XFP-LR

XFP Dual Fiber Single-Mode Tranceiver for 10GbE/10GFC/SDH/ SONET

Features

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- Distance 10 km
- Built-in Digital Diagnostics

Applications

- OC192/ STM 64
- 10GBASE-ZR/ZW 10G Ethernet
- 10GE over G.709 at 11.09Gbps
- 1200-SM-LL-L 10G Fiber Channel

Product Description

The XFP-LR (10GbE Gigabit Small Form Factor Pluggable) is a hot - swappable, protocol independent optical transceiver, operating at 1310nm, for 10 Gigabit per second SONET/SDH, Fibre Channel, gigabit Ethernet, 10 gigabit Ethernet and other applications. It includes digital diagnostics similar to SFF-8472 but more extensive, that provide a robust management tool. The XFI electrical interface specification is a portion of the XFP Multi Source Agreement specification. OC-192 / STM-64 is a network line with transmission speeds of up to 9953.28 Mbit/s (payload: 9621.504 Mbit/s; overhead: 331.776 Mbit/s).

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Opticonnect SYSTEMS B.V., an Optical Networking vendor with its headquarters in the Netherlands, provides Optical Transport solutions and Optical Transceivers at the best price performance ratio possible. Our goal is to simplify the planning, deployment and maintenance of complex Optical Networks. This is achieved by our user friendly planning apps and information, sophisticated products and transparent support. Relying on our superior product quality, all items are supplied with life time warranty.

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Interface	Temp.
XFP-LR	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*note1

Note1: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1th, 2007, which meet the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.
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 Opticonnect's transceivers, because Opticonnect's 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_{OP}	0		70	°C	

Recommend operating condition

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

Electrical Characteristics

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	VLOS fault	Vcc – 0.5		VccHOST	V
LOS Normal*3	VLOS 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 Characteristic

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 trans-mitter	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			-18	dBm
LOS Assert	LOSA	-32			dBm
LOS Hysteresis		1			dB