



### **SFP-10GBASE-ER31-C-OPC**

Cisco® Compatible TAA Compliant 10GBase-ER SFP+ Transceiver (SMF, 1310nm, 40km, LC, DOM)

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### **Applications:**

- 10GBase-LR Ethernet
- 8x/10x Fibre Channel
- Access, Datacenter and Enterprise
- Mobile Fronthaul CPRI/OBSAI

#### **Product Description**

This Cisco® compatible SFP+ transceiver provides 10GBase-LR throughput up to 40km 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.

OptioConnect's transceivers are RoHS compliant and lead-free.

## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## Absolute Maximum Ratings

| Parameter                  | Symbol | Min. | Typ.    | Max. | Unit |
|----------------------------|--------|------|---------|------|------|
| Maximum Supply Voltage     | Vcc    | -0.5 |         | 4.0  | V    |
| Storage Temperature        | TS     | -40  |         | 85   | °C   |
| Operating Case Temperature | Ti     | 0    | 25      | 70   | °C   |
| Data Rate                  |        |      | 10.3125 |      | Gbps |

## Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

| Parameter                        |                      | Symbol    | Min.  | Typ. | Max.    | Unit  | Notes |
|----------------------------------|----------------------|-----------|-------|------|---------|-------|-------|
| Power Supply Voltage             |                      | Vcc       | 3.135 | 3.3  | 3.465   | V     |       |
| Power Supply Current             |                      | Icc       |       |      | 300     | mA    |       |
| Power Dissipation                |                      | PD        |       |      | 1000    | mW    |       |
| Transmitter                      |                      |           |       |      |         |       |       |
| Input Differential Impedance     |                      | Zin       |       | 100  |         | Ω     |       |
| Differential Data Input Swing    |                      | Vin,p-p   | 180   |      | 700     | mVp-p |       |
| TX_FAULT                         | Transmitter Fault    | VOH       | 2.0   |      | Vcchost | V     |       |
|                                  | Normal Operation     | VOL       | 0     |      | 0.8     | V     |       |
| TX_DISABLE                       | Transmitter Disable  | VIH       | 2.0   |      | Vcchost | V     |       |
|                                  | Transmitter Enable   | VIL       | 0     |      | 0.8     | V     |       |
| Receiver                         |                      |           |       |      |         |       |       |
| Output Differential Impedance    |                      | Zo        |       | 100  |         | Ω     |       |
| Differential Data Output Swing   |                      | VOUT, P-P | 300   |      | 850     | mVp-p | 1     |
| Data Output Rise Time, Fall Time |                      | tr, tf    | 28    |      |         | ps    | 2     |
| RX_LOS                           | Loss of signal (LOS) | VOH       | 2.0   |      | Vcchost | V     | 3     |
|                                  | Normal Operation     | VOL       | 0     |      | 0.8     | V     | 3     |

### Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.
2. 20-80%.
3. LOS is an open collector output. Should be pulled up with 4.7kΩ on the host board.

## Optical Characteristics

| Parameter                                | Symbol                                                  | Min. | Typ. | Max.  | Unit | Notes |
|------------------------------------------|---------------------------------------------------------|------|------|-------|------|-------|
| Transmitter                              |                                                         |      |      |       |      |       |
| Launch Optical Power                     | P <sub>o</sub>                                          | 0    |      | +5    | dBm  | 1     |
| Center Wavelength Range                  | λ <sub>c</sub>                                          | 1260 | 1310 | 1355  | nm   |       |
| Extinction Ratio                         | ER                                                      | 3.5  |      |       | dB   | 2     |
| Optical Modulation Amplitude             | OMA                                                     | -5.2 |      |       | dBm  |       |
| Spectral Width (-20dB)                   | Δλ                                                      |      |      | 1     | nm   |       |
| Side Mode Suppression Ratio              | SMSR                                                    | 30   |      |       | dB   |       |
| Transmitter and Dispersion Penalty       | TDP                                                     |      |      | 3.2   | dB   |       |
| Optical Return Loss Tolerance            | ORLT                                                    |      |      | 12    | dB   |       |
| Pout @TX_Disable Asserted                | P <sub>off</sub>                                        |      |      | -30   | dBm  | 1     |
| Eye Diagram                              | IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ER compatible |      |      |       |      |       |
| Receiver                                 |                                                         |      |      |       |      |       |
| Center Wavelength                        | λ <sub>c</sub>                                          | 1260 | 1310 | 1355  | nm   |       |
| Receiver Sensitivity (P <sub>avg</sub> ) | S                                                       |      |      | -15   | dBm  | 3     |
| Receiver Overload (P <sub>avg</sub> )    | P <sub>OL</sub>                                         | 0.5  |      |       | dBm  | 3     |
| Stressed Sensitivity (OMA)               |                                                         |      |      | -10.3 | dBm  | 4     |
| Optical Return Loss                      | ORL                                                     | 12   |      |       | dB   |       |
| LOS De-Assert                            | LOS <sub>D</sub>                                        |      |      | -16   | dBm  |       |
| LOS Assert                               | LOS <sub>A</sub>                                        | -30  |      |       | dBm  |       |
| LOS Hysteresis                           |                                                         | 0.5  |      | 4.5   | dB   |       |

### Notes:

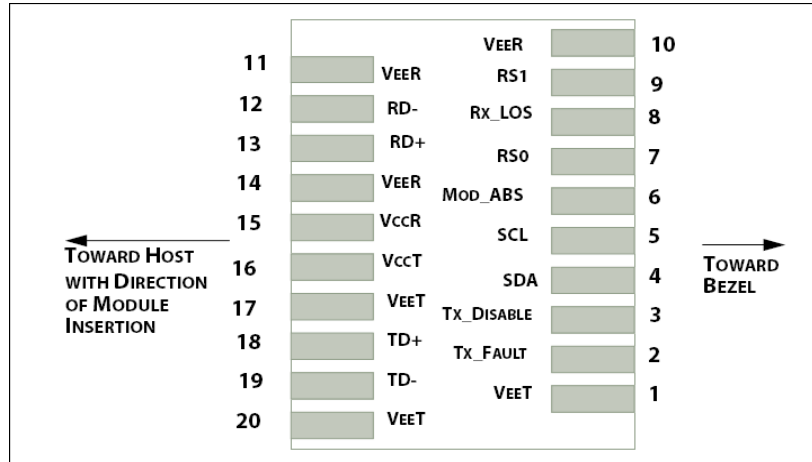
1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 10.3125 Gb/s, BER<10<sup>-12</sup>.
4. Comply with IEEE 802.3-2005.

## Pin Descriptions

| Pin | Symbol     | Name/Descriptions                                                     | Ref. |
|-----|------------|-----------------------------------------------------------------------|------|
| 1   | VeeT       | Transmitter Ground                                                    | 1    |
| 2   | TX_Fault   | Transmitter Fault (LVTTL-O) - High indicates a fault condition        | 2    |
| 3   | TX_Disable | Transmitter Disable (LVTTL-I) – High or open disables the transmitter | 3    |
| 4   | SDA        | Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)           | 4    |
| 5   | SCL        | Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)          | 4    |
| 6   | MOD_ABS    | Module Absent (Output), connected to VeeT or VeeR in the module       | 5    |
| 7   | RS0        | Rate Select 0 – Not used, Presents high input impedance               |      |
| 8   | RX_LOS     | Receiver Loss of Signal (LVTTL-O)                                     | 2    |
| 9   | RS1        | Rate Select 1 – Not used, Presents high input impedance               |      |
| 10  | VeeR       | Receiver Ground                                                       | 1    |
| 11  | VeeR       | Receiver Ground                                                       | 1    |
| 12  | RD-        | Inverse Received Data out (CML-O)                                     |      |
| 13  | RD+        | Received Data out (CML-O)                                             |      |
| 14  | VeeR       | Receiver Ground                                                       |      |
| 15  | VccR       | Receiver Power - +3.3V                                                |      |
| 16  | VccT       | Transmitter Power - +3.3 V                                            |      |
| 17  | VeeT       | Transmitter Ground                                                    | 1    |
| 18  | TD+        | Transmitter Data In (CML-I)                                           |      |
| 19  | TD-        | Inverse Transmitter Data In (CML-I)                                   |      |
| 20  | VeeT       | Transmitter Ground                                                    | 1    |

## Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.



### Recommended Host Board Power Supply Filter Network

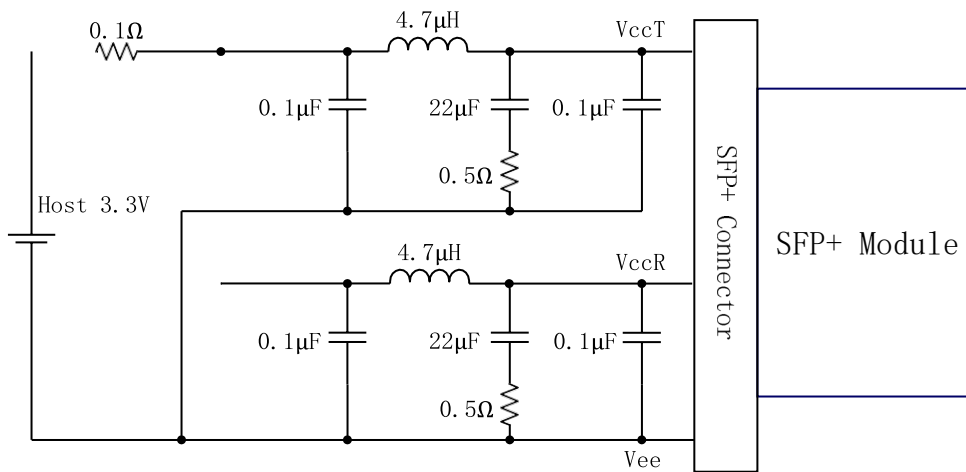
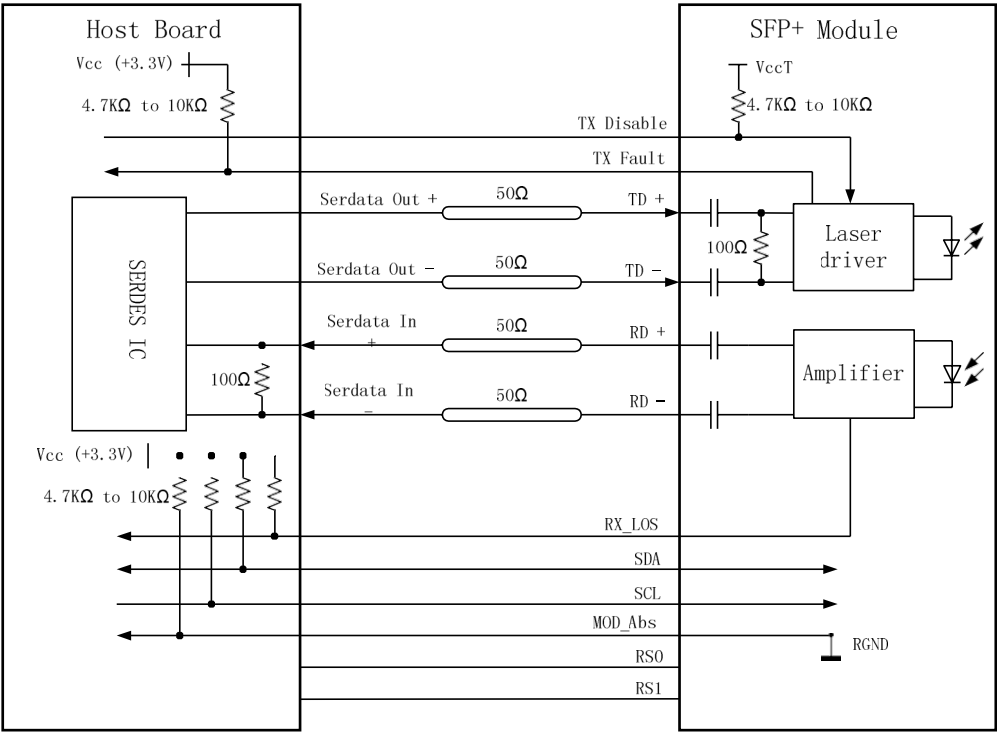


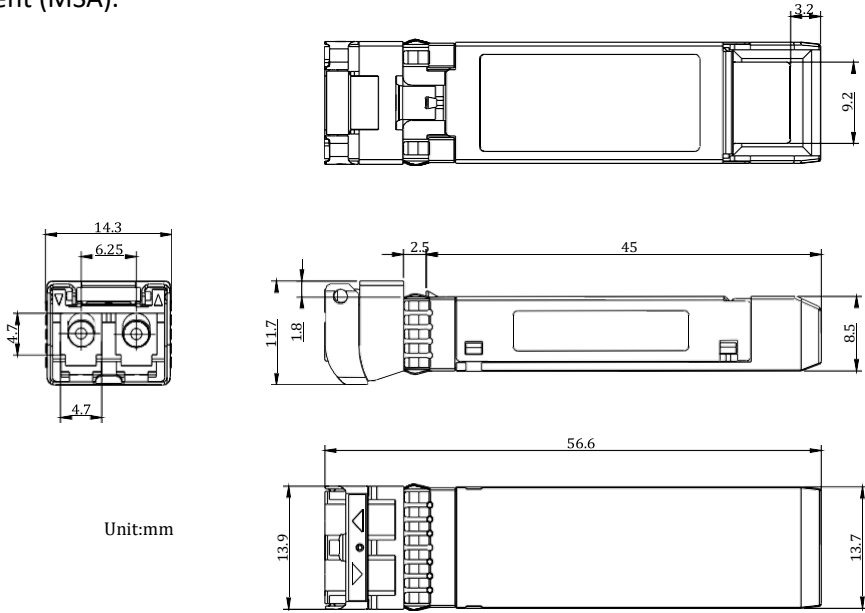
Figure 2. Recommended Host Board Power Supply Filter Network

Recommended Application Interface Block Diagram



Mechanical Specifications

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



## **OptioConnect**

### **Innovation for the Future of High-Speed Networking**

#### **Who We Are**

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

#### **What We Do**

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

#### **Smarter Networks by Design**

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

#### **Our Team**

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

#### **Our Mission**

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

#### **Let's Connect**

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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