

Product Specification

XFP WDM LR 20km Transceiver



1. Features

- Up to 10.7Gbps Data Links
- Single Mode LC Receptacle Bi-directional Transceiver
- Up to 20km transmission on SMF
- Power dissipation <1.5W
- 1270nm DFB laser and 1330nm PIN receiver
- 2-wire interface with integrated Digital Diagnostic monitoring
- EEPROM with Serial ID Functionality
- Compliant with FC PI 4 REV 7.0
- Compliant with XFP MSA with duplex LC connector
- Single + 3.3 V Power Supply and LVTTTL Logic
- Operating case temperature: 0°C ~ +70°C

2. Applications

- 10GBASE-BX 10.3125Gb/s Ethernet
- 10GBASE-BX 9.953Gb/s Ethernet

3. Product Selection

- **XFP WDM LR 20km**

4. Product Description

XFP WDM LR 20km is hot pluggable 3.3 V Small-Form-Factor transceiver module. It designed expressly for high-speed communication applications that require rates up to 10.7Gb/s, it designed to be compliant with XFP MSA. The module data link up to 20KM in 9/125um single mode fiber.

The optical output can be disabled by a LVTTTL logic high-level input of Tx Disable. Tx Fault is provided to indicate that degradation of the laser. Loss of signal (LOS) output is provided to indicate the loss of an input optical signal of receiver or the link status with partner.

5. Absolute Maximum Ratings

Rating	Symbol	Min.	Typical	Max.	Units
Storage Temperature	T _s	-40		85	°C
Storage Ambient Humidity	HA	5	-	95	%
Operating Relative Humidity	RH	-	-	85	%
Power Supply Voltage	V _{CC}	-0.3	-	4	V
Signal Input Voltage		V _{CC} -0.3	-	V _{CC} +0.3	V

6. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Units
Ambient Operating Temperature	T _A	0		70	°C ^[1]
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V
Power Supply Current	I _{CC}	-	-	450	mA
Data Rate	BR		10.3125		Gbps
Transmission Distance	TD	2	-	20	Km ^[2]
Coupled fiber					Single mode fiber ^[3]

Notes:

- [1] Without air flow
- [2] Measured with SMF
- [3] ITU-T G.652

7. Specification of Transmitter

Parameter	Symbol	Min.	Typical	Max.	Units
Average Launched Power	PO	-6	-	-1	dBm
Average Launched Power(Laser Off)	POUT-OFF	-	-	-30	dBm ^[1]
Optical Modulation Amplitude	OMA	-3	-	-	dBm ^[1]
Center Wavelength Range	λ _C	1260	1270	1280	nm
Side mode suppression ratio	SMSR	30	-	-	dB
Spectrum Bandwidth(-20dB)	σ	-	-	1	nm
Extinction Ratio	ER	3.5	6	-	dB ^[2]
Output Eye Mask					Compliant with FC_PI_4 REV 7.0 ^[2]

Notes:

- [1] The optical power is launched into SMF
- [2] Measured with RPBS 2^{^31}-1 test pattern @10.3125Gbs

8. Specification of Receiver

Parameter	Symbol	Min.	Typical	Max.	Units
Input Optical Wavelength	λ_{IN}	1320	1330	1340	nm
Receiver Sensitivity in average	PIN	-	-	-15	dBm ^[1]
Input Saturation Power (Overload)	PSAT	0.5	-	-	dBm ^[1]
LOS -Assert Power	PA	-30	-	-	dBm
LOS -Deassert Power	PD	-	-	-15	dBm
LOS -Hysteresis	PHys	0.5	-	4	dB

Notes:

[1] Measured with RPBS 2^{^31}-1 test pattern @ 10.3125Gbs BER $\leq 10^{-12}$ ER=6DB

9. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Total power supply current	I _{cc}			350	mA
TRANSMITTER					
Differential Data Input Voltage	VDT	120	-	820	mVp-p
Differential line input Impedance	RIN	85	100	115	Ohm
Transmitter Fault Output-High	VFaultH	2.4	-	V _{CC}	V
Transmitter Fault Output-Low	VFaultL	-0.3	-	0.8	V
Transmitter Disable Voltage- High	VDisH	2	-	V _{CC} +0.3	V
Transmitter Disable Voltage- low	VDisL	-0.3	-	0.8	V
RECEIVER					
Differential Data Output Voltage	VDR	300	-	850	mVp-p
Differential line Output Impedance	ROUT	80	100	120	Ohm
Receiver LOS Pull up Resistor	RLOS	4.7	-	10	KOhm
Data Output Rise/Fall time	tr/tf	20	-	-	ps
LOS Output Voltage-High	VLOSH	2	-	V _{CC}	V
LOS Output Voltage-Low	VLOSL	-0.3	-	0.4	V

10. Pin Description

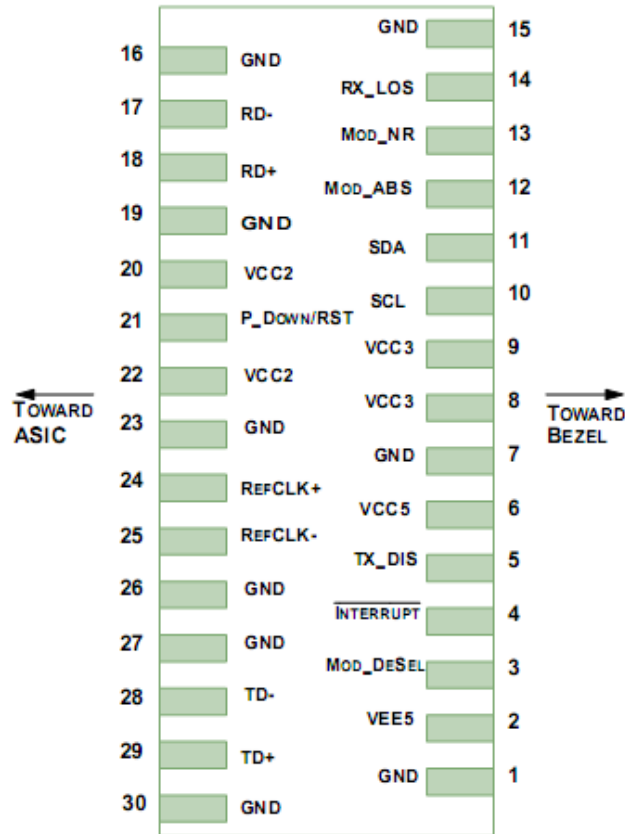


Figure 1. Electrical Pin-out Details

Pin	Logic	Symbol	Name/Description
1		GND	Module Ground [1]
2		VEE5	Optional -5.2 Power Supply - Not required
3	LVTTTL-I	Mod-Desel	Module De-select; When held low allows the module to , respond to 2-wire serial interface commands
4	LVTTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface [2]
5	LVTTTL-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	LVTTTL-I	SCL	Serial 2-wire interface clock [2]
11	LVTTTL-I/O	SDA	Serial 2-wire interface data line [2]

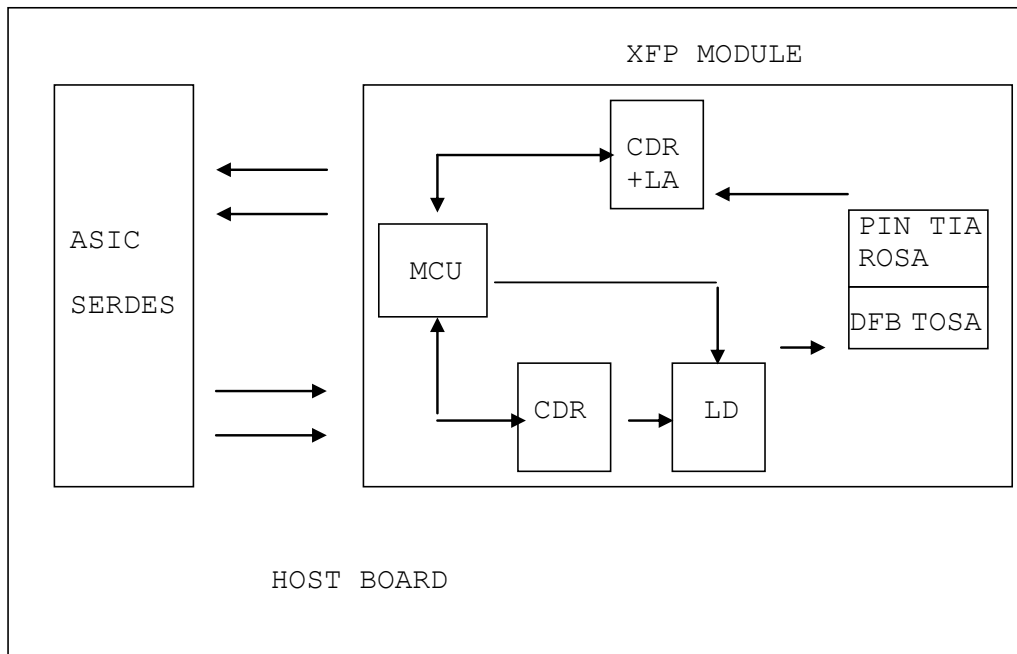
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Pin	Logic	Symbol	Name/Description
12	LVTTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module ^[2]
13	LVTTTL-O	Mod_NR	Module Not Ready ^[2]
14	LVTTTL-O	RX_LOS	Receiver Loss of Signal indicator ^[2]
15		GND	Module Ground ^[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	LVTTTL-I	P_Down/R ST	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
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 4.7 - 10 kΩ on host board to a voltage between 3.15V and 3.6V.
- [3] A Reference Clock input is not required by the XFP 10G WDM LR20 TX1270. If present, it will be ignored

11. Recommended Interface Circuit



12. Outline Dimensions

