

XFP 10G Bi-Di Transceiver

SOXPB-2399-40

Features :

- Support 10GBASE-LR/10GBASE-LW/10G Fiber Channel application
- XFP MSA Rev 4.5 compliant
- Multi rate of up to 11.3Gbps
- Transmission distance up to 10km and 40KM
- +3.3V single power supply
- Low power consumption
- Operating case temp : 0~+70°C
- RoHS 6/6 compliant

Absolute Maximum Ratings

Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V _{CC3}	-0.5	-	+3.6	V	
Storage Temperature	T _s	0	-	+70	°C	
Operating Humidity	RH	+5	-	+95	%	

Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _C	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V	
Power Supply Current	I _{CC}	-	-	450	mA	
Power Dissipation	P _d	-	-	1.5	W	
Bit Rate	BR	-	10.3125	-	Gbps	

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Electrical Characteristics

Table 3- Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes	
Transmitter							
Differential Data Input Swing	$V_{in,P-P}$	120	-	850	mV _{PP}		
Input Differential Impedance	Z_{IN}	80	100	120	Ω		
Tx_Fault	Normal Operation	V_{OL}	0	-	+0.4	V	
	Transmitter Fault	V_{OH}	2.0	-	V_{CC}	V	
Tx_Disable	Normal Operation	V_{IL}	0	-	+0.8	V	
	Laser Disable	V_{IH}	2.0	-	$V_{CC}+0.3$	V	
Receiver							
Differential Date Output	V_{out}	100	-	860	mV		
Output Differential Impedance	Z_D	80	100	120	Ω		
Output Rise Time(20-80%)	T_R	20	-	-	ps		
Output Fall Time (20-80%)	T_F	20	-	-	ps		
Rx_LOS	Normal Operation	V_{OL}	0	-	+0.4	V	
	Lose Signal	V_{OH}	2.0	-	V_{CC}	V	

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Optical Characteristics

Table 4-Optical Characteristics

SOXPB-2399-20 (10G Bi-Di 1270 TX 1330 RX 10KM-20KM)

SOXPB-3299-20 (10G Bi-Di 1330 TX 1270 RX 10KM-20KM)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	9.95	10.3125	11.3	
Center Wavelength Range	λ_c	nm	1250	1270	1290	SOCX-2396-10L
			1310	1330	1350	SOCX-3296-10L
Average Launch power Tx_off	P _{off}	dBm	-	-	-45	
Launch Optical Power	P ₀	dBm	-7.5	-	0	1
Extinction Ratio	EX	dB	3.8	-	-	
Jitter P-P	JP	ps	-	-	20	
Jitter RMS	JR	ps	-	-	5	
Optical Rise/Fall time	Tr/tf	ps	20	-	100	
Eye Diagram	Compliant With IEEE 802.3-2005					
Optical receiver Characteristics						
Bit Rate	BR	Gbps	9.95	10.3125	11.3	
Receiver Sensitivity	RS	dBm	-	-	-14	2
Overload Input Optical Power	P _{IN}	dBm	0	-	-	2
Center Wavelength Range	λ_c	nm	1310	1330	1350	SOCX-2396-10L
			1250	1270	1290	SOCX-3296-10L
LOS	LOS _D	dBm	-	-	-15	
	LOS _A		-24.5	-	-	
LOS Hysteresis		dB	0.5	-	-	

SOXPB-2399-40 (10G Bi-Di 1270 TX 1330 RX 20KM-40KM)

SOXPB-3299-40 (10G Bi-Di 1330 TX 1270 RX 20KM-40KM)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	9.95	10.3125	11.3	
Center Wavelength Range	λ_c	nm	1250	1270	1290	SOCX-2396-40L
			1310	1330	1350	SOCX-3296-40L

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Average Launch power Tx_off	P _{off}	dBm	-	-	-45	
Launch Optical Power	P ₀	dBm	1	-	6.5	1
Extinction Ratio	EX	dB	3.8	-	-	
Jitter P-P	JP	ps	-	-	20	
Jitter RMS	JR	ps	-	-	5	
Optical Rise/Fall time	Tr/tf	ps	20	-	100	
Eye Diagram	Compliant With IEEE 802.3-2005					
Optical receiver Characteristics						
Bit Rate	BR	Gbps	9.95	10.3125	11.3	
Receiver Sensitivity	RS	dBm	-	-	-14	2
Overload Input Optical Power	P _{IN}	dBm	0	-	-	2
Center Wavelength Range	λ_c	nm	1310	1330	1350	SOCX-2396-40L
			1250	1270	1290	SOCX-3296-40L
LOS	LOS _D	dBm	-	-	-15	
	LOS _A		-24.5	-	-	
LOS Hysteresis		dB	0.5	-	-	

Note:

1. Coupled into 9/125 SMF.
2. Measured with PRBS 2³¹-1 test pattern @10.3125Gbps.BER=10E-12

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Recommended Interface Circuit

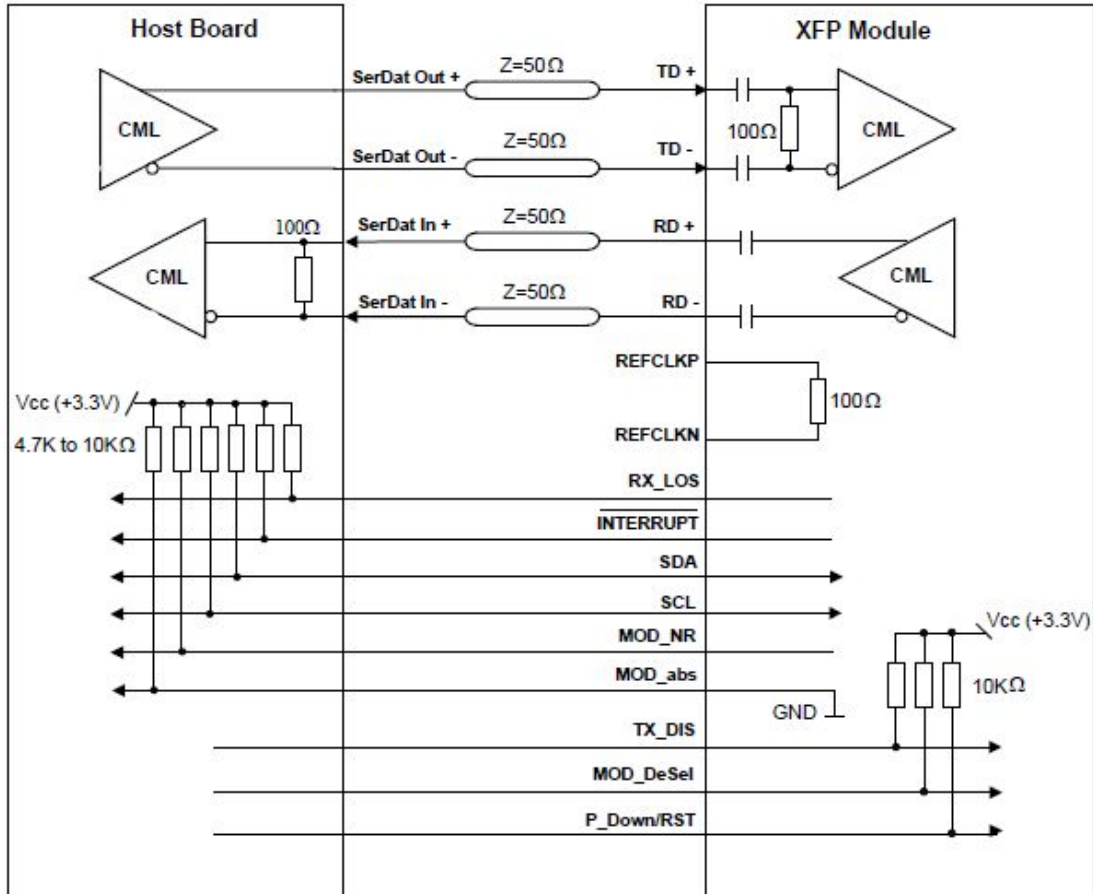


Figure 1, Recommended Interface Circuit

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Recommended Host Board Power Supply Circuit

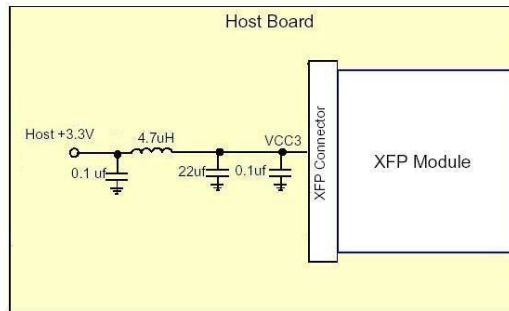


Figure 2, Recommended Host Board Power Supply Circuit

Pin arrangement

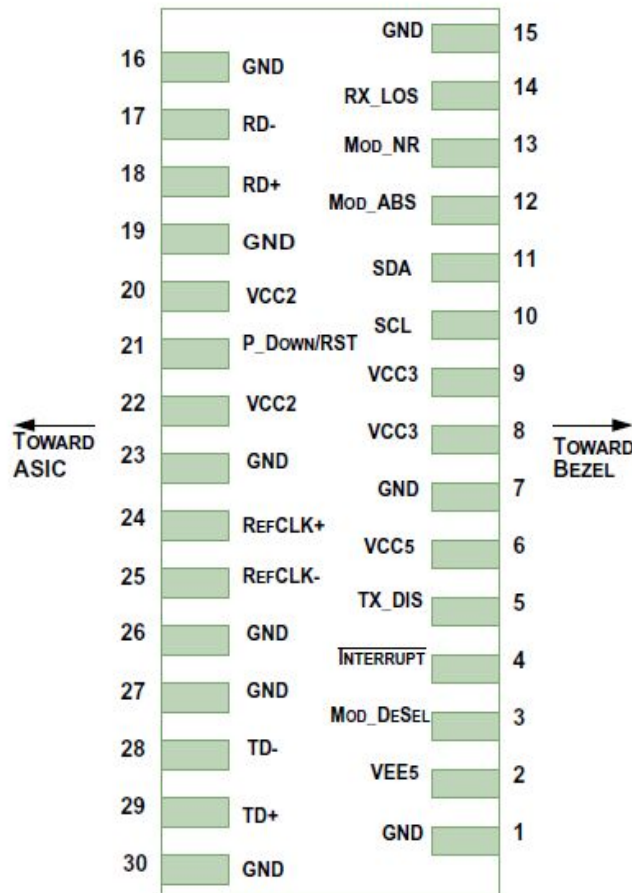


Figure 3, Pin View

Table 5-Pin Function Definition

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Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground	1
2		VEE5	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		VCC5	+5V Power Supply (Not implemented)	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+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		VCC2	+1.8V Power Supply (Not implemented).	3
21	LVTTL-I	P_Down/RS T	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 the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply (Not implemented)	3
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

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28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

Note:

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

Digital Diagnostic Memory Map

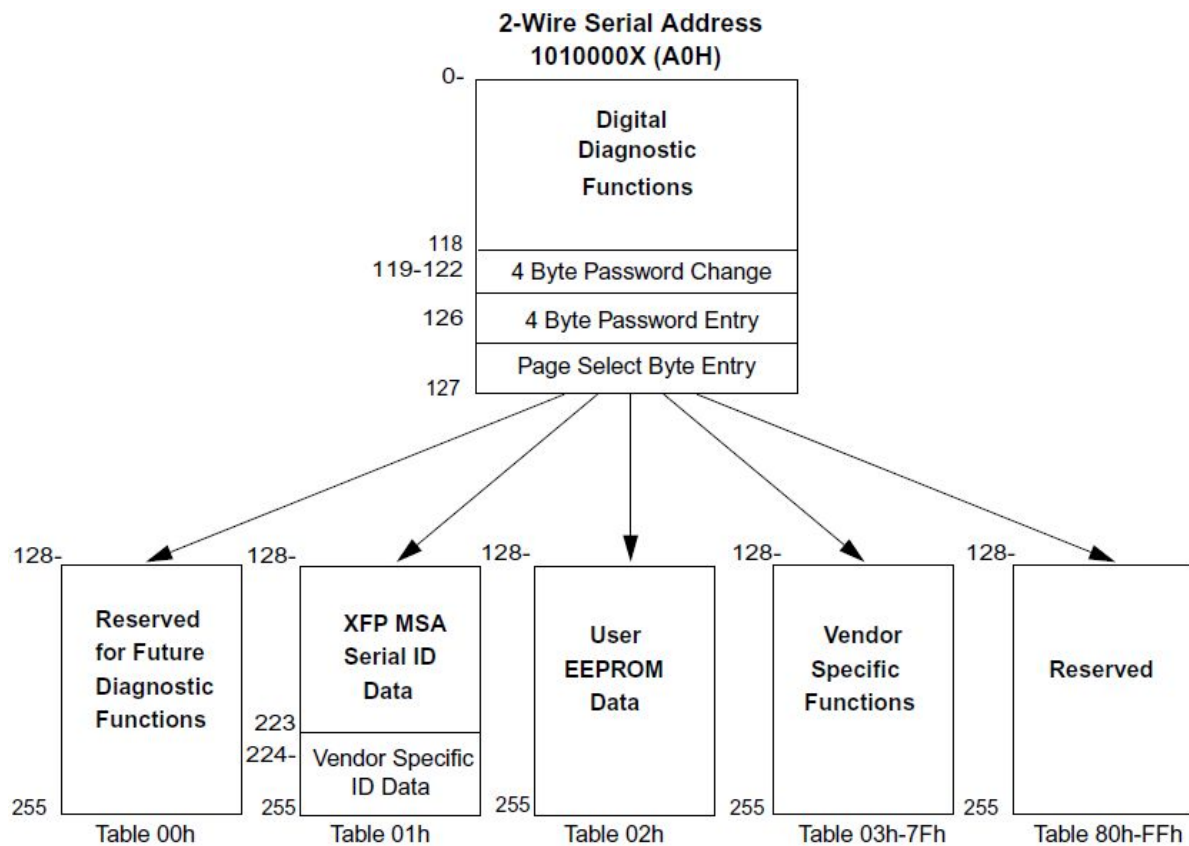


Figure 4, Memory Map

XFP 10G Bi-Di Transceiver

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Mechanical Diagram

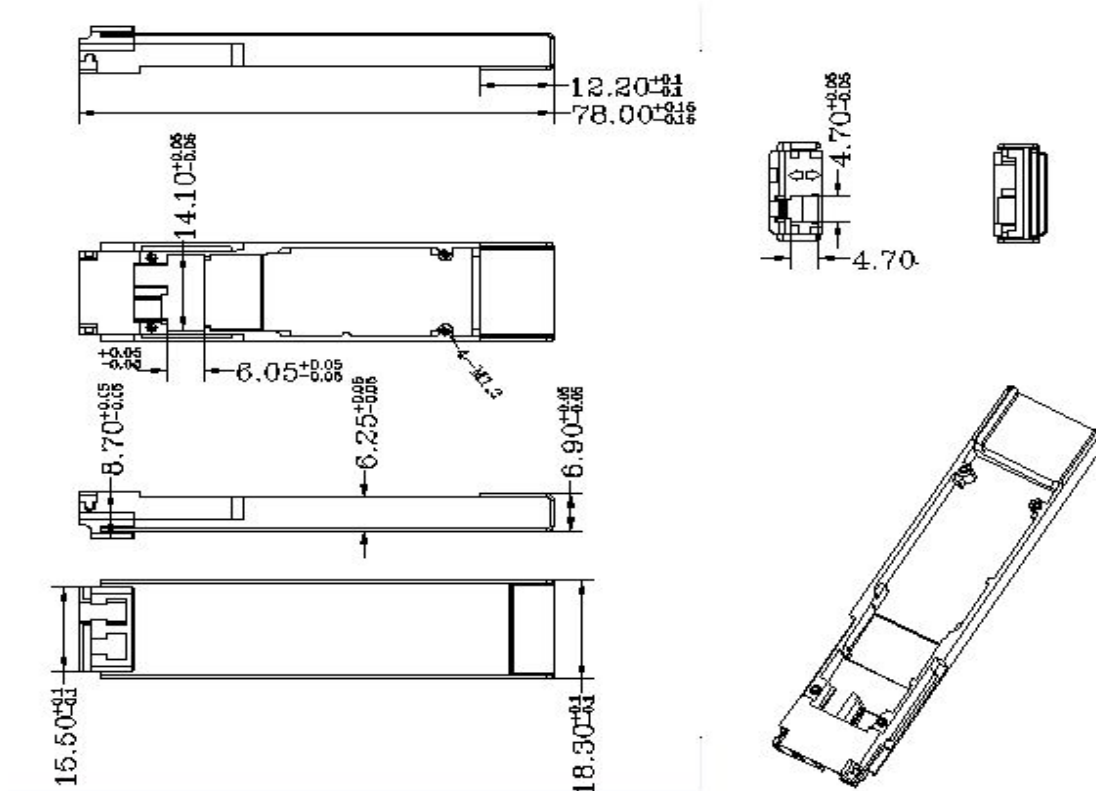


Figure 5, Mechanical Diagram

Order Information

Table 6-Order Information

Part No.	Bit Rate (Gbps)	Laser TX(nm)	Laser RX(nm)	Fiber Type	Distance	Connector
SOXPB-2399-20	10.3125	1270	1330	SMF	10-20KM	Simplex LC Receptacle
SOXPB-3299-20	10.3125	1330	1270	SMF	10-20KM	Simplex LC Receptacle
SOXPB-2399-40	10.3125	1270	1330	SMF	20-40KM	Simplex LC Receptacle
SOXPB-3299-40	10.3125	1330	1270	SMF	20-40KM	Simplex LC Receptacle



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