



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产品规格书

Product Specification Sheet

TOP-SFP-155M-120D

RoHS Compliant 155Mbps 1550nm 120KM Reach Optical Transceiver



E-MAIL: lisa@topsf.com





Product Features

- Up to 155Mbps data rate operation
- DFB 1550nm wavelengths laser and PIN photo detector for 120km transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- 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

Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Description

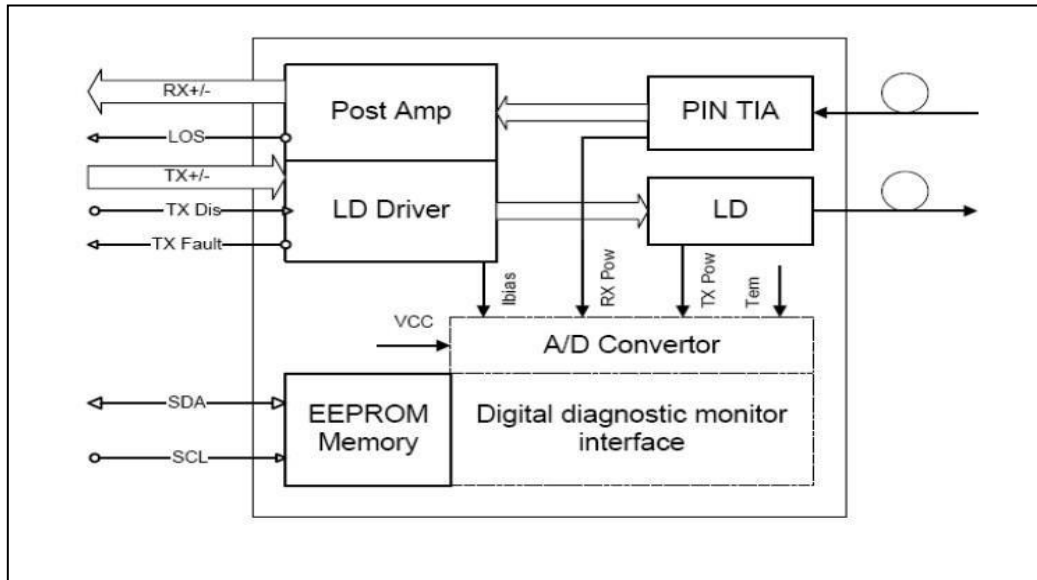
The SFP transceivers are high performance, cost effective modules supporting data-rate of 155Mbps and 120km transmission distance with SMF.

The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.



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	85	%	

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			155		Mb/s	
Supply Voltage	Vcc	3.1	3.3	3.47	V	
Supply Current	Icc			280	mA	
Operating Case Temperature	Tc	0		70	°C	

**Electrical Input/Output Characteristics****• Transmitter**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Input Voltage Swing		300		1860	mVp	1
Tx Disable Input	H	V_{IH}	2.0	$V_{CC}+0.3$	V	
	L	V_{IL}	0	0.8		
Tx Fault Output	H	V_{OH}	2.0	$V_{CC}+0.3$	V	2
	L	V_{OL}	0	0.8		
Input Diff. Impedance	Z_{in}		100		Ω	

• Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Output Voltage Swing		370		1800	mVp	3
Rx LOS Output	H	V_{OH}	2.0	$V_{CC}+0.3$	V	2
	L	V_{OL}	0	0.8		

Note 1) TD+/- are internally AC coupled with 100 Ω 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 10k Ω resistors on the host board. Pull up voltage between 2.0V and $V_{CC}+0.3V$.

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

Optical Characteristics**• Transmitter**

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave. Output Power	P_o	1		+6	dB	1
Extinction Ratio	ER	10			dB	2
Side mode Suppression	SMSR	30			dB	
Rise/Fall Time (20%-80%)	Tr-Tf			2.5	ns	
Wavelength Range		153	1550	157	nm	
Spectral Width (RMS)				4	nm	
Output Optical Eye	ITU G.957 Compliant					

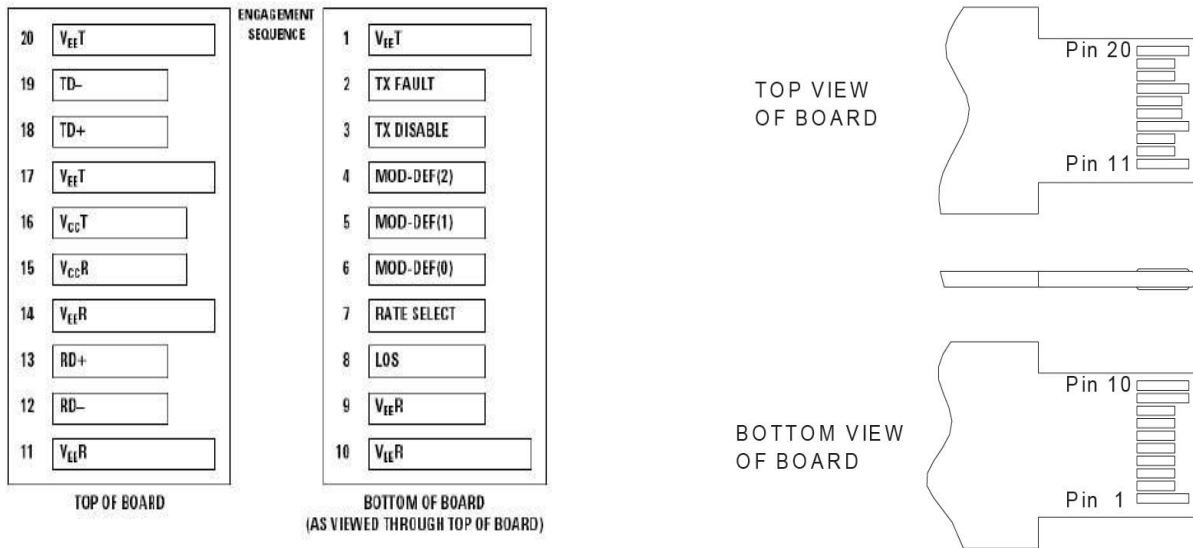


• Receiver

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Operating Wavelength		1270		1610	nm	
Sensitivity	Pimin			-38	dBm	3
Min. Overload	Pimax	-9			dBm	3
Optical Path Penalty				1	dB	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-39	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern.
 Note 2) Unfiltered, measured with a PRBS 223-1 test pattern @155Mbps
 Note 3) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern for BER < 1x10-10

Pin Definitions and Functions





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

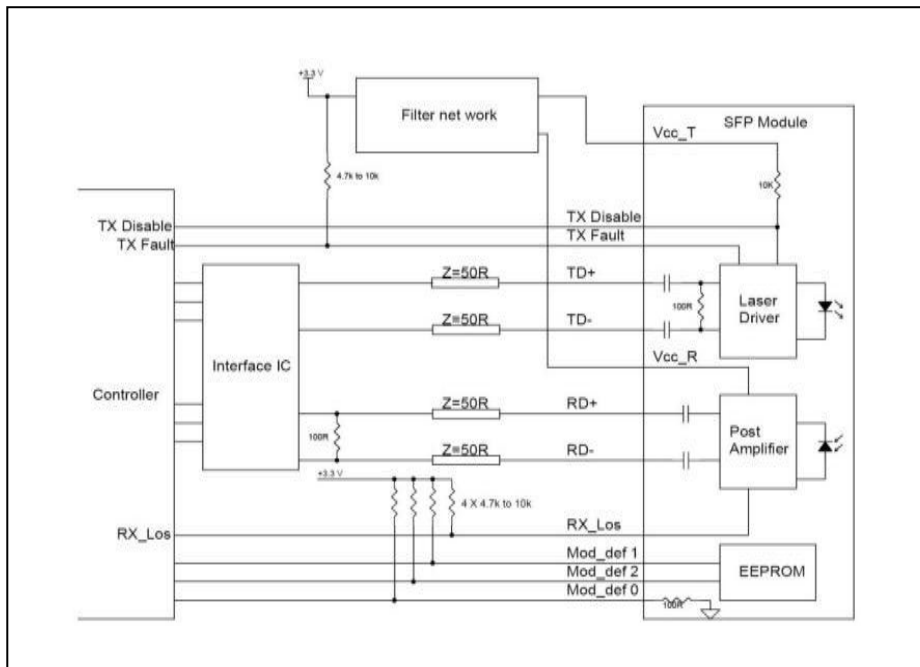


Diagnostics

Diagnostics Specification

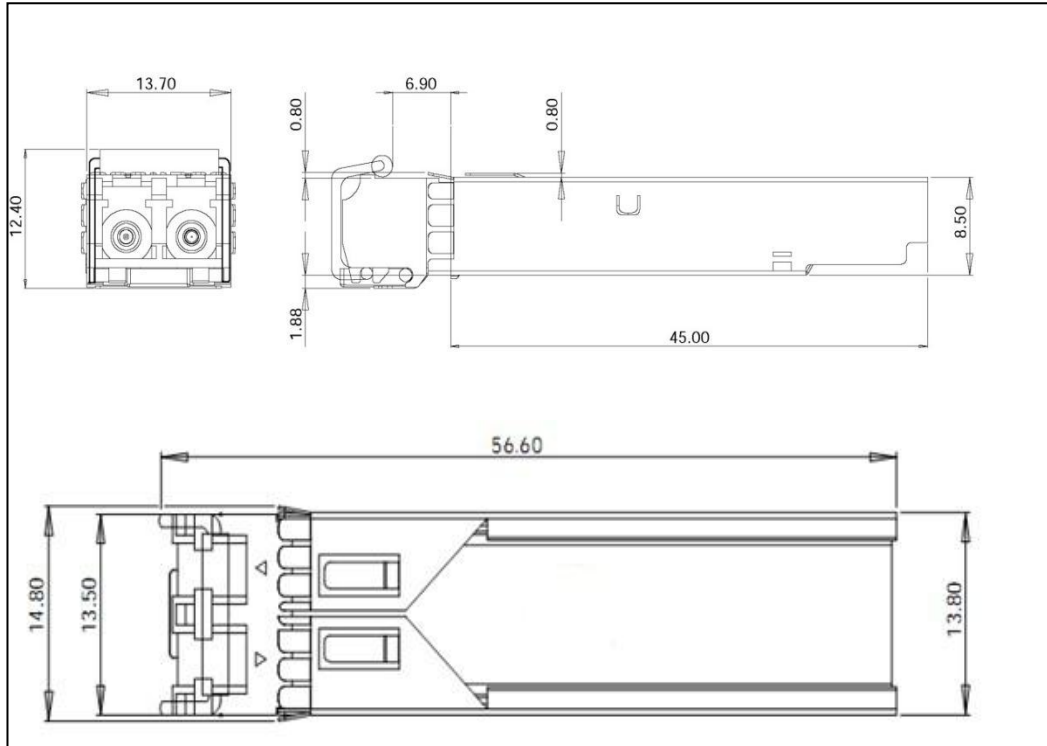
Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70 -40 to +85	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	6 to -1	dBm	±3dB	Internal/ External
RX Power	-41 to 0	dBm	±3dB	Internal/ External

Typical Interface Circuit





Package Dimensions



Ordering Information & Related Products

TOP-SFP-155M-120D	Dual Fiber SFP, 155Mbps, 1550nm, 120KM, with DDM
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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

