





Features

- XFP MSA Rev 4.5 compliant
- Support 10GBASE-ER application
- Up to 40km transmission on SMF
- 1550nm EML and PIN receiver
- XFI high speed electrical interface
- 2-wire interface with integrated Digital Diagnostic monitoring
- XFP MSA package with duplex LC connector
- +5V,+3.3V and +1.8V power supplies
- Power consumption less than 3.5 W
- Operating case temperature: -40~+85°C

Regulatory Compliance

Table 1 - Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge	MIL-STD-883E	Class 1(>500V for XFI
(ESD) to the Electrical Pins	Method 3015.7	pins, >2000V for other pins.)
Electrostatic Discharge (ESD) to the	IEC 61000-4-2	Competible with standards
Duplex LC Receptacle	GR-1089-CORE	Compatible with standards
Fleetramagnatia	FCC Part 15 Class B	
Electromagnetic	EN55022 Class B (CISPR 22B)	Compatible with standards
Interference (EMI)	VCCI Class B	
Immunity	IEC 61000-4-3	Compatible with standards
Logar Fue Safatu	FDA 21CFR 1040.10 and 1040.11	Compatible with Class I laser
Laser Eye Safety	EN60950, EN (IEC) 60825-1,2	product.
RoHS	2002/95/EC 4.1&4.2	Compliant with standards note
KUNS	2005/747/EC	Compliant with standards

Note:

In light of item 5 in Annex of 2002/95/EC, "Pb in the glass of cathode ray tubes, electronic components and fluorescent tubes." and item 13 in Annex of 2005/747/EC, "Lead and cadmium in optical and filter glass.", the two exemptions are being concerned for Source Photonics transceivers, because Source Photonics transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.



Absolute Maximum Ratings

Table 2 - Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	Ts	-40	-	+85	°C	
	V _{CC5}	-0.5	-	+6.0	V	
Supply Voltage	V _{CC3}	-0.5	-	+4.0	V	
	V _{CC2}	-0.5	-	+2.0	V	
Operating Relative Humidity	RH	-	-	+85	%	

Recommended Operating Conditions

Table 3 – Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _C	-40	-	+85	°C	
	V _{CC5}	4.75	5.0	5.25	V	
Power Supply Voltage	V _{CC3}	3.14	3.3	3.46	V	
	V _{CC2}	1.71	1.8	1.89	V	
	I _{CC5}	-	-	500	mA	
Power Supply Current	I _{CC3}	-	-	750	mA	
	I _{CC2}	-	-	1000	mA	
Power Dissipation	P_{D}	-	-	3.5	W	3
Bit Rate	BR	-	10.3125	-	Gbps	
Transmission Distance	TD	2	-	40,000	m	1

Note 1: Measured with G.652 SMF.

Optical Characteristics

Table 4 – Optical Characteristics

	Tra	ansmitter				
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	λ_{C}	1530	-	1565	nm	
Average Output Power	P _{0UT}	-4.7	-	4.0	dBm	1
Optical Modulation Amplitude	OMA	-1.7	-	-	dBm	1
Average Output Power (Laser Off)	P _{0UT-OFF}	-	-	-30	dBm	1
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	3.0	-	-	dB	2
Transmitter and Dispersion Penalty	TDP	-	-	3.0	dB	2



Optical Return Loss Tolerance	ORLT	-	-	21	dB	
Optical Eye Mask		Compliant v	with IEEE 802	2.3-2005		2
	R	eceiver				
Center Wavelength Range	λ _C	1530	-	1565	nm	
Receiver Sensitivity	P _{IN-SENS}	-	-	-16	dBm	3
Receiver Sensitivity in OMA	P _{IN-SENS(OMA)}	-	-	-14.1	dBm	3
Receiver Overload	P _{IN-OL}	-1.0	-	-	dBm	3
Receiver Reflectance	Ref	-	-	-26	dB	
LOS Assert	LOS _A	-25	-		dBm	
LOS Deassert	LOS _D	-	-	-17	dBm	
LOS Hysteresis	LOS _H	0.5	-	4	dB	

Notes:

- 1. The optical power is launched into SMF.
- 2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps.
- 3. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps, BER≤10⁻¹².

Electrical Characteristics

Table 5 – Electrical Characteristics

Transmitter Transmitter						
Parameter	Symbol	Min.	Typical	oical Max.		Notes
Differential Data Input Amplitude	$V_{IN,P-P}$	120	-	820	mVpp	
Input Differential Impedance	Z _{IN}	85	100	115	Ω	
T. Diville D. D. (DOT	V_{IL}	-0.3	-	0.8	V	
Tx_Disable, P_Down/RST	V _{IH}	2.0	-	V _{CC} +0.3	V	
	1	Receiver				
Differential Date Output Amplitude	$V_{OUT,P-P}$	340	-	850	mVpp	
Output Differential Impedance	Z_d	80	100	120	Ω	
Output Rise Time, 20%~80%	T_R	24	-	-	ps	
Output Fall Time, 20%~80%	T _F	24	-	-	ps	
Dy LOS Mad ND Interrupt	V _{OL}	0	-	0.4	V	
Rx_LOS, Mod_NR, Interrupt	V_{OH}	V _{CC} -0.5	-	V _{CC} +0.3	V	



Recommended Host Board Power Supply Circuit

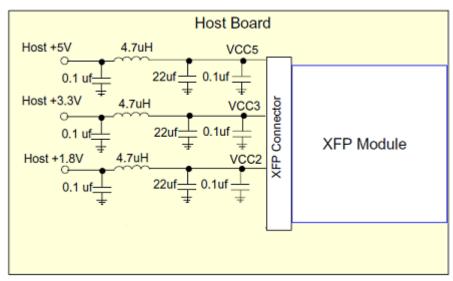


Figure 1, Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

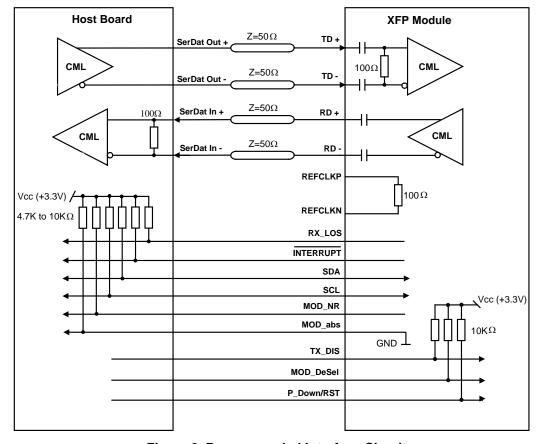


Figure 2, Recommended Interface Circuit



Pin Definitions

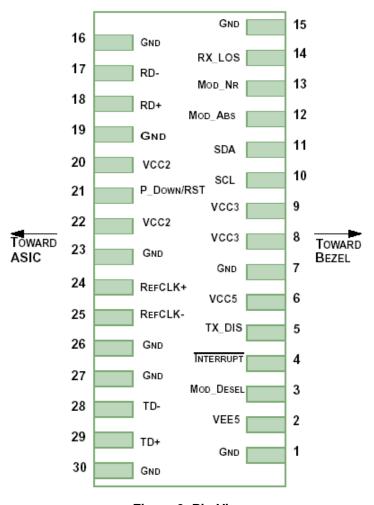


Figure 3, Pin View

Table 6 – Electrical Characteristics

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	
2		V_{EE5}	Optional -5.2V Power Supply (Not implemented)	3
3	LVTTL-I	Mod_Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface	
4	LVTTL-O	Interrupt	Interrupt; Indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		V_{CC5}	+5V Power Supply	
7		GND	Module Ground	1
8		V _{CC3}	+3.3V Power Supply	
9		V _{CC3}	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	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	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		V _{CC2}	+1.8V Power Supply	
21	LVTTL-I	P_Down/RST	Power down; When high, requires the module to limit power	
			consumption to 1.5W or below. 2-Wire serial interface must	
			be functional in the low power mode.	
			Reset; The falling edge initiates a complete reset of the	
			module including the2-wire serial interface, equivalent to a	
			power cycle.	
22		V _{CC2}	+1.8V Power Supply	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Not used, internally terminated to 50ohm (100ohm diff).	4
25	PECL-I	RefCLK-	Not used, internally terminated to 50ohm (100ohm diff).	4
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

Notes:

- 1. Module ground pins GND are isolated from the module case and chassis ground within the module.
- 2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.
- 3. The pins are open within module.
- 4. Reference Clock is not required



Mechanical Diagram

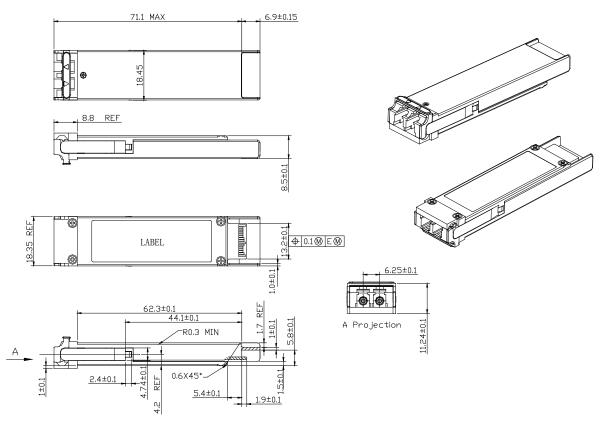


Figure 4, Mechanical Diagram of XFP

Order Information

Table 7 – Order Information

Part No.	Application	Data Rate	Laser Source	Fiber Type	Latch Color
XP-XE-04-IDFA	10GBASE-ER	10.3125G	1550nm EML	SMF	Red

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures. **Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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