TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产　品　规　格　书

Product Specification Sheet

TOP-XFP-10G-ER

RoHS Compliant 10Gb/s XFP 1550nm 40km Optical Transceiver

威星科技實業有限公司
http://www.opticalmodulemanufacturers.com

PRODUCT FEATURES

- Hot pluggable
- Support 9.95Gb/s to 11.1Gb/s bit rates
- Below<1.5W power dissipation
- XFPMSA package with duplex LC connector
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- Cooled1550nm EML laser and PINROSA
- Up to 40KM for single mode fiber
- operating temperature range0°Cto70°C
- No reference clock requirement

APPLICATIONS

- 10GBASE-ER/EW Ethernet
- SONETOC-192/SDHSTM-64
- Other optical links

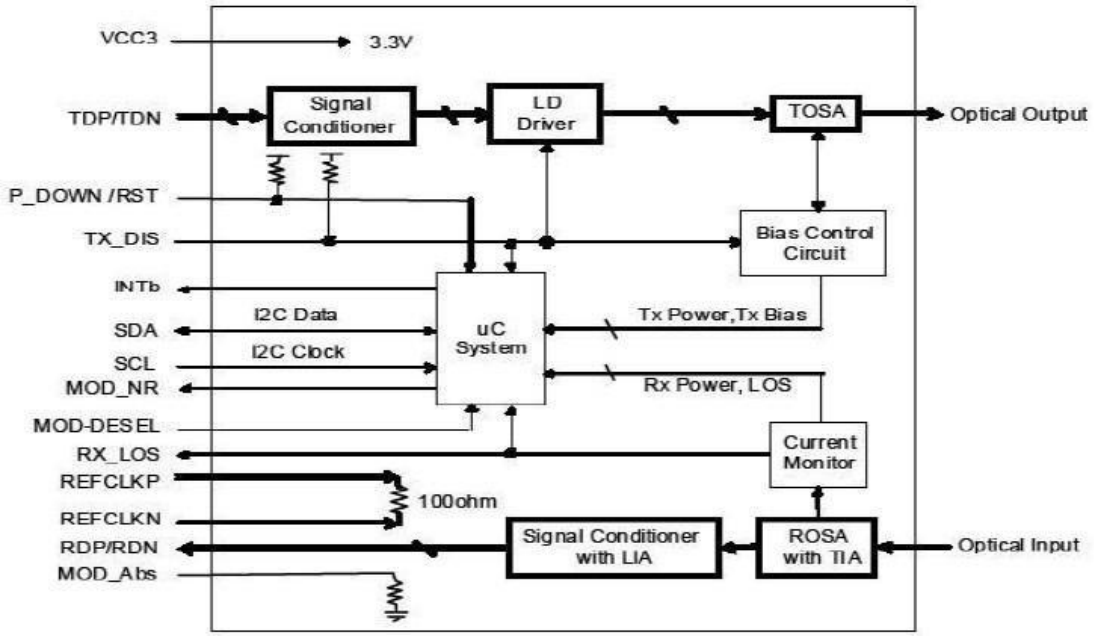
STANDARD

- XFPMSA Compliant
- SFF-8472reversion9.5compliant
- IEEE802.3-2005compliant
- Telcordia GR-468-COREcompliant
- FCC47CFRPart15,ClassBcompliant
- FDA21CFR1040.10and1040.11,class1com-pliant
- RoHS compliant

PRODUCT DESCRIPTIONS

XFP 10G 40KM 1550nm transceivers are de-signed for 10G Ethernet10GBASE-ER/EW per 802.3ae and10GSOIOC-192/SDHSTM-64,and it can support data-rate from9.953Gb/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 data-comand telecom applications.

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	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

GERERAL OPERATING CHARACTERISTICS

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet			10.3125		Gb/s	
	FiberChannel			9.953			
SupplyVoltage		Vcc	3.14	3.3	3.46	V	
		Vcc				V	
SupplyCurrent		Icc_5				mA	
		Icc_3			500	mA	
OperatingCaseTemp.		Tc	0		70	°C	

ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Transmitter

Parameter		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 andVcc+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
Operating Wavelength		1530		1565	nm	
Ave.outputpower(Enabled)	Po	-1		3	dBm	1
Extinction Ratio	ER	8.2			dB	1
RMS spectralwidth	Δλ			1	nm	
Rise/Falltime(20%~80%)	Tr/Tf			50	ps	2
Optical modulationamplitude	OMA	-2.1			dBm	
Dispersionpenalty				2	dB	
OutputOpticalEye	IEEE802.3-2005Compliant					

Receiver(0~70 @10.3125Gb/s)

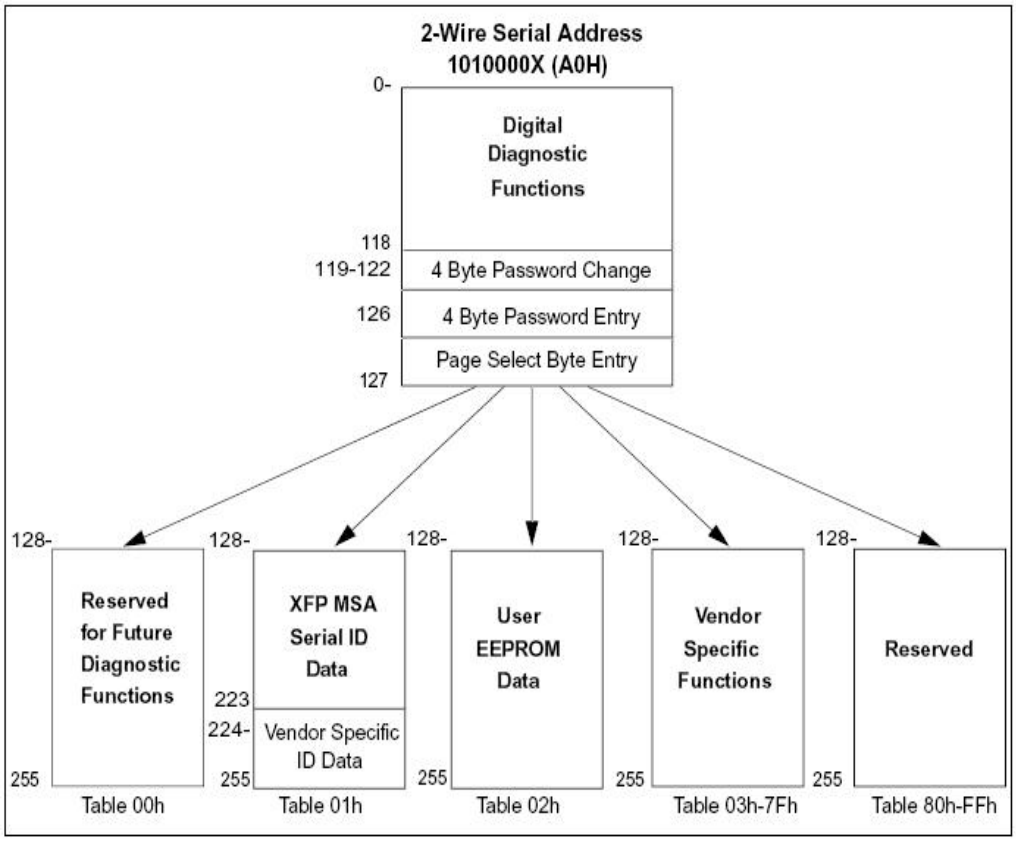
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
OperatingWavelength		1270		1600	nm	
Sensitivity	Psen			-16	dBm	3
Min.overload	Pimax	0.5			dBm	
LOSAssert	Pa	-30			dBm	
LOSDe-assert	Pd			-18	dBm	
LOSHysteresis	Pd-Pa	0.5		4	dB	

Note1)Measured at10.3125b/s with PRBS231–1NRZ test pattern.
Note2)20%~80%
Note3)Under the ER worst case, measured at 10.3125Gb/s with PRBS231 -1NRZ test pattern for BER< 1x10-12

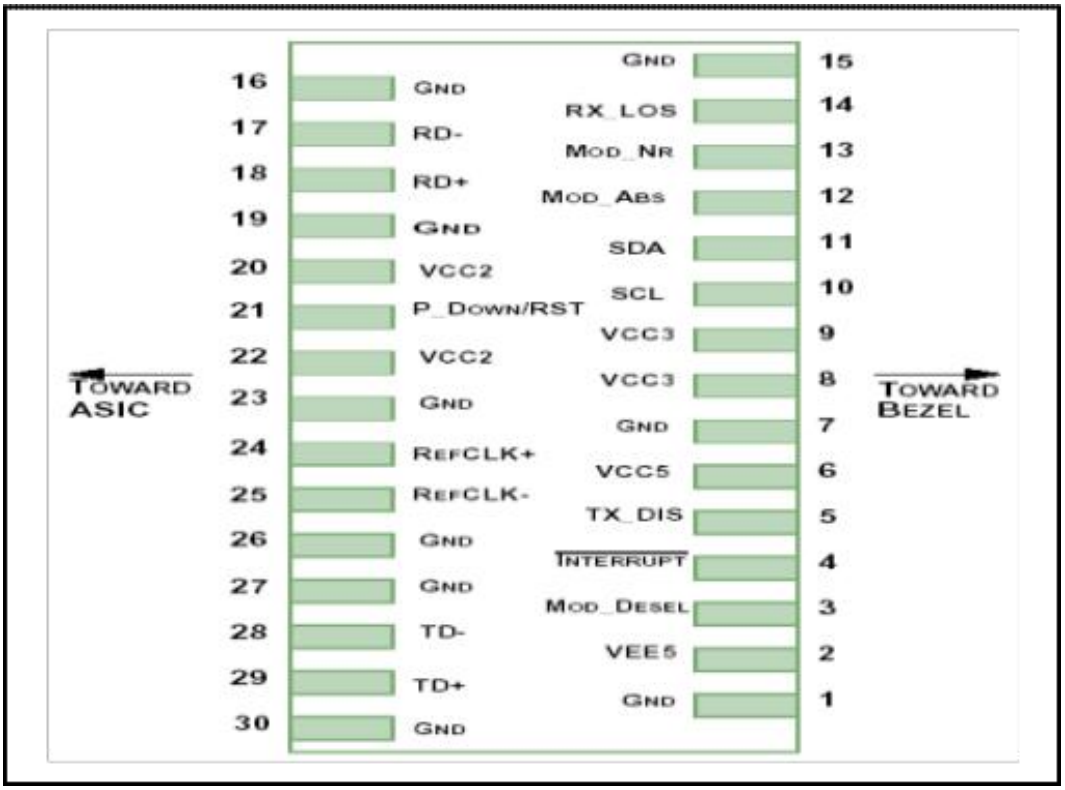
SERIAL INTERFACE FOR ID AND DDM

The XFP modules implement the 2-wire serial communication protocol as defined in the XFPMSA.The serial ID information of the XFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0handA2h. The memory is mapped in Table1. Detailed ID information (A0h) is listed inTa-ble2.And the DDM specification(A2h) is described in Table3. 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.

Table1.Digital Diagnostic Memory Map (Specific Data Field Descriptions)



PIN DEFINITIONS AND FUNCTIONS

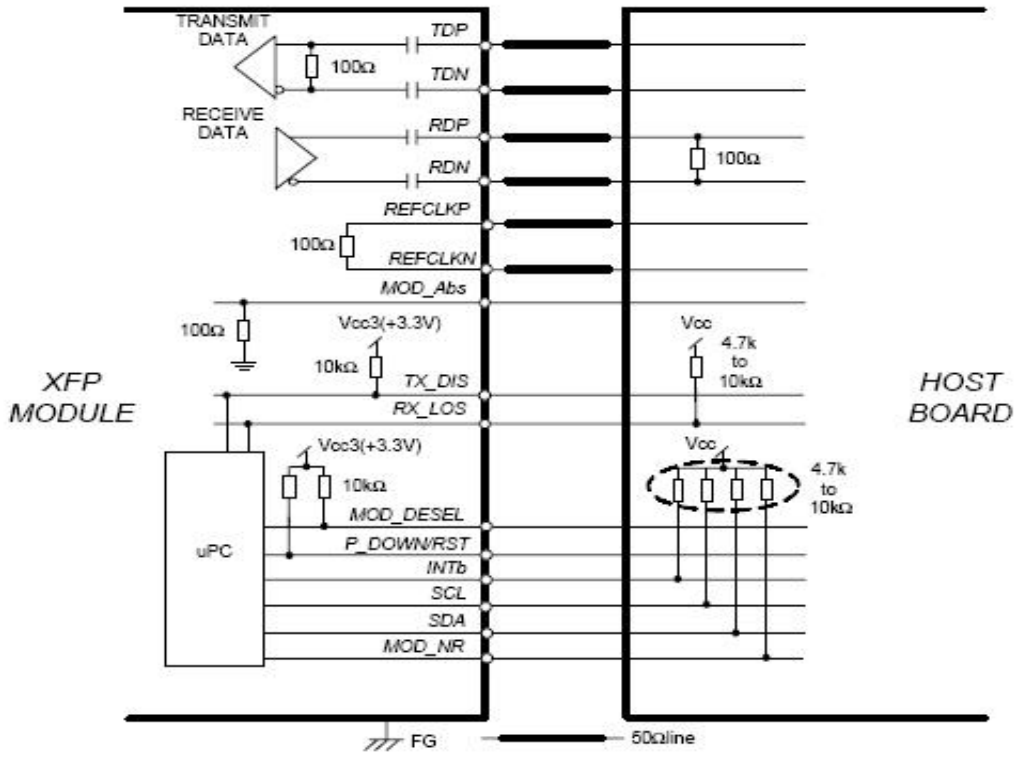


PIN#	Name	Function	Name/Description	Notes
1		GND	ModuleGround	1
2		VEE5	Optional-5.2VPowerSupply (Notrequireed)	
3	LVTTL-I	MOD_DESEL	ModuleDe-select;Whenheldlowallowsthemoduletorespond to2-wire serialinterface	
4	LVTTL-O	INTb	Interrupt;Indicatespresenceofanimportantconditio nwhichcan bereadviathe2-wireserialinterface	2
5	LVTTL-I	TX_DIS	Transmitter Disable;Turns off transmitterlaseroutput	
6		VCC5	+5VPowerSupply(Notrequired)	
7		GND	ModuleGround	1
8		VCC3	+3.3VPowerSupply	
9		VCC3	+3.3VPowerSupply	

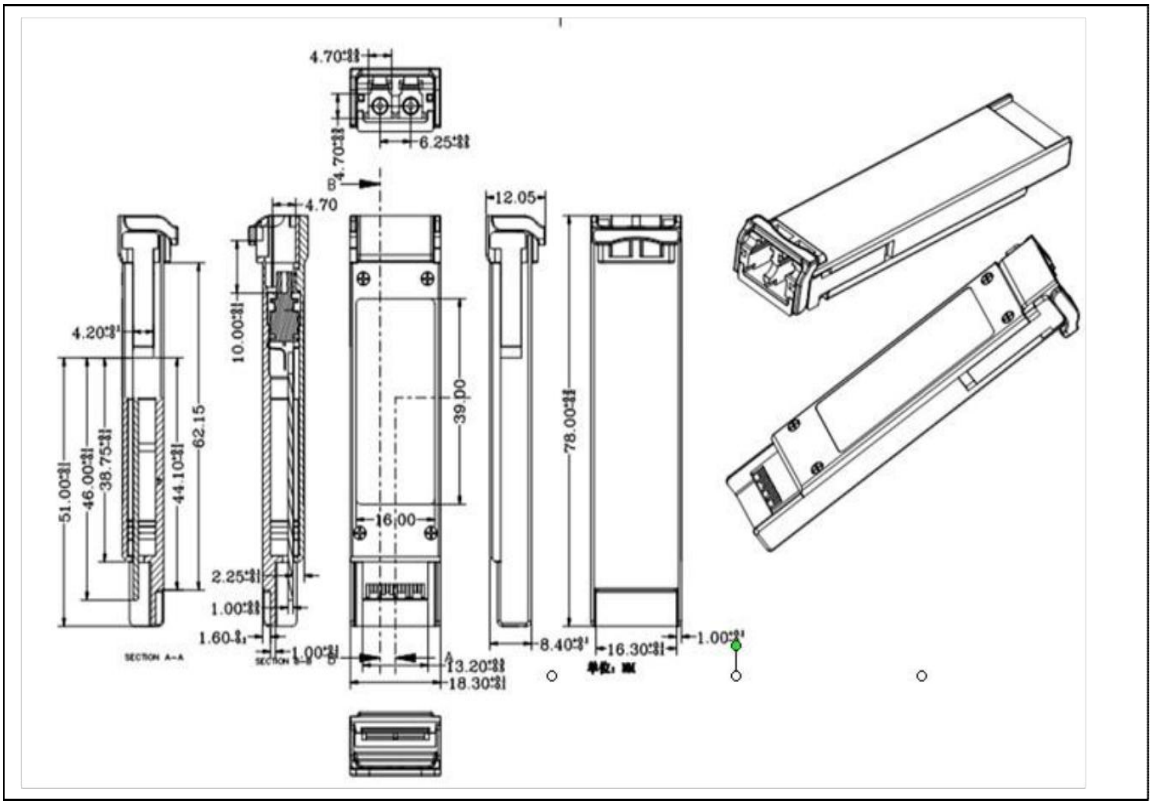
10	LVTTL-I/O	SCL	2-WireSerialInterface Clock	2
11	LVTTL-I/O	SDA	2-WireSerialInterface DataLine	2
12	LVTTL-O	MOD_Abs	Indicates Moduleis not present.Groundedin the Module	2
13	LVTTL-O	MOD_NR	Module Not Ready; IndicatingModuleOperationalFault	2
14	LVTTL-O	RX_LOS	ReceiverLoss Of SignalIndicator	2
15		GND	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	LVTTL-I	P_DOWN/RST	Powerdown; Whenhigh,requiresthemodule tolimitpower consumptionto1.5Worbelow.2-Wireserialinterfacemustbe functionalinthelowpower mode.	
21	LVTTL-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 between3.15Vand3.6V 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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