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

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 10km
- Single 3.3V voltage supply
- Uncooled 1330nm CWDM DFB Laser
- Power dissipation ＜1.5W
- 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

Applications

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

Compliance

- IEEE 802.3ae 10GBASE-LR
- XFP MSA

Description

The XFP-10G-D10-32 transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. They comply with 10-Gigabit Ethernet 10GBASE-LR/LW 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.

Absolute Maximum Ratings

Table1-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

Recommended Operating Environment

Table2-Recommended Operating Environment

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			10	km

Optical Characteristics

Table3-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Data Rate	B	9.95		11.3	Gbps	
Maximum Launch Power	P_{max}	-5		0	dBm	1
Center Wavelength	λ	1320	1330	1340	nm	
Spectral Width	Δ λ			1	nm	
Side Mode Suppression Ratio	$SMSR_{min}$	30			dB	
Average Launch Power of OFF Transmitter	P_{OFF}			-30	dBm	
Extinction Ratio	ER	3.5			dB	
Rise/Fall Time (20%~80%)	T_r/T_f			50	ps	
Tx Jitter	Txj	Compliant with each standard requirements				
Optical Eye Mask		IEEE802.3ae				2

Receiver							
Data Rate		BR	9.95		11.3	Gbps	
Center Wavelength		λ_C	1260	1270	1280	nm	
Receiver Sensitivity		R_{SEN}			-14	dBm	2
Maximum Input Power		P_{MAX}	0			dBm	2
Receiver Reflectance		Rrx			-27	dB	
LOS	Optical Assert	LOS_A	-30			dBm	
	Optical Dessert	LOS_D			-15	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.

Electrical Characteristics

Table4-Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	VCC	3.13		3.45	V	
Supply Current	ICC			500	mA	
Module Total Power	P			2.5	W	
Transmitter						
Input Differential Impedance	RIN		100		Ω	1
Differential Data Input Swing	VIN,pp	150		820	mV	
Transmit Disable Voltage	VD	2		VCC	V	
Transmit Enable Voltage	VEN	GND		GND+0.8	V	
Transmit Disable Assert Time	T_off			100	ms	
Tx Enable Assert Time	T_on			100	ms	
Receiver						
Differential Data Output Swing	Vout,pp	300	500	850	mV	
Output Rise Time	tRISE			35	ps	2
Output Fall Time	tFALL			35	ps	2
LOS Fault	VLOSFT	VCC – 0.5		VCCHOST	V	3
LOS Normal	VLOSNR	GND		GND+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.

Pin Function Definitions

Table5-Pin Function Definitions

Pin Number	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground	1
2		VEE5	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		VCC5	+5 Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+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		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 required	
21	LVTTL-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		VCC2	+1.8V Power Supply – Not required	
23		GND	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		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

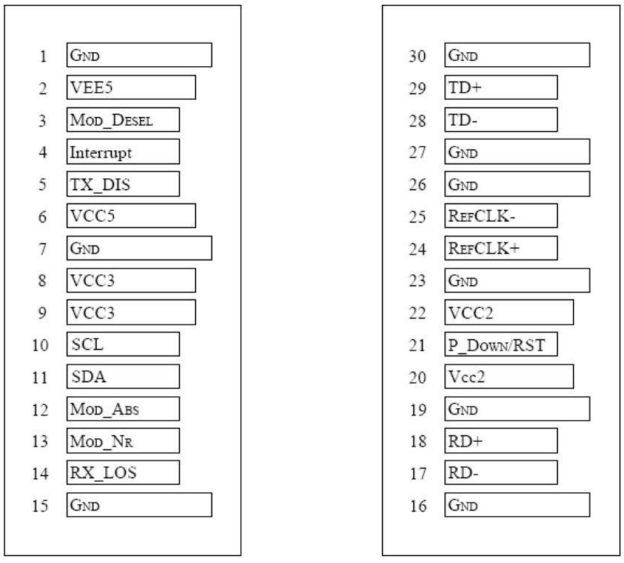
Notes:

[1] Module 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.

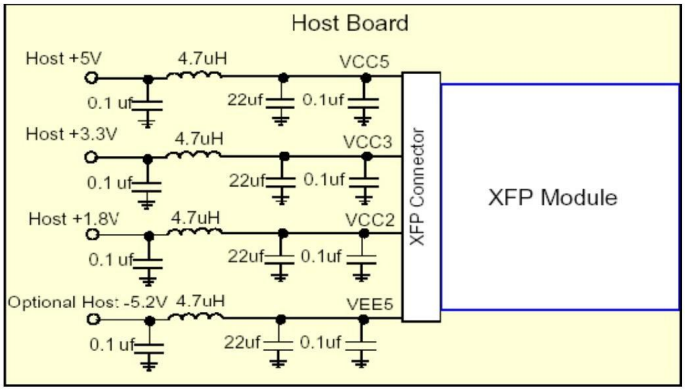
Pin Description



Bottom of Board
(As view through top of board)

Top of Board

Typical Application Circuit



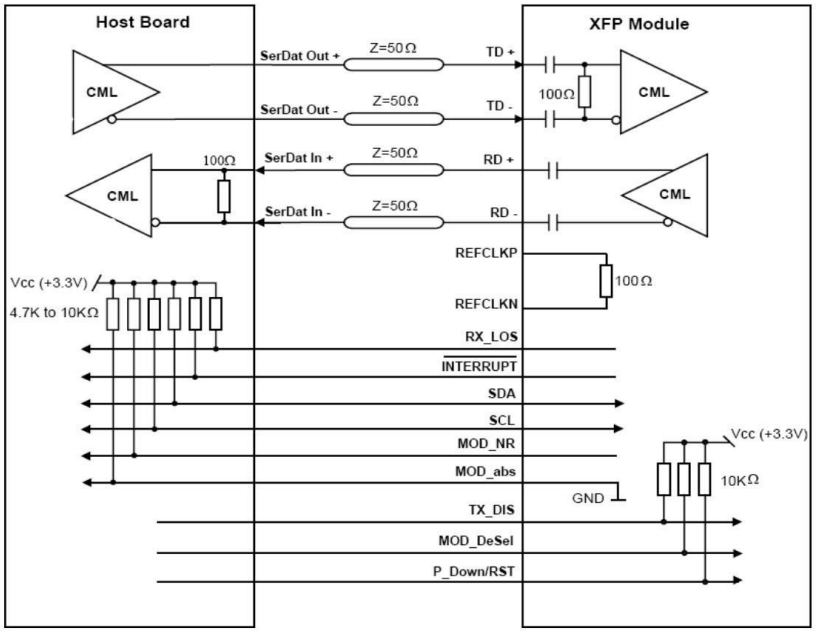
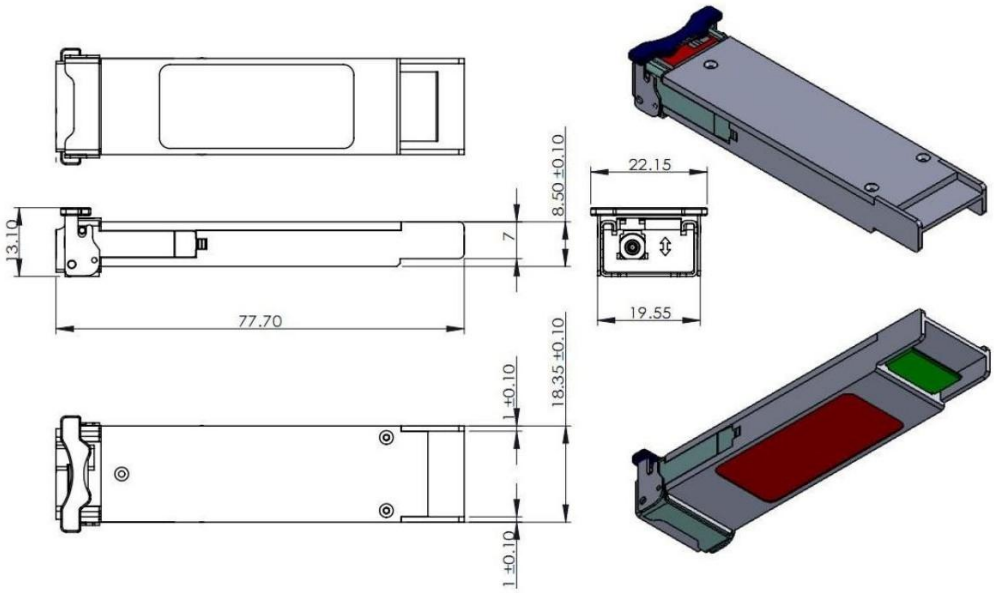


Diagram Mechanical Drawing



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