



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

# 产 品 规 格 书

## *Product specification sheet*

### TOP-XFP-10G-LR

RoHS Compliant 10Gb/s XFP 1310nm 10km Optical Transceiver



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## **PRODUCT FEATURES**

- Hot pluggable
- Support 9.95Gb/s to 11.1Gb/s bit rates
- Below <1W power consumption
- XFPMS A package with duplex LC connector
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- Un-cooled 1310nm DFB laser
- +3.3V single power supply
- operating temperature range 0°C to 70°C
- No reference clock requirement

## **APPLICATIONS**

- 10GBASE-LR/LW Ethernet
- SONET OC-192/SDH STM-64
- Other optical links

## **STANDARD**

- XFPMSA Compliant
- SFF-8472 revision 9.5 compliant
- IEEE 802.3-2005 compliant
- Telcordia GR-468-CORE compliant
- FCC 47 CFR Part 15, Class B compliant
- FDA 21 CFR 1040.10 and 1040.11, class 1 compliant
- RoHS compliant

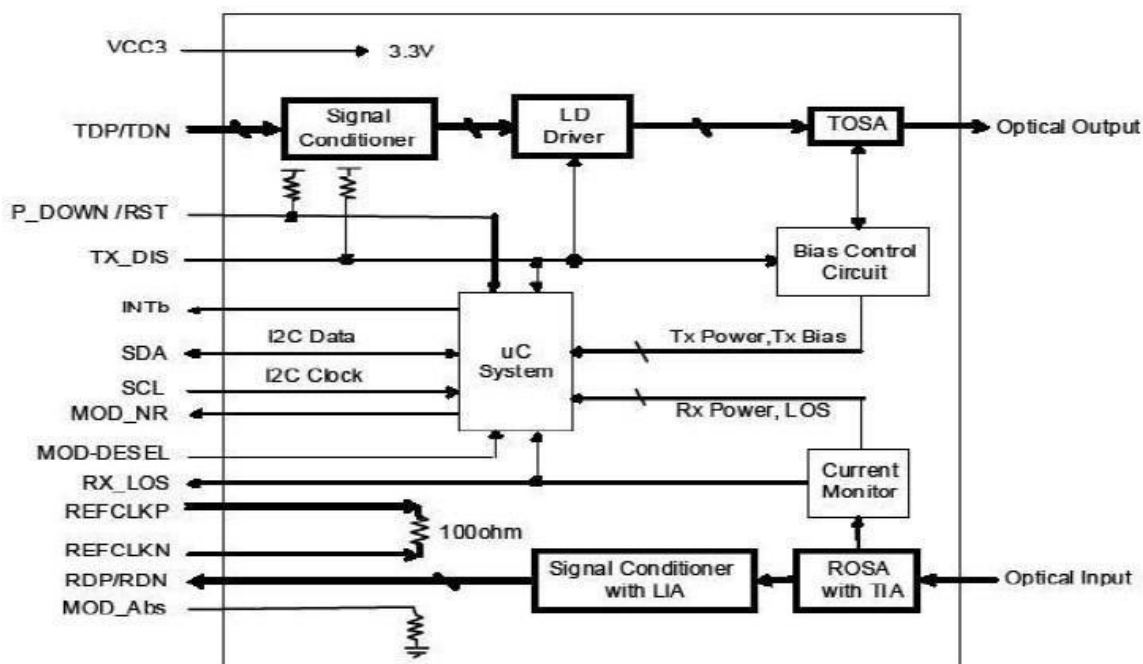


**PRODUCT DESCRIPTIONS**

XFP 10G 10KM 1310nm transceivers are de-signed for 10GEthernet10GBASE-LR/LW per 802.3ae and 10GSIOOC-192/SDHSTM-64,and it can support data-rate from 9.953Gb/s to 11.1Gb/s. Digital diagnostics are available via I2C interface as specified in the XFPMSA.

The transceiver designs are optimized for high per-formance and cost effective to supply customers the best solutions for datacom and telecom applications.

**FUNCTIONAL DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Mi	Max	Unit	Note
SupplyVoltage	Vc	-0.5	4.0	V	
StorageTemperature		-40	85	°C	
RelativeHumidity			85	%	

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



### GENERAL OPERATING CHARACTERISTICS

Paramet		Symbol	Min.	Typ	Max.	Unit	Note
DataRate	Ethernet			10.3125		Gb/s	
	FiberChannel			9.953			
SupplyVoltage		Vcc	3.14	3.3	3.46	V	
		Vcc				V	
SupplyCurrent		Icc <sub>5</sub>				mA	
		Icc <sub>3</sub>			450	mA	
OperatingCaseTemp.		Tc	0		70	°C	

### ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

#### Transmitter

Parame		Symbol	Min.	Typ	Max.	Unit	Note
Diff.inputvoltageswing			120		820	mVpp	1
TxDisableinput	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
TxFaultoutput	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
InputDiff.Impedance		Zin		100		Ω	

#### Receiver

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Diff.outputvoltageswing			340	650	800	mVpp	3
RxLOSOutput	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

Note1)TD+/-are internally AC coupled with100Ω differential 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 between2.0V and Vcc+0.3V.

Note3)RD+/- outputs are internally AC coupled, and should be terminated with100Ω(differential)at the user SERDES.



### OPTICAL CHARACTERISTICS

#### Transmitter(0~70 @10.3125Gb/s)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
OperatingWavelength		1260		1355	nm	
Ave.outputpower(Enabled)	Po	-7		0.5	dBm	1
ExtinctionRatio	ER	3.5			dB	1
RMS spectralwidth	$\Delta\lambda$			1	nm	
Rise/Falltime(20%~80%)	Tr/Tf			50	ps	2
Opticalmodulationamplitude	OMA	-3.2			dBm	
Dispersionpenalty				1	dB	
OutputOpticalEye	IEEE802.3-2005Compliant					

#### Receiver(0~70 @10.3125Gb/s)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
OperatingWavelength		1270		1600	nm	
Sensitivity	Psen			-14.4	dBm	3
Min.overload	Pimax	0.5			dBm	
LOSAssert	Pa	-30			dBm	
LOSDe-assert	Pd			-16	dBm	
LOSHysteresis	Pd-Pa	0.5		4	dB	

Note1)Measured at10.3125b/s with PRBS231-1NRZ test pattern.

Note2)20%~80%

Note3)Under the ER worst case, measured at10.3125Gb/s with PRBS231 -1NRZ test pattern for BER< 1x10-12



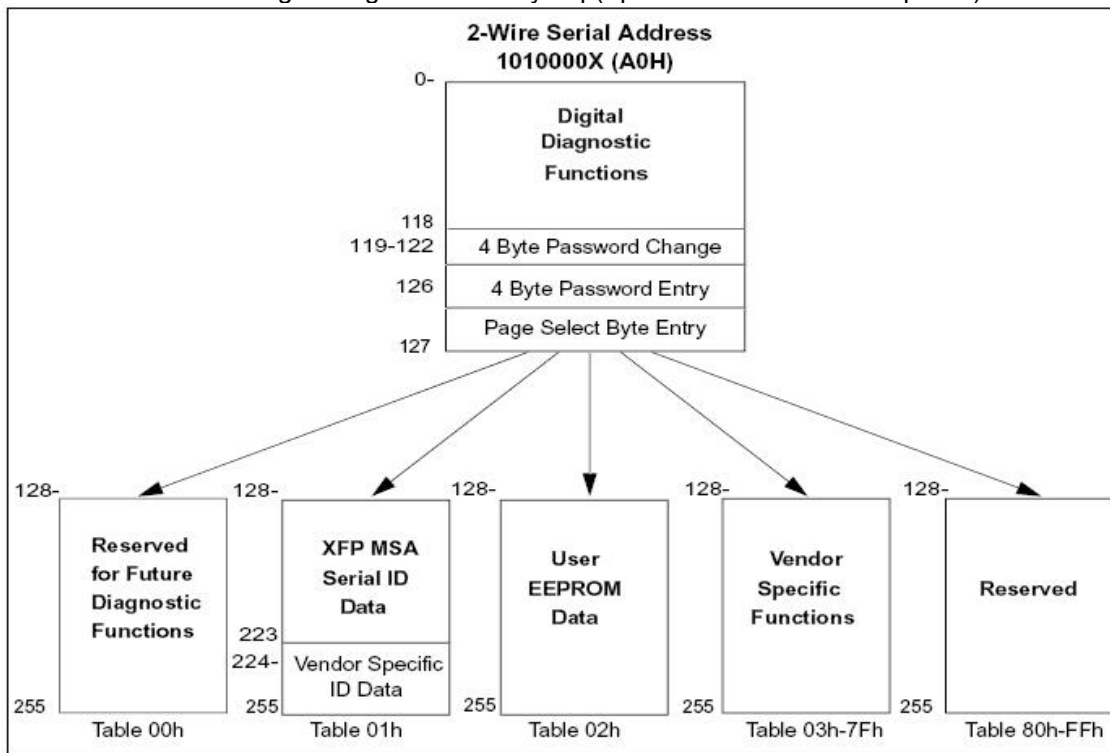
### SERIAL INTERFACE FOR ID AND DDM

The XFP modules implement the 2-wire serial communication protocol as defined in the XFP MSA.

The serial ID information of the XFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Table 1. Detailed ID information (A0h) is listed in Table 2. And the DDM specification (A2h) is described in Table 3. For more details of the memory map and byte definitions, please refer to the SFF-8472 (Rev9.3, Aug. 2002), "Digital Diagnostic Monitoring Interface for Optical Transceivers".

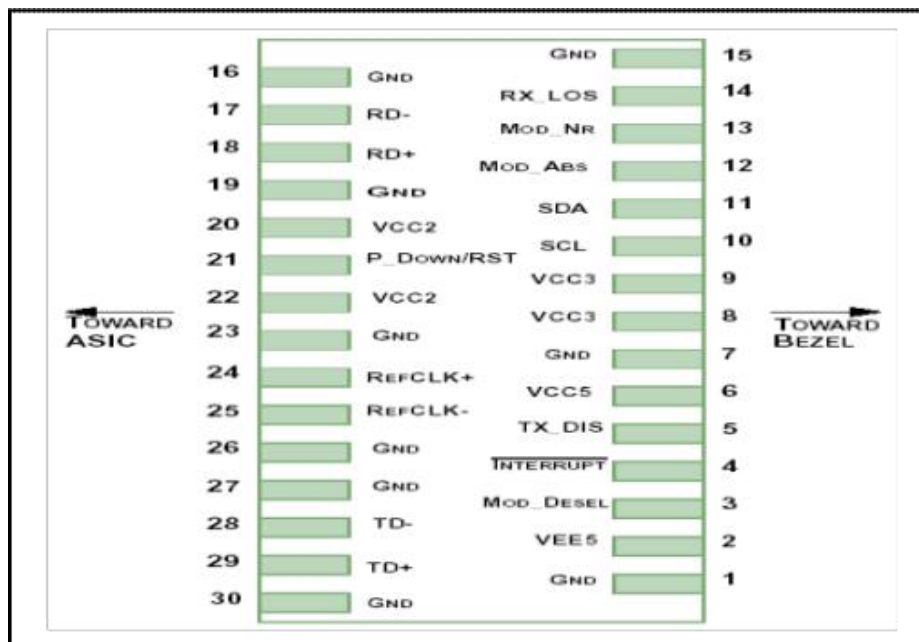
The DDM parameters have been internally calibrated.

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)





## PIN DEFINITIONS AND FUNCTIONS



PIN#	Name	Function	Name/Description	Notes
1		GND	ModuleGround	1
2		VEE5	Optional-5.2VPowerSupply (Not required)	
3	LVTTL-I	MOD_DESEL	ModuleDe-select; When held low allows the module to respond to 2-wire serial interface	
4	LVTTL-O	INTb	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5VPowerSupply(Notrequired)	
7		GND	ModuleGround	1
8		VCC3	+3.3VPowerSupply	
9		VCC3	+3.3VPowerSupply	
10	LVTTL-I/O	SCL	2-WireSerialInterface Clock	2
11	LVTTL-I/O	SDA	2-WireSerialInterface DataLine	2
12	LVTTL-O	MOD_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTL-O	MOD_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2



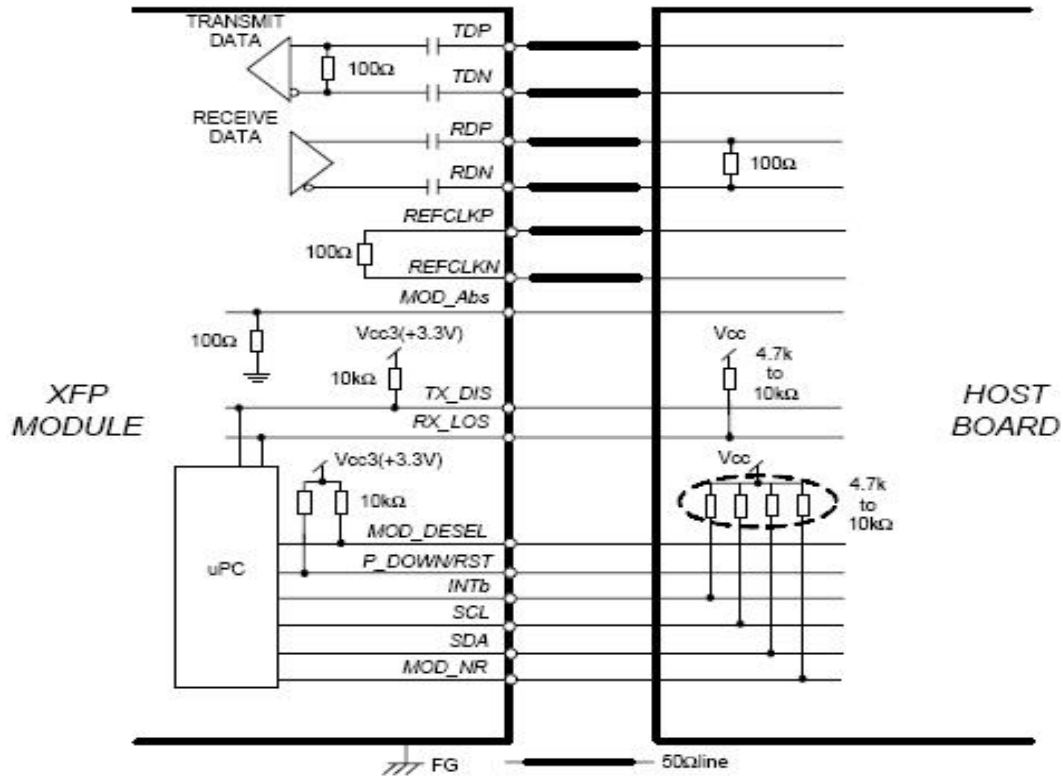
15		GND	ModuleGround	1
16		GND	ModuleGround	1
17	CML-O	RDN	ReceiverInverted DataOutput	
18	CML-O	RDP	Receiver Non-InvertedDataOutput	
19		GND	ModuleGround	1
20		VCC2	+1.8VPowerSupply(Not required).	3
21	LVTTTL-I	P_DOWN/RST	Powerdown; Whenhigh,requiresthemodule tolimitpower consumptionto1.5Worbelow.2-Wireserialinterfacemustbe functionalinthelowpower mode.	
21	LVTTTL-I	P_DOWN/RST	Reset;Thefallingedgeinitiatesacompleteresetofthe module includingthe2-wire serialinterface, equivalent toapower cycle.	
22		VCC2	+1.8VPowerSupply(Not required)	3
23		GND	ModuleGround	1
24	PECL-I	REFCLKP	Not used, internallyterminatedto50ohm (100ohm diff).	4
25	PECL-I	REFCLKN	Not used, internallyterminatedto50ohm (100ohm diff).	4
26		GND	ModuleGround	1
27		GND	ModuleGround	1
28	CML-I	TDN	TransmitterInverted DataInput	
29	CML-I	TDP	Transmitter Non-InvertedData Input	
30		GND	ModuleGround	1

Note:1.Module ground pins GND are isolated from the module case and chassis ground within the module.  
 2.Open collector; Shall be pulled up with 4.7K-10Kohms to a voltage between3.15V and 3.6V on the host board.  
 3.The pins are open within module.  
 4.Reference Clock is not required.



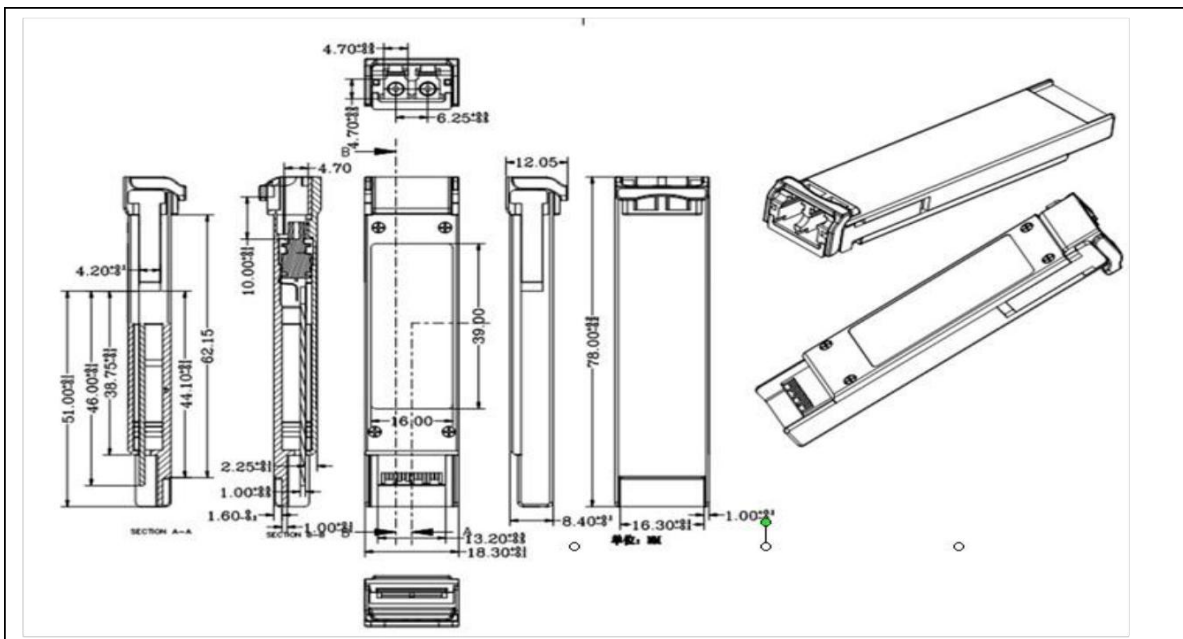


### TYPICAL INTERFACE CIRCUIT





### PACKAGE DIMENSIONS



### ORDERING INFORMATION

PartNumber	Description
TOP-XFP-10G-SR	XFP ,10.3125Gbps,850nm,300m,0~70℃,withDDM
TOP-XFP-10G-LR	XFP ,10.3125Gbps,1310nm,10km,0~70℃,with DDM
TOP-XFP-10G-ER	XFP ,10.3125Gbps,1550nm,40KM,0~70℃,withDDM
TOP-XFP-10G-ZR	XFP ,10.3125Gbps,1550nm,80KM,0~70℃,withDDM



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