



XFP-ZR Transceiver, 80km Reach

Features

- ≡ XFP MSA Compliant
- ✦ data rate from 9.95 Gbps to 11.1Gbps
- ✦ No Reference Clock required
- ≡ Cold Start up Wavelength Compliance
- ✦ EML transmitter and APD receiver
- ✦ link length up to 80km
- ≡ Low Power Dissipation 3.5W Maximum
- ✦ -5°C to 70°C Operating Case Temperature
- ✦ Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- ✦ RoHS compliant and lead free
- ✦ LC interface



Applications

- ✦ SONET(OC-192)/SDH(STM64)
- ✦ 10GE Ethernet switches and routers
- ✦ 10GE Core-routers
- ✦ 10GE Storage
- ✦ Inter Rack Connection
- ✦ Other high speed data connections

Description

3c-Link XFP Transceiver is designed for 10G SDH, 10G ZR and 10G Fiber- Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a colded EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. 3c-Link XFP transceiver provides an enhanced monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage 1	Vcc3	-0.5	4.0	V
Supply Voltage 2	Vcc5	-0.5	6.0	V
Supply Voltage 3	Vcc2		2	
Storage Temperature	Tst	-40	85	°C
Case Operating Temperature	Top	-5	70	°C
Optical Input Received Power	APD-IN	-	-8	dBm

Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3.47	V
Supply current 1	Icc3			750	mA
Supply Voltage 2	Vcc5	4.75	5	5.25	V
Supply current 2	Icc5			500	mA
Supply Voltage 3	Vcc2	1.71	1.8	1.89	V
Supply current 3	Icc2			750	mA
Operating Case temperature	Tca	-5	-	70	°C
Module Power Dissipation	Pm	-		3.5	W

Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate Multirate	Mra	9.95	-	11.1	Gbps
Center Wavelength	λ_c		1550		nm
Optical Transmit Power	Po	0	-	+4	dBm
Optical Transmit Power (disabled)	PTX_DISABLE	-	-	-30	dBm
Extinction Ratio	ER	8.2		-	dB
Channel Spacing	Δf	-	100	-	GHz
Jitter Generation	TJP-P	-	-	0.1	UI
Spectral Width (-20dB)	DI20	-	0.1	0.3	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Dispersion penalty(800ps/nm)	DP			2	dB
Eye Mask	Compliant with ITU-T G.691 STM-64 eye mask				

Transmitter Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	Rim	-	100	-	Ω
Differential data Input	VtxDIFF	120	-	850	mV
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V
Transmit Enable Voltage	Ven	0	-	+0.8	V
Transmit Disable Assert Time	Vn	-	-	10	us

Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate Multirate	Mra	9.95	-	11.1	Gbps
Receiver Sensitivity 9.95Gb/s	Rsens9	-	-	-24	dBm
Receiver Sensitivity 10.7Gb/s	Rsens10	-	-	-23	dBm
Maximum Input Power	RX-overload	-	-	-7	dBm
Input Operating Wavelength	λ	1528	-	1564	nm
Reflectance	Rrx	-	-	-27	dB
Loss of Signal Asserted		-34	-	-	dBm
LOS De-Asserted		-	-	-24	dBm
LOS Hysteresis		0.5	-	-	dB

Receiver Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time	Tr / Tf	24	-	-	ps
Loss of Signal –Asserted	VOH	2	-	Vcc3+0.3-	V
Loss of Signal –Negated	VOL	0	-	+0.4	V

Low Speed Electrical Signal Timings

Parameter	Symbol	Min	Typical	Max	Unit
TX Disable, Power_Down/RST	VIH	2.0		Vcc3+0.3	V
	VIL	-0.3		0.8	V
Interrupt, Mod_NR, Rx_Los	VOH	Vdd3-0.5		Vdd3+0.3	V
	VOL	0		0.4	V
SCL,SDA(IN)	VIH	Vdd3*0.7		Vdd3+0.5	V
	VIL	-0.3		Vdd3*0.3	V
SCL,SDA(OUT)	VOH	Vdd3-0.5		Vdd3+0.3	V
	VOL	0		0.4	V
I2C clock rate	t_reset		-	400	KHz
Leakage current	IL	-	-	100	uA

Pin Descriptions

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V 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	
4	LVTTL-O	INTb	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
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	RDN	Receiver Inverted Data Output	
18	CML-O	RDP	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply (Not required).	3
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 the 2-wire serial interface, equivalent to a power cycle.	
22		V _{CC2}	+1.8V Power Supply (Not required)	3
23		GND	Module Ground	1
24	PECL-I	REFCLKP	Not used, internally terminated to 50ohm (100ohm diff).	4
25	PECL-I	REFCLKN	Not used, internally terminated to 50ohm (100ohm diff).	4
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TDN	Transmitter Inverted Data Input	
29	CML-I	TDP	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

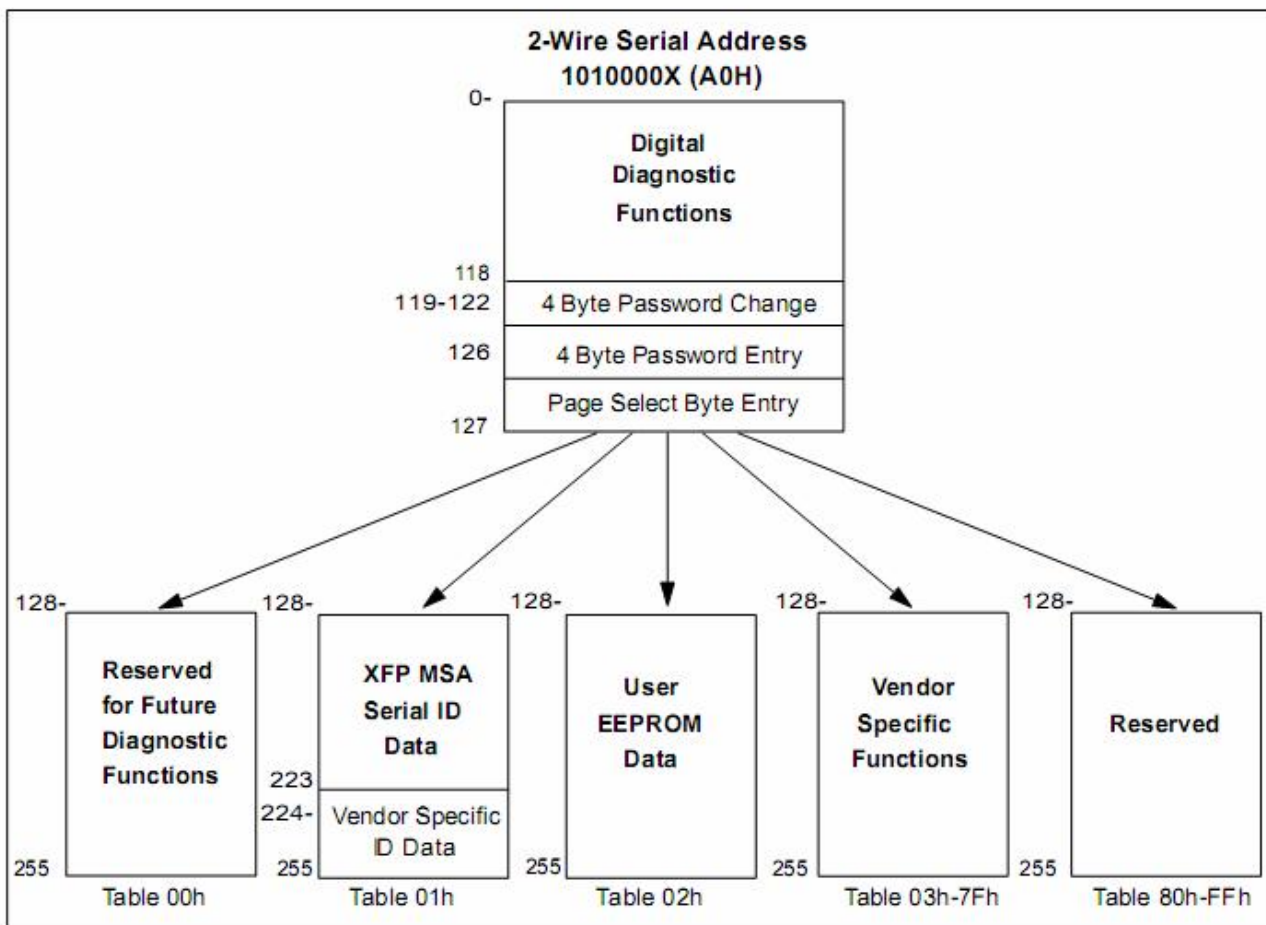
1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Open collector; Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.6V on the host board.
3. The pins are open within module.
4. Reference Clock is not required.

Management Interface

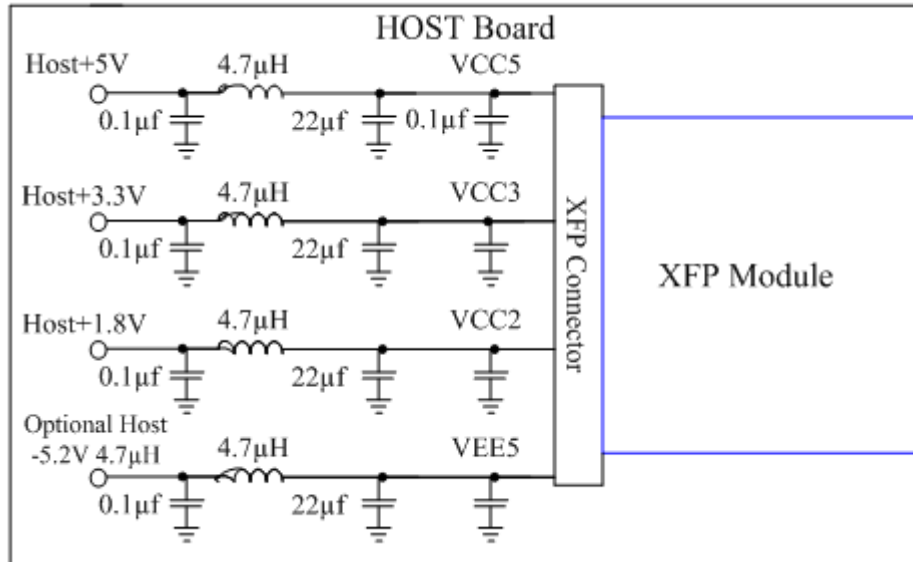
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Alarm/warning threshold data is written during device manufacture. Transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented.

The digital diagnostic memory map specific data field defines as following.



Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

