.3, Aug.2002) Digital Diagnostic Monitoring Interface for Optical Transceivers compliant
- TelcordiaGR-253-CORECompliant
- ITU-TG.957andG.958Compliant
- TelcordiaGR-468-COREcompliant



### Description

SFP 155M 2KM 1310nm optical transceivers are designed for optical interfaces for data communications with multi mode fiber(MMF).The transceiver designs 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	
StorageTemperatur		-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			155		Mb/s	
SupplyVoltage	Vcc	3.1	3.3	3.5	V	
SupplyCurrent	Icc			270	mA	
OperatingCaseTemperat ure	Tc	0		70	°C	
		-10		80		
		-45		85		



### Electrical Input/Output Characteristics

#### • Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff.InputVoltageSwing		500		2400	mVpp	1
TxDisableInput	H	VIH	2.0	Vcc+0.	V	
	L	VIL	0	0.8		
TxFault Output	H	VOH	2.0	Vcc+0.	V	2
	L	VOL	0	0.8		
InputDiff.Impedance	Zin		100		Ω	

#### • Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff.OutputVoltageSwing		370		1800	mVpp	3
RxLOS Output	H	VOH	2.0	Vcc+0.	V	2
	L	VOL	0	0.8		

Note1)TD+/-are internally AC coupled with100Ωdifferential termination inside the module.

Note2)TxFault and RxLOS are open collector outputs,which should be pulled up with 4.7k to10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.

Note3)RD+/- outputs are internally AC coupled,and should be terminated with 100Ω(differential)at the user SERDES.

### Optical Characteristics

#### • Transmitter

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave.OutputPower	Po	-15		-8	dBm	1
ExtinctionRatio	ER	8.2			dB	1
Rise/FallTime(20%-80%)	Tr-Tf			2.5	ns	2
WavelengthRange		1270	1310	1360	nm	
SpectralWidth(RMS)				4	nm	
OutputOptical Eye	ITU G.957Compliant					

#### • Receiver

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
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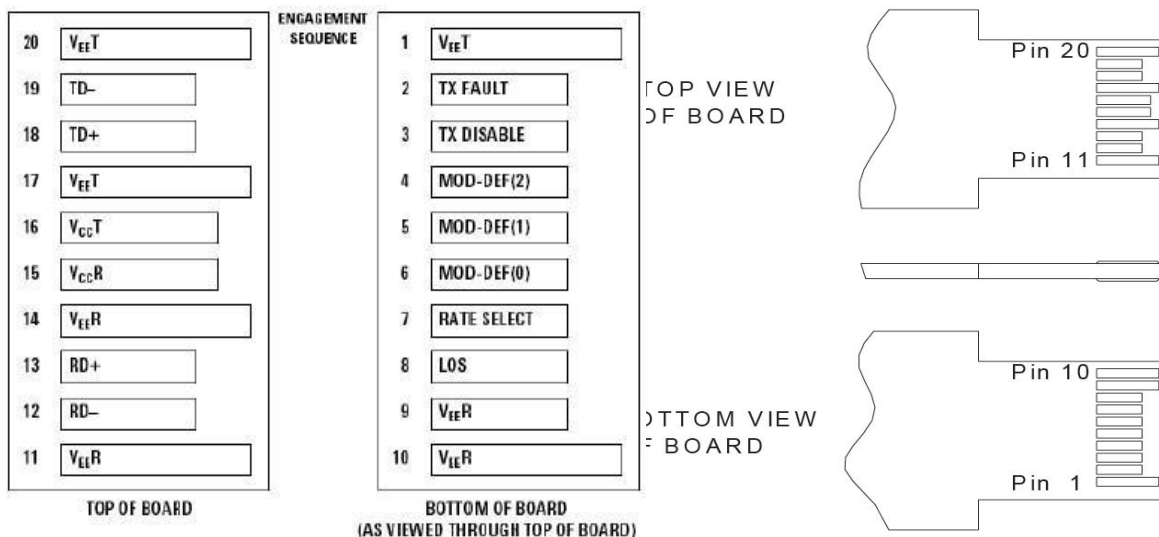
OperatingWavelength		1270		1610	nm	
Sensit	Pimin			-32	dBm	3
Min. Overload	Pimax	-8			dBm	3
LOSAssert	Pa	-45			dBm	
LOSDe-assert	Pd			-34	dBm	
LOSHysteresis	Pd-Pa	0.5		6	dB	

Note1) Measured at 155Mb/s with PRBS<sup>23</sup>-1NRZ test pattern.

Note2) Unfiltered, measured with a PRBS<sup>23</sup>-1 test pattern @155Mbps

Note3) Measured at 155Mb/s with PRBS<sup>23</sup>-1NRZ test pattern for BER < 1x10<sup>-10</sup>

### Pin Definitions and Functions



PIN #	Name	Function	Notes
1	V <sub>EE</sub> T	Tx ground	
2	Tx Fault	Txfaultindication, OpenCollectorOutput, active“H”	Note1
3	TxDisabl	LVTTLInput, internalpull-up, Txdisabledon“H”	Note2
4	MOD-	2wireserialinterfacedatainput/output(SDA)	Note3
5	MOD-	2wireserialinterfaceclockinput(SCL)	Note3
6	MOD-	Modelpresentindication	Note3
7	Ratesele	Noconnection	
8	LOS	Rxlossofsignal, OpenCollectorOutput, active“H”	Note4
9	V <sub>EE</sub> R	Rxground	
10	V <sub>EE</sub> R	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	

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.

1	T	Transmitdatain	Note6
1	T	Inversetransmitdatain	Note6
2	V	Txground	

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 – 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

Note3)Mod-Def0,1,2. These are the module definition pins. They should be pulled up with a4.7K– 10KΩresistor on the host board.The pull-up voltage shall be between 2.0V~Vcc+0.3V. Mod-Def0has been grounded by the module to indicate that the module is present  
Mod-Def1istheclock line of two wire serial interface for serial ID  
Mod-Def2 is the data line of two wire serial interface for serial ID

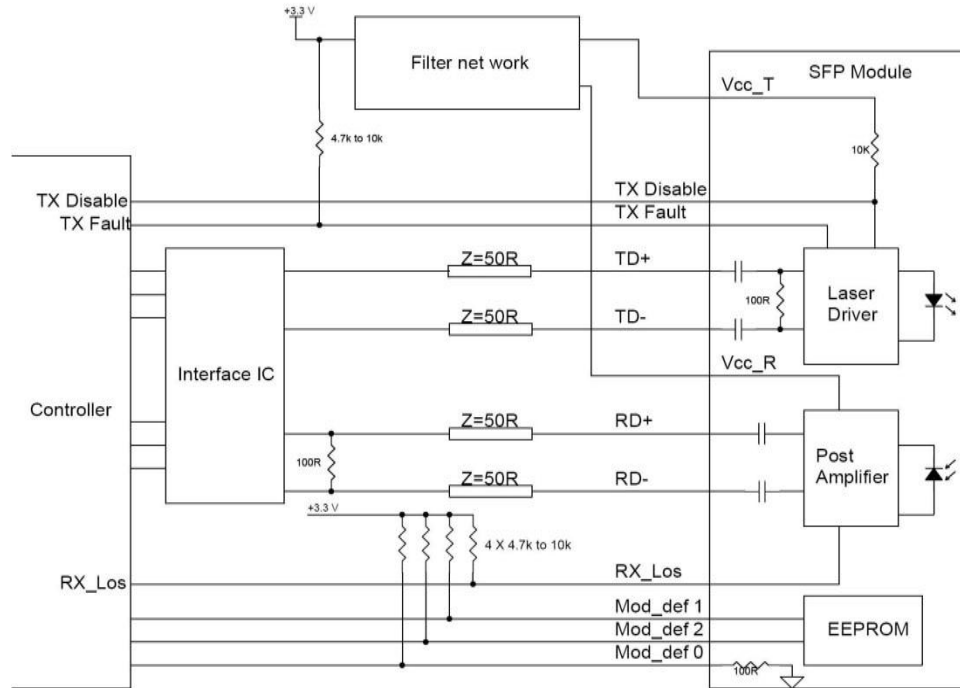
Note4)When high, this output indicates loss of signal (LOS).Low indicates normal operation.

Note5)RD+/-: These are the differential receiver outputs. They are AC coupled100Ωdifferential lines which should be terminated with100Ω(differential)at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

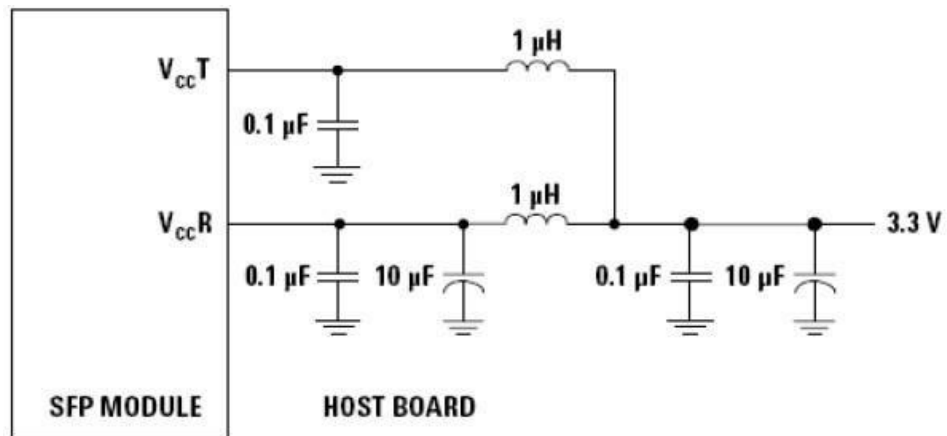
Note6)TD+/-:These are the differential transmitter inputs.They are AC-coupled, differential lines with 100Ωdifferential termination inside the module.The AC coupling is done inside the module and is thus not required on the host board.



Typical Interface Circuit



Recommended power supply filter

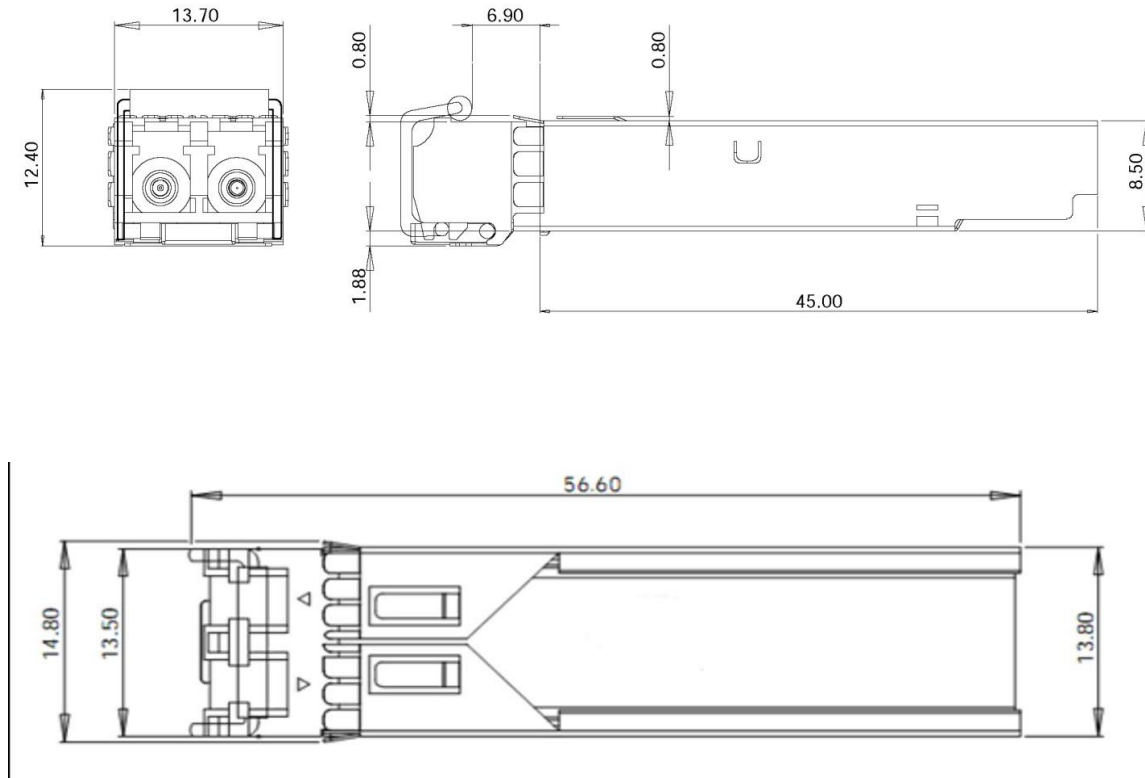


Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than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





### Package Dimensions



### Ordering Information & Related Products

TOP-SFP-155M-2	Dual Fiber SFP, 155Mbps, 1310nm, 2KM, without DDM
TOP-SFP-155M-2D	Dual Fiber SFP, 155Mbps, 1310nm, 2KM, with DDM





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