

10G BIDI XFP 1270nm-TX/1330nm-RX 80km Transceiver

XFP-10G-BX80D-LL



Application

- 10GBASE-ZR/ZW Ethernet
- SONET OC-192/SDH STM-64
- 1200-SM-LL-L 10G Fibre Channel

Standards

- IEEE 802.3ae 10GBASE-ZR
- XFP MSA

Features

- Support 9.95Gb/s to 11.3Gb/s bit rates
- Hot Pluggable XFP footprint
- Single LC for Bi-directional Transmission
- Maximum link length of 80km
- Single 3.3V voltage supply
- Uncooled 1270nm CWDM DFB Laser, APD receiver
- Power dissipation < 3.5W
- No Reference Clock required
- Built-in digital diagnostic functions
- Temperature range 0° C to 70° C
- Very low EMI and excellent ESD protection
- RoHS Compliant

Description

Longline Bi-directional 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. They comply with 10-Gigabit Ethernet 10GBASE-ZR/ZW per IEEE 802.3ae, SONET OC-192 /SDH STM-64 and 10G Fibre Channel 1200-SM-LL-L. Digital diagnostics functions are available via a 2-wire serial interface, as specified in the XFP MSA.

Products Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature Range	T _{ST}	-40	85	°C
Supply Voltage	V _{CC}	-0.5	4.0	V

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Temperature Range	T _C	0		70	°C
Power Supply Voltage	V _{CC}	3.13	3.3	3.45	V
Bit Rate	BR	9.95		11.3	Gb/s
Bit Error Rate	BER			10 ⁻¹²	
Max. Supported Link Length	L			80	km

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Data Rate	B	9.95		11.3	Gbps	
Average Optical Power	P _{max}	2		5	dBm	1
Center Wavelength	λ	1260	1270	1280	nm	
Spectral Width	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR _{min}	30			dB	
Average Launch Power of OFF Transmitter	P _{OFF}			-30	dBm	
Extinction Ratio	ER	6			dB	
Rise/Fall Time (20%~80%)	T _r /T _f			50	ps	
Tx Jitter	T _{xj}	Compliant with each standard requirements				
Optical Eye Mask			IEEE802.3ae			2
Receiver						
Data Rate	BR	9.95		11.3	Gbps	
Center Wavelength	λ _C	1320	1330	1340	nm	
Receiver Sensitivity	R _{SEN}			-22	dBm	2
Maximum Input Power	P _{MAX}	-7			dBm	2
Receiver Reflectance	R _{rx}			-27	dB	

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
LOS	Optical Assert	LOS _A	-35			dBm	
	Optical Dessert	LOS _D			-23	dBm	
LOS Hysteresis		LOS _H	0.5		5	dB	

Notes

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

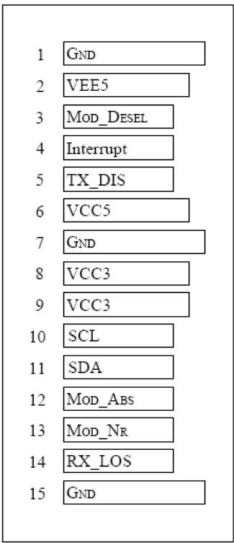
IV. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V _{CC}	3.13		3.45	V	
Supply Current	I _{CC}			500	mA	
Module Total Power	P			3.5	W	
Transmitter						
Input Differential Impedance	R _{IN}		100		Ω	1
Differential Data Input Swing	V _{IN,pp}	150		820	mV	
Transmit Disable Voltage	V _D	2		V _{CC}	V	
Transmit Enable Voltage	V _{EN}	G _{ND}		G _{ND} +0.8	V	
Transmit Disable Assert Time	T _{off}			100	ms	
Tx Enable Assert Time	T _{on}			100	ms	
Receiver						
Differential Data Output Swing	V _{out,pp}	300	500	850	mV	
Output Rise Time	t _{RISE}			35	ps	2
Output Fall Time	t _{FALL}			35	ps	2
LOS Fault	V _{LOSFT}	V _{CC} – 0.5		V _{CCHOST}	V	3
LOS Normal	V _{LOSNR}	G _{ND}		G _{ND} +0.5	V	3
Power Supply Rejection	PSR		See Note 4 below			4

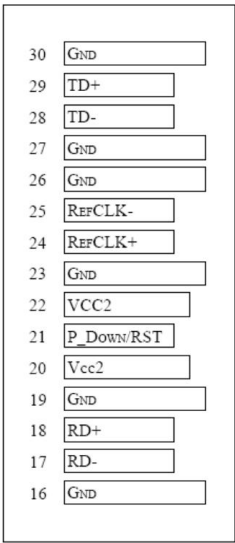
Notes

- 1. After internal AC coupling.
- 2. 20 – 80 %
- 3. Loss of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
- 4. Per Section 2.7.1. in the XFP MSA Specification.

V. Pin Description



Bottom of Board
(As view through top of board)



Top of Board

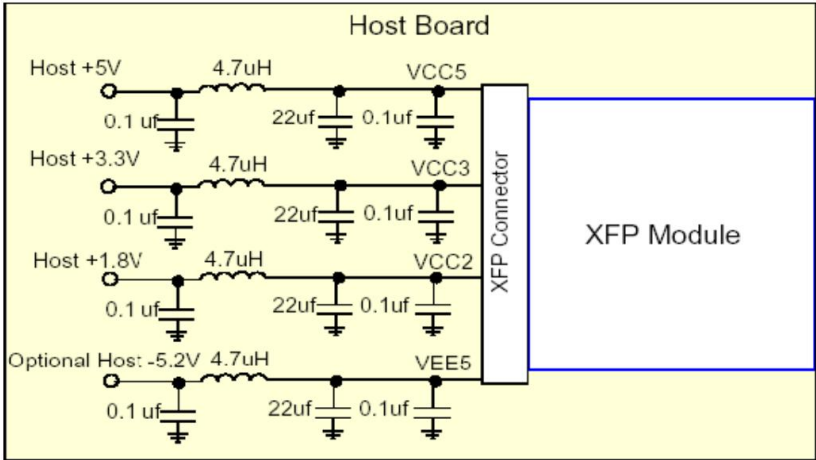
Pin Number	Logic	Symbol	Name/Description	Notes
1		G _{ND}	Module Ground	1
2		V _{EE5}	Optional –5.2 Power Supply – Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		V _{CC5}	+5 Power Supply	
7		G _{ND}	Module Ground	1
8		V _{CC3}	+3.3V Power Supply	
9		V _{CC3}	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL-I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module	2
13	LVTTL-O	Mod_NR	Module Not Ready	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator	2
15		G _{ND}	Module Ground	1

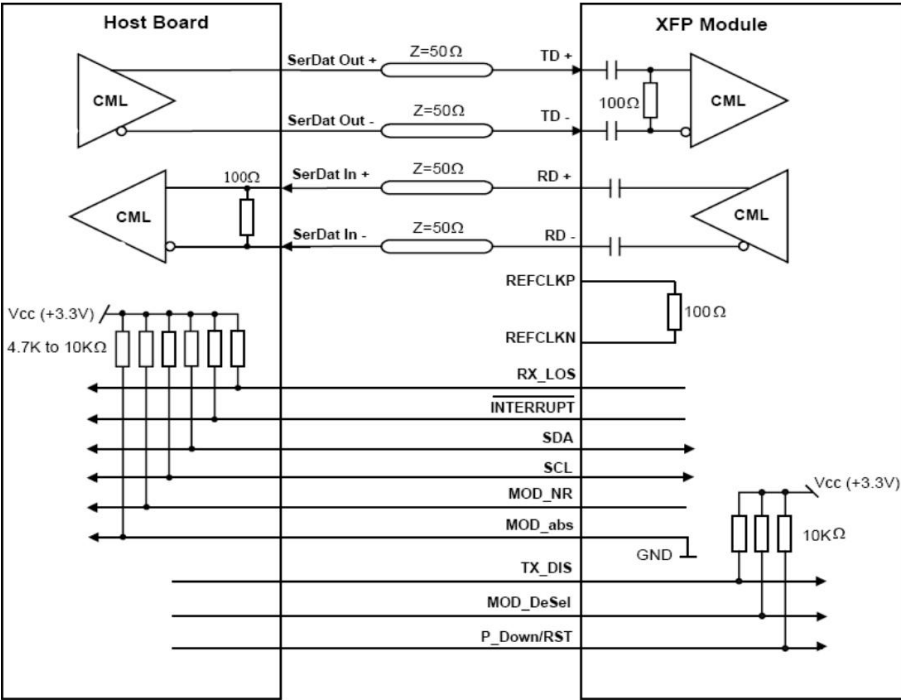
Pin Number	Logic	Symbol	Name/Description	Notes
16		G _{ND}	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		G _{ND}	Module Ground	1
20		V _{CC2}	+1.8V Power Supply – Not required	
21	LVTTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle	
22		V _{CC2}	+1.8V Power Supply – Not required	
23		G _{ND}	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board –Not required	3
26		G _{ND}	Module Ground	1
27		G _{ND}	Module Ground	1
28	CML-I	TD-	Transmitter inverted data input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		G _{ND}	Module Ground	1

Notes

- 1. Module circuit ground is isolated from module chassis ground within the module.
- 2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.45V.
- 3. A Reference Clock input is not required.

VI. Typical Application Circuit





VII. Diagram Mechanical Drawing

