JD1310-XFP-LC.S10

1310nm XFP single-Mode for 10GbE/10GFC/SDH/SONET
Duplex XFP Transceiver
RoHS6 Compliant

Features

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- Hot-pluggable XFP footprint
- Link length up to 10km
- Uncooled 1310nm DFB laser
- Duplex LC connector
- Power dissipation <2.5W
- Built-in digital diagnostic functions
- Case Operating Temperature:
  Standard: 0°C to 70°C
- Complaint with XFP MSA
- Complaint with IEEE 802.3ae
  10GBASE-LR/LW
- Complaint with 10GFC 1200-SM-LL-L

Applications

- SONET OC-192 SR-1，SDH STM I-64.1
  at 9.953Gbps
- 10GBASE-LR/LW 10G Ethernet
- 1200-SM-LL-L 10G Fiber Channel
- 10GE over G.709 at 11.09Gbps
- OC192 over FEC at 10.709Gbps

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp.
JD1310-XFP-LC.S10	11.3Gbps	DFB	SMF	10km	LC	Standard

Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compatible with standards Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins are dependent on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compatible with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/receiver performance is detectable between these limits.
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1	CDRH compliant and Class I laser product. TüV Certificate No. 50135086
Component Recognition	UL and CUL EN60950-1:2006	UL file E317337 TüV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards*note2

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for our transceivers, because our transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc3	-0.5		4.0	V	
Storage Temperature	T_S	-40		85	°C	
Case Operating Temperature	T_C	0		70	°C	

Recommend operating condition

Parameter	Symbol	Min	Typ	Max	Units
Supply Voltage	Vcc3	3.13		3.45	V
Case Operating Temperature		0		70	°C

Electrical Characteristics

(T_C = -40 to 85°C)

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	Vcc3	3.13		3.45	V
Supply Current	Icc3			720	mA
Transmitter					
Module total power	P			2.5	W
Input differential impedance	Rin		100		Ω
Differential data input swing*2	Vin,pp	120		820	mV
Transmit Disable Voltage	V_D	2.0		Vcc	V
Transmit Enable Voltage	V_{EN}	GND		GND+ 0.8	V
Transmit Disable Assert Time				10	us
Tx Rise time (20 – 80%)	tr		40		ps
Tx Fall time (20 – 80%)	tf		50		ps
Receiver					
Differential data output swing*2	Vout,pp	340	650	850	mV
Rx Rise time (20 – 80%)	tr			38	ps
Rx Fall time (20 – 80%)	tf			38	ps
LOS Fault*3	$V_{LOS\ fault}$	Vcc – 0.5		VccHOST	V
LOS Normal*3	$V_{LOS\ norm}$	GND		GND+0.5	V

Note2. After internal AC coupling.

Note3. 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.

Optical Characteristics

(T_C = -40 to 85℃, V_{CC} = 3.3 Volts)

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Optical output Power	P_O	-6		0	dBm

Optical Wavelength	λ_C	1290		1330	nm
Optical Extinction Ratio	ER	6			dB
Side Mode Suppression ratio	SSRmin	30			dB
Average Launch power of OFF transmitter	P_{OFF}	-30			dBm
Tx Jitter	Txj	Compliant with each standard requirements			
Receiver					
Receiver Sensitivity @ 10.7Gb/s	Pmin			-14.5	dBm
Maximum Input Power	Pmax	+0.5			dBm
Optical Center Wavelength	λ_C	1270		1600	nm
Receiver Reflectance	Rrx			-14	dB
LOS De-Assert	LOSD			-16.5	dBm
LOS Assert	LOSA	-28.5			dBm
LOS Hysteresis		1			dB

Pin Descriptions

Pin	Symbol	Name/Description	Note
1	GND	Module Ground	4
2	VEE5	Optional –5.2 Power Supply – Not required	
3	Mod-Desel	Module De-select; When held low allows the module to , respond to 2-wire serial interface commands	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	5
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6	VCC5	+5 Power Supply – Not required	
7	GND	Module Ground	4
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2-wire interface clock line	5
11	SDA	Serial 2-wire interface data line	5
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	5
13	Mod_NR	Module Not Ready;	5
14	RX_LOS	Receiver Loss of Signal indicator	5
15	GND	Module Ground	4
16	GND	Module Ground	4
17	RD-	Receiver inverted data output	
18	RD+	Receiver non-inverted data output	
19	GND	Module Ground	4
20	VCC2	+1.8V Power Supply – Not required	

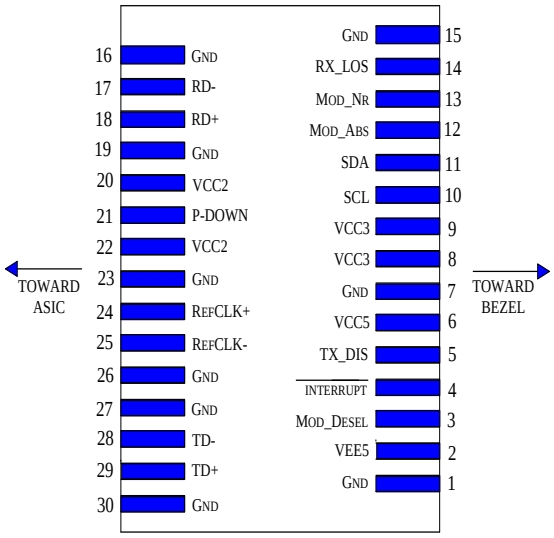
21	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
		Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22	VCC2	+1.8V Power Supply – Not required	
23	GND	Module Ground	4
24	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	6
25	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	6
26	GND	Module Ground	4
27	GND	Module Ground	4
28	TD-	Transmitter inverted data input	
29	TD+	Transmitter non-inverted data input	
30	GND	Module Ground	4

Note4. Module circuit ground is isolated from module chassis ground within the module.

Note5. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

Note6. A Reference Clock input is not required.

Pin arrangement



Pin Numbers and Name

General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Bit Rate	BR	9.95		11.3	Gb/s	1
Bit Error Ratio	BER			10^{-12}		2
Max. Supported Link Length	LMAX		10		km	1

Notes:

1. SONET OC-192 SR-1，SDH STM I-64.1 ,10GBASE-LR/LW, 1200-SM-LL-L

2. Tested with a 2^{31} – 1 PRBS

Digital Diagnostic Functions

JD1310-XFP-LC.S10 Small Form Factor 10Gbps (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5.

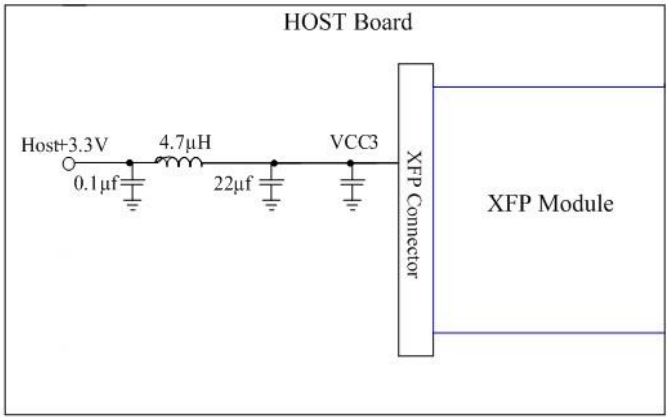
As defined by the XFP MSA, our XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

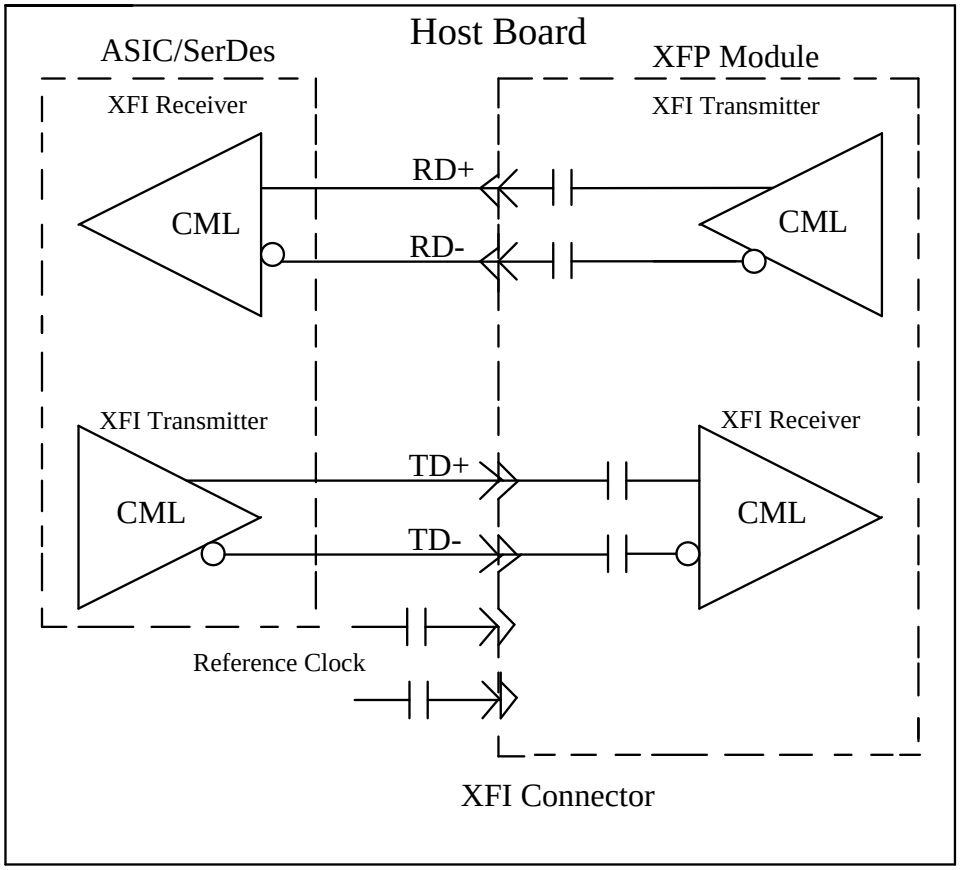
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

Recommended Host Board Power Supply Circuit

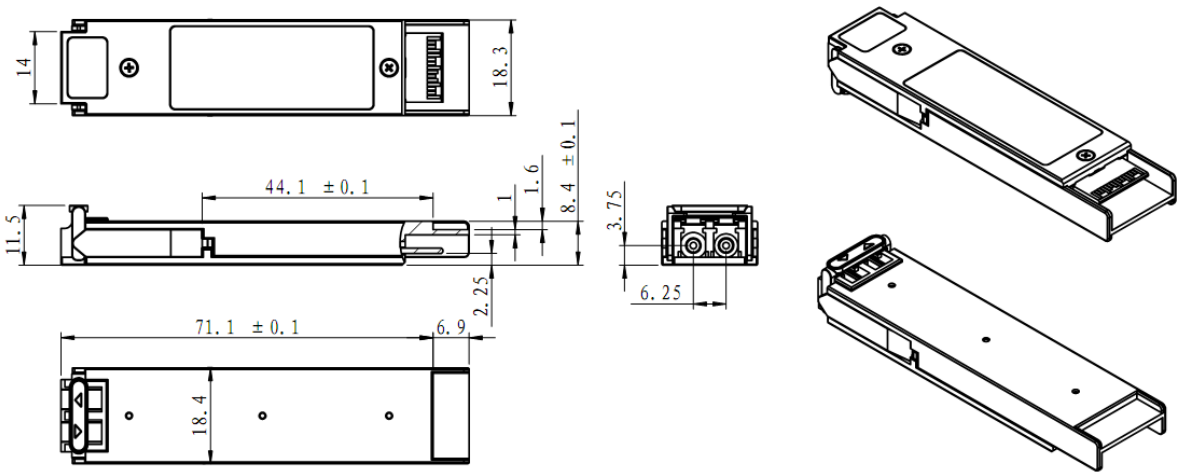


Recommended High-speed Interface Circuit



Mechanical Specifications

DCI's XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



Eye Safety

This single-mode transceiver is a Class 1 laser product. It complies with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

Contact

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