



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产 品 规 格 书

Product Specification Sheet

TOP-BIDI-XFP-ER-40B

RoHS Compliant 10Gb/s Tx1330nm/Rx1270nm 40km Optical Transceiver



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PRODUCT FEATURES

- Hot pluggable
- Support 9.95Gb/s to 11.1Gb/s bit rates
- Below <1.5w power consumption
- XFP MSA package with LC connector
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- Un-cooled 1330nmDFBlaser
- +3.3V single power supply
- operating temperature range 0°C to 70°C
- No reference clock requirement

APPLICATIONS

- 10GBASE-BX10.3125Gb/s Ethernet
- 10GBASE-BX9.953Gb/s Ethernet
- SONETOC-192 &SDH STM I-64.1

STANDARD

- XFPMSA Compliant
- SFF-8472reversion9.5compliant
- IEEE802.3-2005 compliant
- Telcordia GR-468-CORE compliant
- FCC47CFR Part15,ClassB compliant
- FDA21CFR 1040.10 and 1040.11,class1 com-pliant
- RoHS compliant

PRODUCT DESCRIPTIONS

XFP 10G 40KM 1330 transceivers are designed for 10G Ethernet 10GBASE-ER/EW per 802.3ae and 10GSOIOC-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

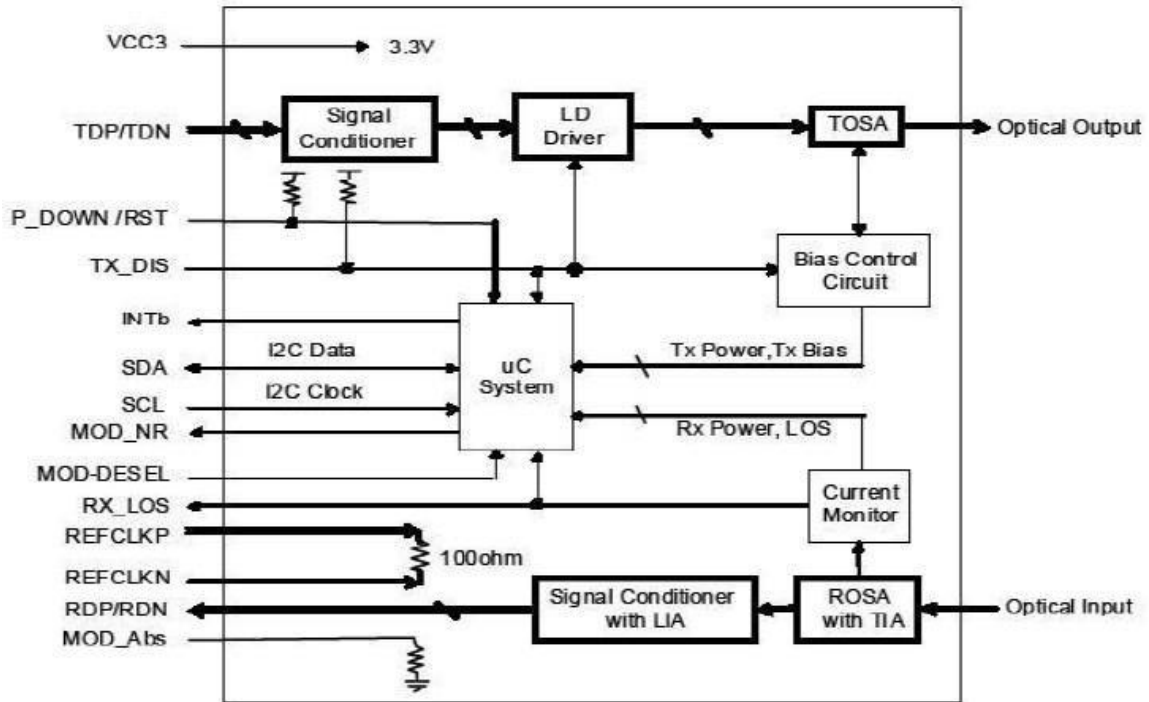
威星科技實業有限公司

<http://www.opticalmodulemanufacturers.com>



XFPMSA. The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for data-com and telecom applications.

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			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	Note
Data Rate	Ethernet			10.3125		Gb/s	
	Fiber Channel			9.953			
Supply Voltage		Vcc	3.14	3.3	3.46	V	
		Vcc				V	
Supply Current		Icc5				mA	
		Icc3			450	mA	
Operating Case Temp.		Tc	0		70	°C	

ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Transmitter

Parame		Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing			12		820	mVpp	1
Tx Disable input	H	VIH	2.		Vcc+0.3	V	
	L	VIL	0		0.		
Tx Fault output	H	VOH	2.		Vcc+0.3	V	2
	L	VOL	0		0.		
Input Diff. Impedance		Zin		10		Ω	

Receiver

Parame		Symbol	Min.	Typ	Max.	Unit	Note
Diff. output voltage swing			34	65	800	mVpp	3
Rx LOS Output	H	VOH	2.		Vcc+0.3	V	2
	L	VOL	0		0.8		

Note1)TD+/-are internally AC coupled with100Ω differential termination inside the module.

Note2)Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to10kΩ resistors on the host board. Pull up voltage between2.0VandVcc+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)

Paramete	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1320	1330	1340	nm	
Ave. output power(Enabled)	Po	-1		3	dBm	1
Extinction Ratio	ER	3.5			dB	1
RMS spectral width	$\Delta\lambda$			1	nm	
Rise/Fall time(20%~80%)	Tr/Tf			50	ps	2
Optical modulation amplitude	OMA	-5.1			dBm	
Dispersion penalty				2	dB	
Output Optical Eye	IEEE802.3-2005Compliant					

Receiver(0~70 @10.3125Gb/s)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1260	1270	1280	nm	
Sensitivity	Psen			-16	dBm	3
Min. overload	Pimax	0			dBm	
LOS Assert	Pa	-30			dBm	
LOS De-assert	Pd			-18	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note1)Measured at 10.3125b/s withPRBS231 1NRZ test pattern.

Note2)20%~80%

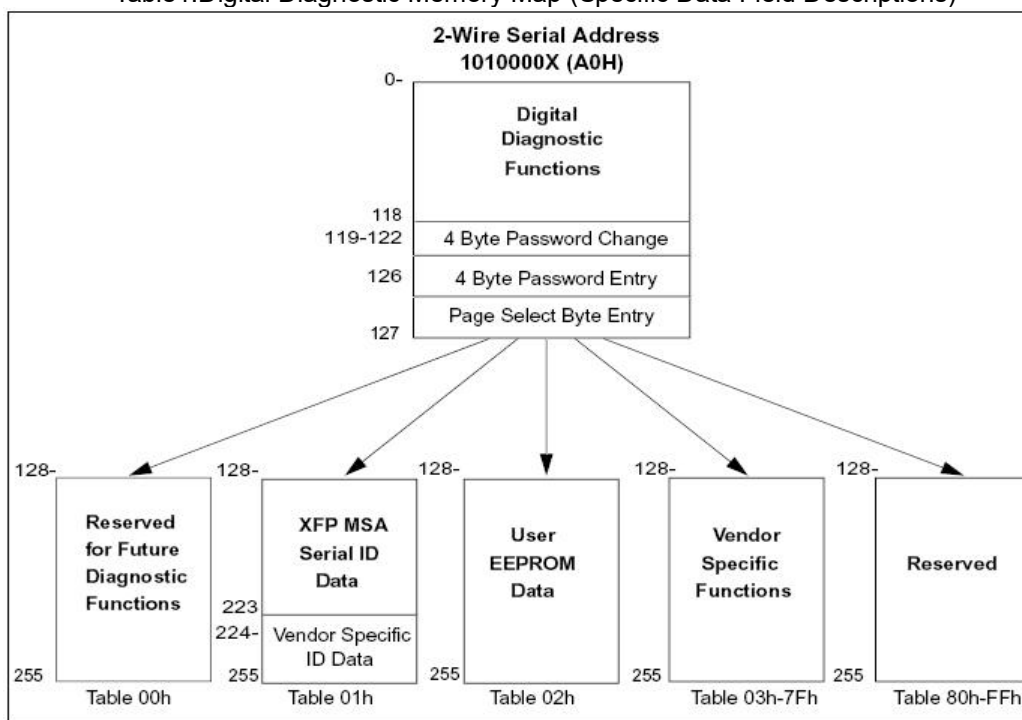
Note3)Under the ER worst case, measured at 10.3125Gb/s with PRBS231 -1NRZ test pattern for BER<1x10-12



SERIAL INTERFACE FOR ID AND DDM

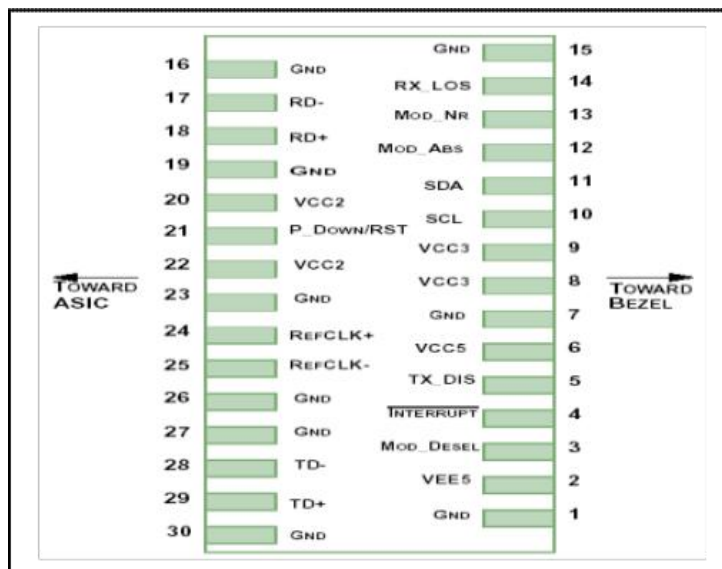
The XFP modules implement the 2-wire serial communication protocol as defined in the XFPMSA. The serial ID information of the XFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Table 1. Detailed ID information (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 (Rev 9.3, 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



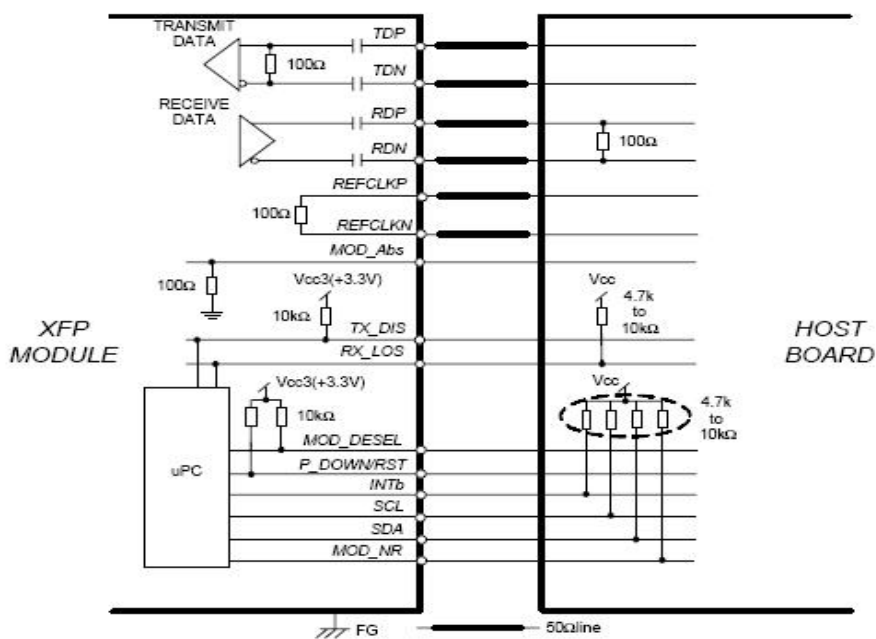
PIN#	Name	Function	Name/Descri	Notes
1		GN	Module Ground	1
2		VEE	Optional-5.2VPowerSupply (Not required)	
3	LVTTTL-I	MOD_DESEL	Module De-select; When held low allows the module to respond to 2-wire serial interface	
4	LVTTTL-O	INT b	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface	2
5	LVTTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC	+5VPowerSupply(Not required)	
7		GN	Module Ground	1
8		VCC	+3.3VPowerSupply	
9		VCC	+3.3VPowerSupply	
10	LVTTTL-I/O	SC	2-WireSerialInterface Clock	2
11	LVTTTL-I/O	SD	2-WireSerialInterface Data Line	2
12	LVTTTL-O	MOD_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTTL-O	MOD_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GN	Module Ground	1
16		GN	Module Ground	1
17	CML-O	RD	Receiver Inverted Data Output	
18	CML-O	RD	Receiver Non-Inverted Data Output	



19		GN	Module Ground	1
20		VCC	+1.8V Power Supply (Not required).	3
21	LVTTTL-I	P_DOWN/RST	Power down; When high, requires the module to limit power consumption to 1.5 W or below. 2-Wire serial interface must be functional in the low power mode.	
21	LVTTTL-I	P_DOWN/RST	Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC	+1.8V Power Supply (Not required)	3
23		GN	Module Ground	1
24	PECL-I	REFCLKP	Not used, internally terminated to 50ohm (100ohm diff).	4
25	PECL-I	REFCLKN	Not used, internally terminated to 50ohm (100ohm diff).	4
26		GN	Module Ground	1
27		GN	Module Ground	1
28	CML-I	TD	Transmitter Inverted Data Input	
29	CML-I	TD	Transmitter Non-Inverted Data Input	
30		GN	Module Ground	1

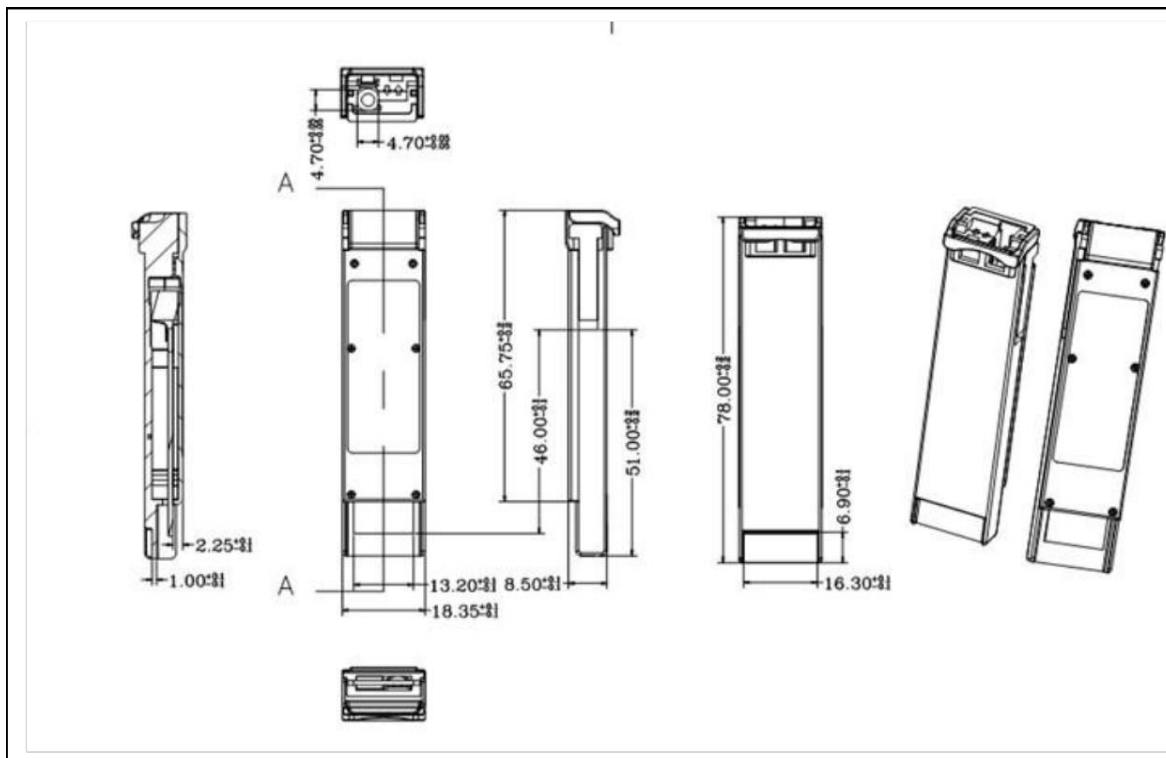
- Note: 1. Module ground pins GND are isolated from the module case and chassis ground within the module.
 2. Open collector; Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.6V on the host board.
 3. The pins are open within module.
 4. Reference C lock is not required.

TYPICAL INTERFACE CIRCUIT





PACKAGE DIMENSIONS



ORDERING INFORMATION

Part Number	Description
TOP-BIDI-XFP-20A	XFP BiDi, 10.3125Gbps, 1270nm, 20KM, 0~70°C, with DDM
TOP-BIDI-XFP-20B	XFP BiDi, 10.3125Gbps, 1330nm, 20KM, 0~70°C, with DDM
TOP-BIDI-XFP-ER-40A	XFP BiDi, 10.3125Gbps, 1270nm, 40KM, 0~70°C, with DDM
TOP-BIDI-XFP-ER-40B	XFP BiDi, 10.3125Gbps, 1330nm, 40KM, -5~70°C, with DDM
TOP-BIDI-XFP-ZR-80A	XFP BiDi, 10.3125Gbps, 1270nm, 80KM, -5~70°C, with DDM
TOP-BIDI-XFP-ZR-80B	XFP BiDi, 10.3125Gbps, 1330nm, 80KM, -5~70°C, with DDM



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