

XFP-LR

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



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, Fiber 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).

Features

- Data Rate 9.95Gb/s up to 11.3Gb/s
- Distance 10 km
- Hot-pluggable
- Duplex LC connector
- Power dissipation <2.5W
- Compliant with MSA
- Digital Diagnostics

Applications

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



All product specifications are subject to change without notice to improve reliability, function or design or otherwise.

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 | V _{CC3} | -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 | V_{CC3} | 3.13 | | 3.45 | V |
| Case operating temperature | XFP-LR | 0 | | 70 | °C |

Electrical characteristics

| Parameter | Symbol | Min | Typ | Max | Unit |
|----------------------------------|------------|----------------|-----|----------------|----------|
| Supply voltage | V_{CC3} | 3.13 | | 3.45 | V |
| Supply current | I_{CC3} | | | 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 | | V_{CC} | V |
| Transmit enable voltage | V_{EN} | GND | | GND+ 0.8 | V |
| Transmit disable assert time | | | | 10 | μ s |
| 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 | $V_{CC} - 0.5$ | | V_{CC_HOST} | 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 transmitter | P_{OFF} | -30 | | | dBm |
| Tx jitter | Txj | Compliant with each standard requirements | | | |

| Parameter | Symbol | Min | Typ | Max | Unit |
|---------------------------------|-------------|-------|-----|-------|------|
| 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 |