

SFP-10GBASE-LR-2-I-C-C

Cisco® Compatible TAA Compliant 10GBase-LRL SFP+ Transceiver (SMF, 1310nm, 2km, LC, DOM, -40 to 85C)

Features:

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Uncooled DFB transmitter and PIN receiver
- Single-mode Fiber
- Industrial Temperature -40 to 85 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



Applications:

- 6GBase/10GBase-LRL Ethernet
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

Product Description

This Cisco® compatible SFP+ transceiver provides 10GBase-LRL Multi-Rate throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products.")



Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|----------------------------|-----------------|------|---------|-------------------|------|-------|
| Maximum Supply Voltage | V _{cc} | -0.5 | | 4 | V | 1 |
| Storage Temperature | T _S | -40 | | 85 | °C | 2 |
| Operating Case Temperature | T _c | -40 | | 85 | °C | 3 |
| Data Rate | DR | 9.83 | 10.3125 | 11.3 | Gbps | 4 |
| Bit Error Rate | BER | | | 10 ⁻¹² | | |

Notes:

1. For electrical power interface
2. Ambient Temperature
3. Case Temperature
4. IEEE 802.3ae

Link Distances

| Data Rate | Fiber Type | Distance Range (km) |
|-----------------|-------------|---------------------|
| 9.83 –11.3 Gb/s | 9/125um SMF | 2 |

Electrical Characteristics (V_{CC}=3.14V to 3.46V, T_C=-0°C to 70°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------------|--------------------------------|-----------------|------|----------------------|------|-------|
| Power Supply Voltage | V _{cc} | 3.14 | 3.30 | 3.46 | V | |
| Power Supply Current | I _{cc} | | 230 | 300 | mA | |
| Transmitter | | | | | | |
| Differential data input swing | V _{IN,pp} | 180 | | 700 | mV | |
| Input differential impedance | R _{IN} | | 100 | | Ω | |
| Transmit Disable Voltage | V _D | 2 | | V _{cc} | V | |
| Transmit Enable Voltage | V _{EN} | V _{EE} | | V _{EE} +0.8 | V | |
| Receiver | | | | | | |
| Differential data output swing | V _{OUT, pp} | 300 | | 850 | mV | |
| Data output rise/fall time (20%-80%) | T _r /T _f | 28 | | | ps | |
| LOS Asset | V _{LOSA} | 2 | | Host_V _{cc} | V | |
| LOS De-Assert | V _{LOSD} | V _{cc} | | V _{cc} +0.5 | V | |

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---------------------------------|-------------|-------|------|-------|-------|-------|
| Transmitter | | | | | | |
| Output Optical Power | Ptx | -8.2 | | 0.5 | dBm | 1 |
| Optical Center Wavelength | λ_c | 1260 | 1310 | 1355 | nm | |
| Optical Modulation Amplitude | OMA | -5.2 | | | dBm | 2 |
| Extinction Ratio | ER | 3.5 | | | dB | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Relative Intensity Noise | RIN | | | -128 | dB/Hz | |
| Transmitter Dispersion Penalty | TDP | | | 3.2 | dB | |
| Launch Power of OFF Transmitter | Poff | | | -30 | dBm | 1 |
| Receiver | | | | | | |
| Optical Center Wavelength | λ_c | 1260 | | 1355 | nm | |
| Average Receive Power | Prx | -14.4 | | 0.5 | dBm | |
| Receiver Sensitivity @10.3Gb/s | S | | | -14.4 | dBm | 3 |
| Receiver Reflectance | RL | | | -12 | dB | |
| LOS Assert | LOSA | -30 | | | dBm | |
| LOS De-Assert | LOSD | | | -15 | dBm | |
| LOS Hysteresis | LOSH | 0.5 | | | dB | |

Notes:

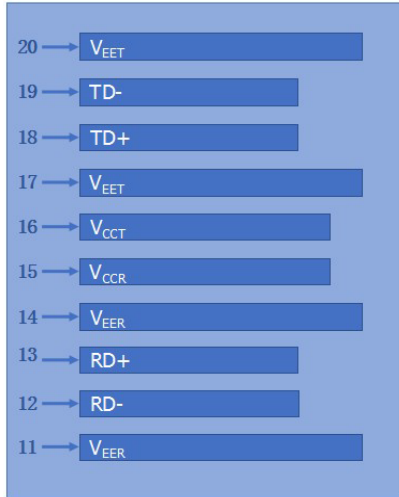
1. Average.
2. According to IEEE 802.3ae requirement.
3. Average. Test the resulting value using the minimum ER value within the defined range: $BER < 10^{-12}$, PRBS $2^{31}-1$.

Pin Descriptions

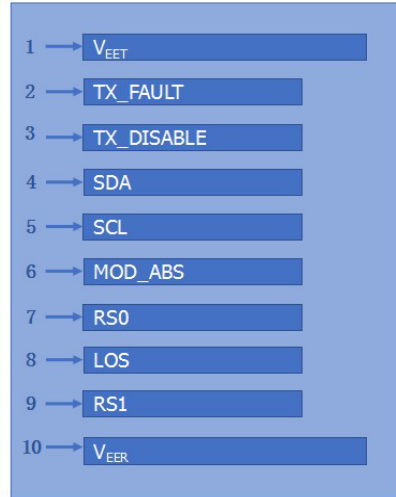
| Pin | Symbol | Name/Descriptions | Ref. |
|-----|------------|---|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground). | 1 |
| 2 | Tx_Fault | Transmitter Fault. | 2 |
| 3 | Tx_Disable | Transmitter Disable. Laser output disabled on "high" or "open." | 3 |
| 4 | SDA | 2-Wire Serial Interface Data Line. | 4 |
| 5 | SCL | 2-Wire Serial Interface Clock Line. | 4 |
| 6 | MOD_ABS | Module Absent. Grounded within the module. | 4 |
| 7 | RS0 | No connection required. | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation | 5 |
| 9 | RS1 | No connection required. | 1 |
| 10 | VeeR | Receiver Ground (Common with Transmitter Ground). | 1 |
| 11 | VeeR | Receiver Ground (Common with Transmitter Ground). | 1 |
| 12 | RD- | Receiver Inverted Data Out. AC Coupled. | |
| 13 | RD+ | Receiver Non-Inverted Data Out. AC Coupled. | |
| 14 | VeeR | Receiver Ground (Common with Transmitter Ground). | 1 |
| 15 | VccR | Receiver Power Supply | |
| 16 | VccT | Transmitter Power Supply | |
| 17 | VeeT | Transmitter Ground (Common with Receiver Ground). | 1 |
| 18 | TD+ | Transmitter Non-Inverted Data In. AC Coupled. | |
| 19 | TD- | Transmitter Inverted Data In. AC Coupled. | |
| 20 | VeeT | Transmitter Ground (Common with Receiver Ground). | 1 |

Notes:

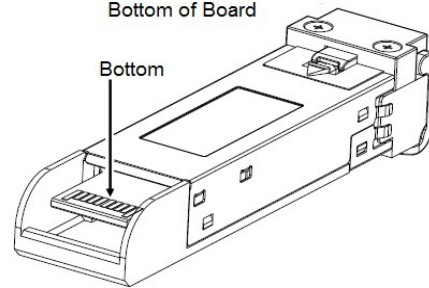
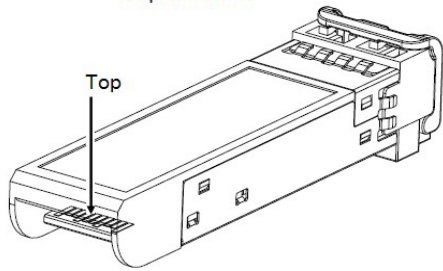
1. Circuit ground is isolated from the chassis ground.
2. Tx_Fault is the open collector output and should be pulled up with 4.7kΩ-10kΩ on the host board to a voltage between 2V and Vcc+0.3V.
3. Disabled: T_{DIS}>2V or open, enabled: T_{DIS}<0.8V.
4. Should be pulled up with 4.7kΩ-10kΩ on the host board to a voltage between 2V and Vcc+0.3V.
5. LOS is an open collector output and should be pulled up with 4.7kΩ-10kΩ on the host board to a voltage between 2V and Vcc+0.3V. The logic "0" indicates normal operation, and the logic "1" indicates that the receiver signal is lost.



Top of Board

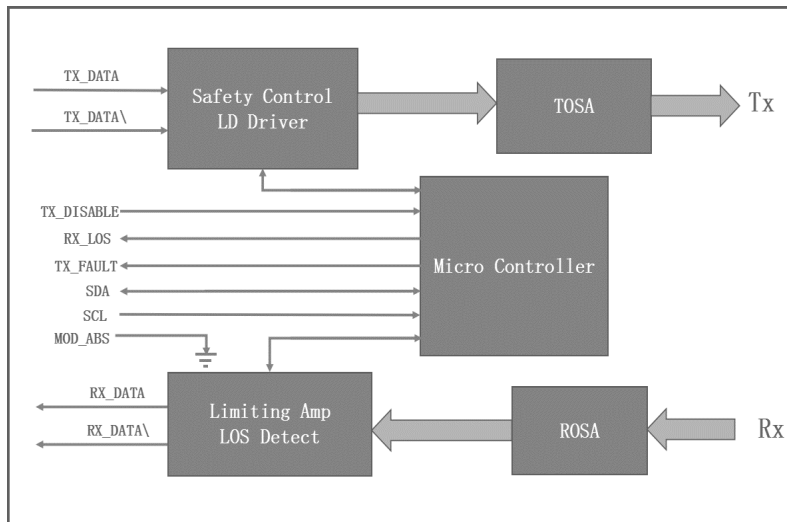


Bottom of Board



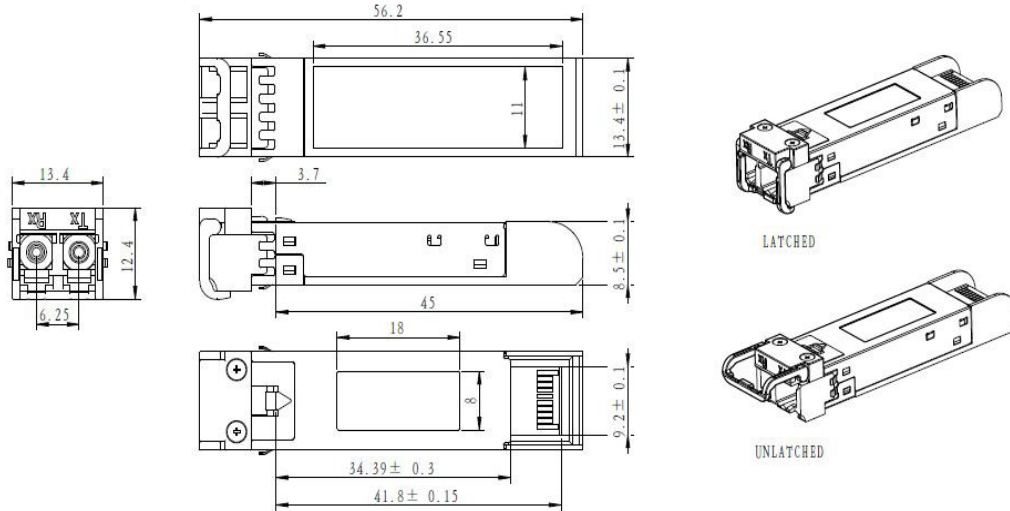
Pin-out of connector Block on Host board

Block Diagram



Mechanical Specifications

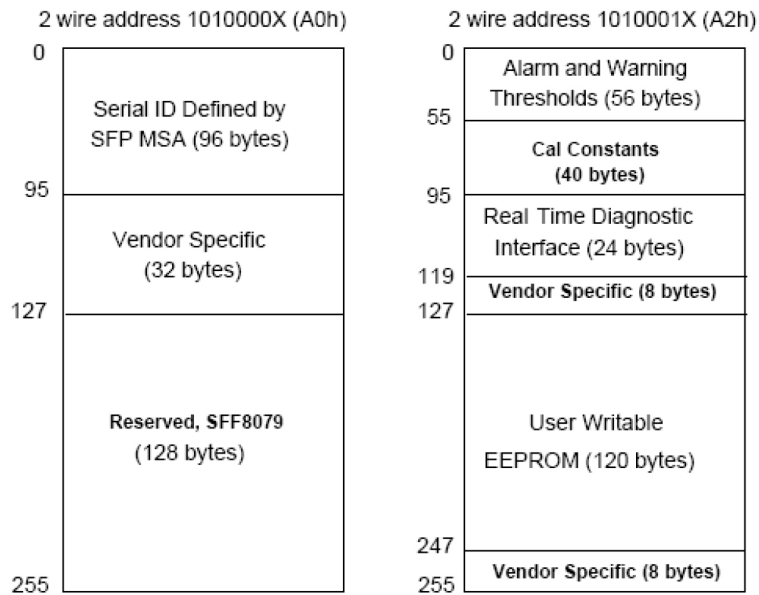
Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

EEPROM Information

EEPROM memory map specific data field description is as below:



About ProLabs

Our extensive experience comes as standard. For over 20 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with more than 100 optical switching and transport platforms.

A Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 1.6T while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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