

XFP-S1015L-120

Optical XFP Module

10Gbps XFP Transceiver SM 1550nm 120km LC



Features

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- 1550nm Cooled EML laser and APD photodiode
- Maximum link length of 120km with SMF
- XFP MSA package with duplex LC connector
- Hot-pluggable XFP footprint, Built-in digital diagnose
- No reference clock required
- Single +3.3V power supply
- Power dissipation <3.5W
- Compatible with RoHS
- Operating case temperature:
Standard: -5 to +70°C

Application

- 10GBASE-ZR/ZW 10G Ethernet
- 10G Fiber Channel
- SONET OC-192 & SDH STM 64

Standard

- Compliant with XFP MSA
- Compliant with SFF-8472
- Compliant with IEEE 802.3ae

Description

The XFP module is compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA), supporting data-rate of 9.95~11.3Gbps, and transmission distance up to 120km on SMF.

The transceiver module comprises a transmitter with 1550nm Cooled EML laser and a receiver with a APD photodiode. Transmitter and receiver are separate within a wide temperature range and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10 GbE systems.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	Vcc3	-0.3	+3.6	V
Power Supply Voltage	Vcc2	-0.3	+2.0	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature (Commercial)	Tc	0		+70	°C
Power Supply Voltage	Vcc	3.13	3.30	3.47	V
Power Supply Current	Icc			760	mA
Data Rate			10.3	11.3	Gbps
Transmission Distance		-	120	-	km

Optical and Electrical Characteristics

Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter differential input voltage		120		820	mV	
Receiver differential output Voltage		340	650	850	mV	
Input differential impedance	R		100		Ω	
Transmit Disable Assert Time			10		us	
Data output rise time	tr			38	ps	
Data output fall time	tf			38	ps	
Transmit Fault (TX_Fault)	Voh	2		Vcc	V	LVTTTL
	Vol	0		0.8	V	LVTTTL
Loss of Signal (LOS)	Voh	Vcc-0.5		Vcc	V	LVTTTL
	Vol	0		0.5	V	LVTTTL
TX Disable	Vih	2		Vcc	V	LVTTTL
	Vil	0		0.8	V	LVTTTL

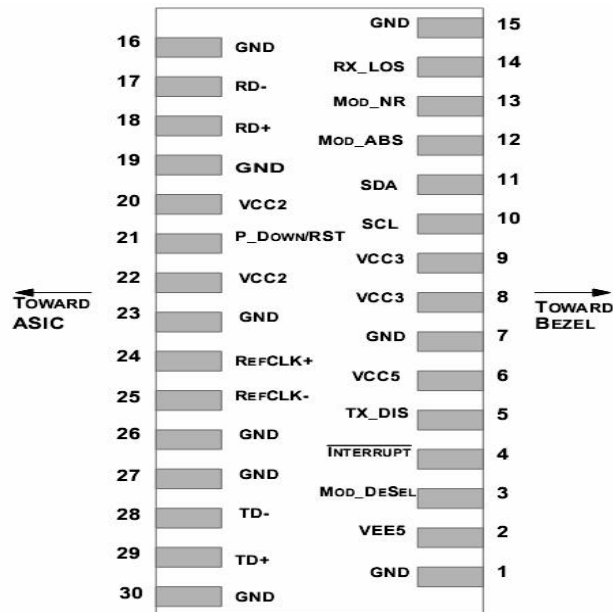
Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.)	Pout	0		5	dBm	
Operating Wavelength Range	λ_c	1530	1550	1570	nm	
Extinction Ratio	ER	9			dB	2
Relative Intensity Noise	RIN			-130	dB/Hz	
Average Launch power of transmitter	P _{OFF}			-30	dBm	
Side mode Suppression ratio	SMSR		30		PS	3
Eye Mask Margin		30			%	
Output Eye Diagram	Complies with IEEE802.3z eye masks when filtered					
Optical Receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity	S			-24	dBm	4
Wavelength Range	λ_c	1270		1610	nm	
Optical Power Input Overload	P _{in-max}	-6			dBm	4
Receiver Reflectance	R			-27	dB	

LOS	Optical De-assert	Pd			-27	dBm	4
	Optical Assert	Pa	-37				
LOS hysteresis			0.5			dB	5

Notes:

- 1) The supply current is XFP module's working current.
- 2) For the measurements, the device was driven with 10Gbps data pattern with $2^{31}-1$ PRBS payload.
- 3) Optical transition time is the time interval required for the rising or falling edge of an optical pulse to transition between the 20% and 80% amplitudes relative to the logical 1 and 0 levels
- 4) Measured with a PRBS $2^{31}-1$ test pattern, @10Gbps, ER=9dB, BER< 10^{-12}
- 5) The LOS Hysteresis minimizes 'chatter' on the output line. In principle, Hysteresis alone does not guarantee chatter-free operation.

Pin Description



Pin	Logic	Symbol	Name/Description	Re
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 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	+5V Power Supply – Not required	
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	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	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:

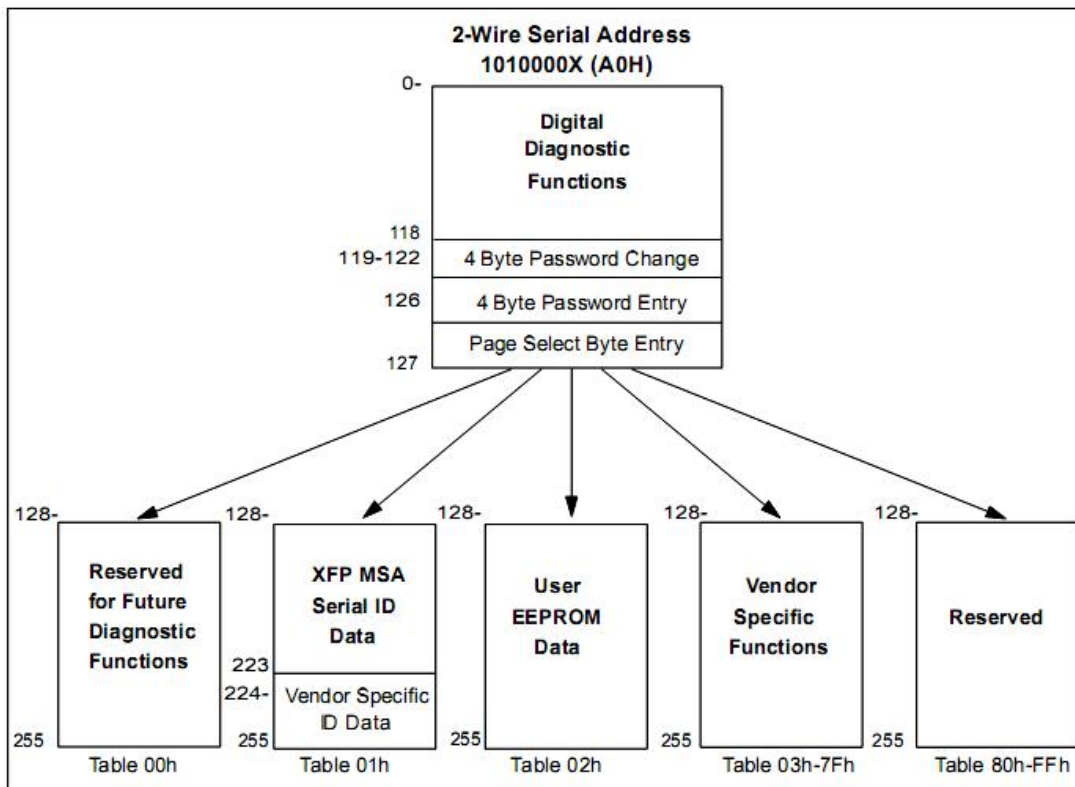
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector, should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required.

Management Interface

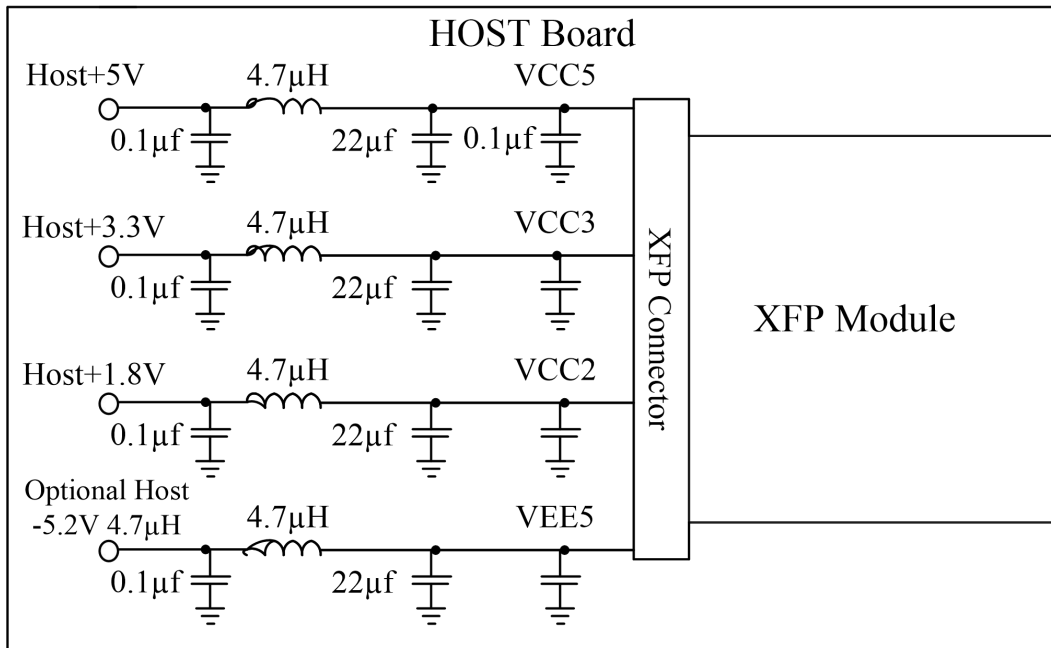
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

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. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented.

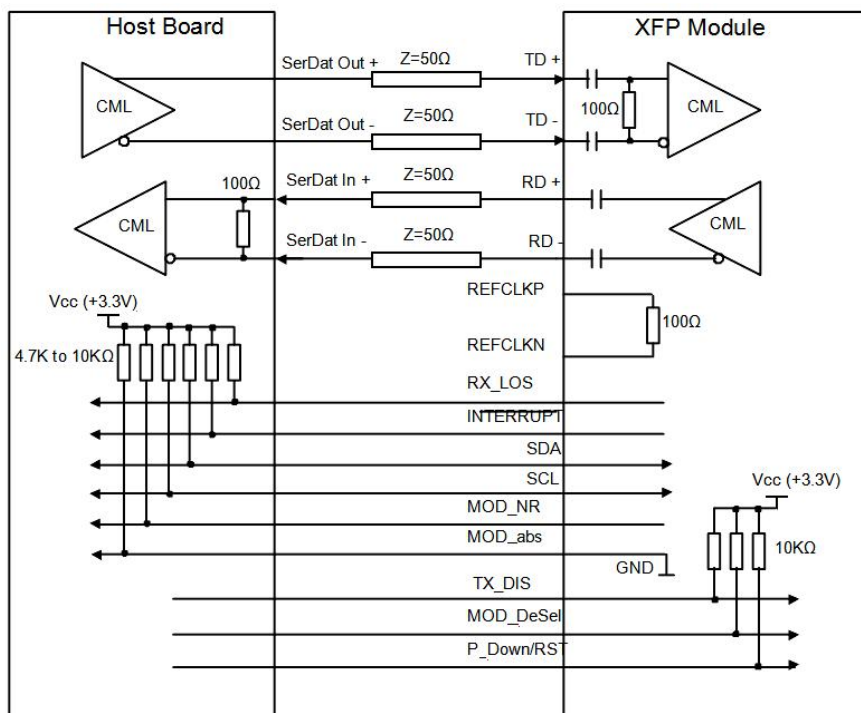
The digital diagnostic memory map specific data field defines as following.



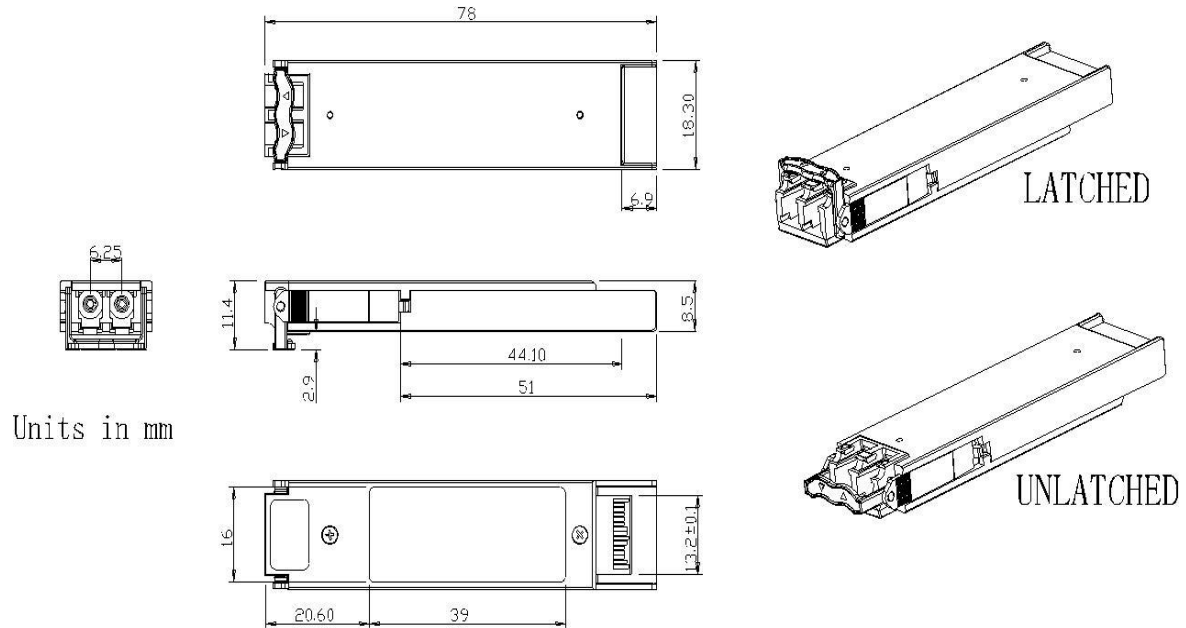
Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit



Mechanical Dimensions



Ordering information

Model No.	Product Description
XFP-S1015L-120	10Gbps, 1550nm, SMF, 120km, 0°C ~ +70°C, with DDM



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