

SFP-50GBASE-LR-C

MSA and TAA 50GBase-LR SFP56 Transceiver (SMF, 1310nm, 10km, LC, DOM)

Features:

- SFF-8431 and SFF-8472 Compliance
- SFP56 package with duplex LC connector
- Up to 53Gb/s bi-directional data links
- Single-mode Fiber
- Cooled 1310 EML Transmitter
- PIN Receiver
- Build-in DSP
- Single +3.3V power supply
- Class 1 laser safety certified
- 2.5W maximum power consumption
- Operating Temperature: 0C to 70C
- RoHS Compliant



Applications:

- 50GBase Ethernet
- Access and Enterprise

Product Description

This MSA and TAA compliant SFP56 transceiver provides 25GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.")



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 | V _{cc} | -0.5 | | 4.0 | V |
| Storage Temperature | T _S | -40 | | 85 | °C |
| Operating Case Temperature | T _c | 0 | 25 | 70 | °C |
| Relative Humidity | RH | 5 | | 95 | % |
| Data Rate | | | 53.13 | | Gbps |

Electrical Characteristics (TOP=25°C, V_{cc}=3.3Volts)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Notes |
|----------------------------------|----------------------|---------------------------------|-------|------|---------------------|-------|-------|
| Power Supply Voltage | | V _{cc} | 3.135 | 3.3 | 3.465 | V | |
| Module Supply Current | | I _{cc} | | | 760 | mA | |
| Power Dissipation | | P _D | | | 2500 | mW | |
| Transmitter | | | | | | | |
| Differential data input swing | | V _{in} , p-p | | | 900 | mVp-p | |
| Input differential impedance | | Z _{in} | 90 | 100 | 110 | Ω | |
| TX_FAULT | Transmitter Fault | V _{OH} | 2.0 | | V _{CCHOST} | V | |
| | Normal Operation | V _{OL} | 0 | | 0.8 | V | |
| TX_DISABLE | Transmitter Disable | V _{IH} | 2.0 | | V _{CCHOST} | V | |
| | Transmitter Enable | V _{IL} | 0 | | 0.8 | V | |
| Receiver | | | | | | | |
| Differential data output swing | | V _{out} , p-p | | | 900 | mVp-p | 1 |
| Output differential impedance | | Z _o | 90 | 100 | 110 | Ω | |
| Data Output Rise Time, Fall Time | | t _r , t _f | 9.5 | | | ps | 2 |
| RX_LOS | Loss of signal (LOS) | V _{OH} | 2.0 | | V _{CCHOST} | V | 3 |
| | Normal Operation | V _{OL} | 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 4.7k Ω on the host board.

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|------------------|--------|------|--------|------|-------|
| Transmitter | | | | | | |
| Launch Optical Power (average) | P _{AV} | -4.5 | | +4.2 | dBm | 1 |
| Launch Optical Power (OMA) | P _O | -1.5 | | +4 | dBm | 1 |
| TDECQ (50G PAM4) | TDECQ | | | 3.2 | dB | |
| Extinction Ratio | ER | 3.5 | | | dB | |
| Center Wavelength Range | λ_c | 1304.5 | | 1317.5 | nm | |
| Spectral Width | $\Delta\lambda$ | | | 1 | nm | 2 |
| Side Mode suppression Ratio | SMSR | 35 | | | dB | |
| Optical Return Loss Tolerance | ORLT | | | 15.1 | dB | |
| Pout @TX-Disable Asserted | P _{off} | | | -30 | dBm | |
| Receiver | | | | | | |
| Receiver Sensitivity (average) | R _{AV} | | | -10.8 | dBm | 3 |
| Receiver Sensitivity (OMA) | R _{OMA} | | | -7.7 | dBm | 3 |
| Receiver Overload | P _{av} | +4.2 | | | dBm | |
| Optical Wavelength Range | λ_c | 1260 | | 1340 | nm | |
| Receiver Reflectance | | | | -26 | dB | |
| LOS De-Assert | LOS _D | | | -12 | dBm | |
| LOS Assert | LOS _A | -20 | | | dBm | |
| LOS Hysteresis | | 0.5 | | | dB | |

Notes:

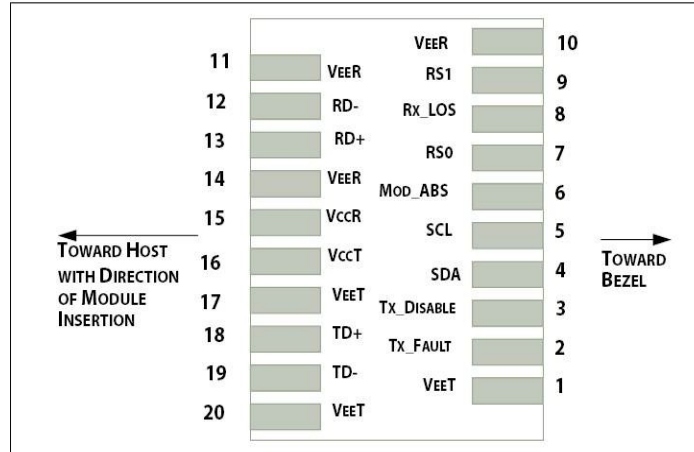
1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Measured with PRBS 2³¹-1 at 2.4 $\times 10^{-4}$ BER.

Pin Descriptions

| Pin | Symbol | Name/Descriptions | Notes |
|-----|------------|------------------------------------------------------------------------|-------|
| 1 | VeeT | Transmitter Ground | 1 |
| 2 | TX_Fault | Transmitter Fault (LVTTTL-O) - High indicates a fault condition | 2 |
| 3 | TX_Disable | Transmitter Disable (LVTTTL-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 | NA | 6 |
| 8 | RX_LOS | Receiver Loss of Signal (LVTTTL-O) | 2 |
| 9 | RS1 | NA | 6 |
| 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 |

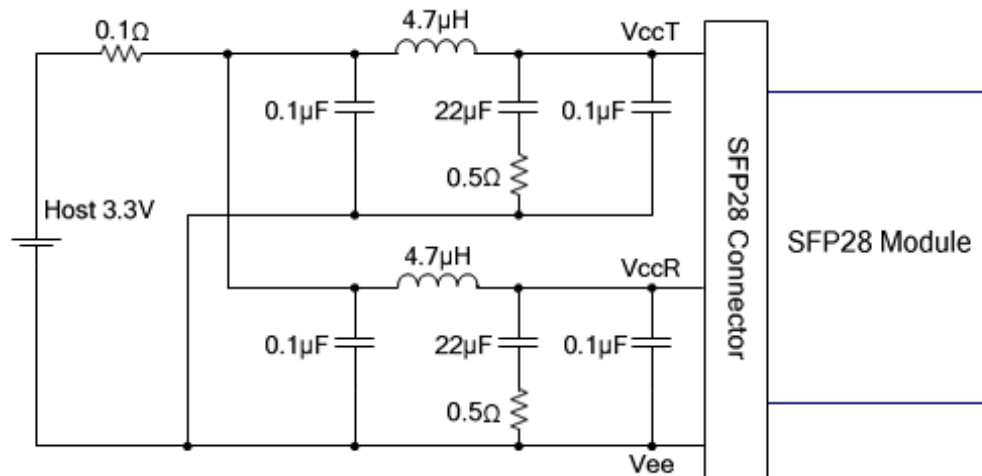
Notes:

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 4.7KΩ to 10KΩ pull-up resistor to Vcc-Host.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor.
5. This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to Vcc-Host.
6. Rate select not available

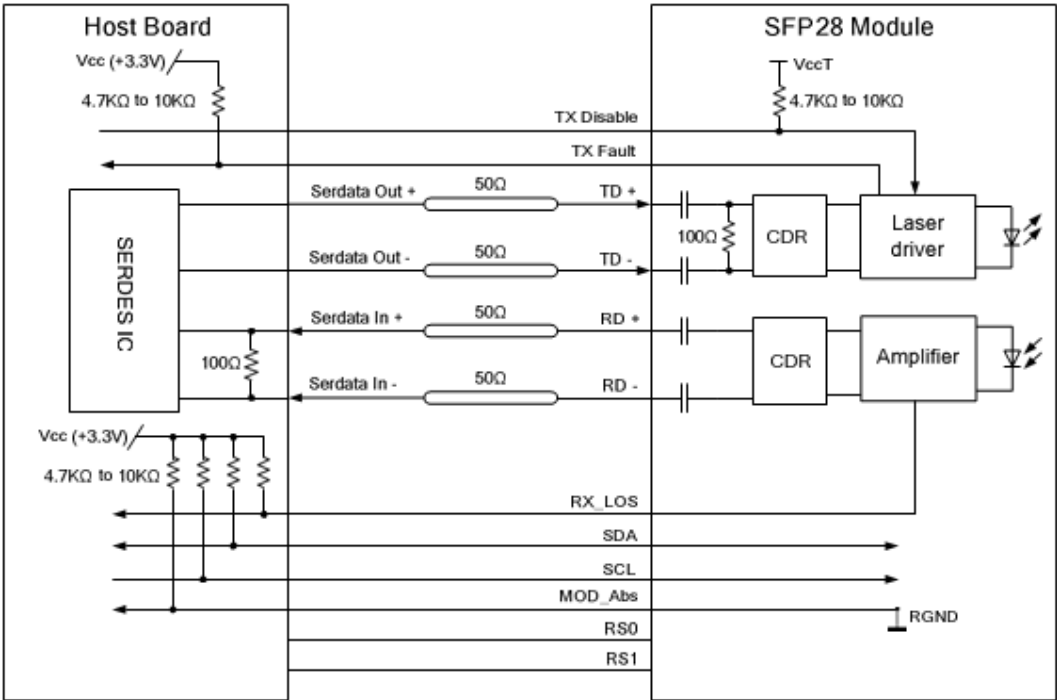


Host PCB SFP28 Pad Assignment Top View

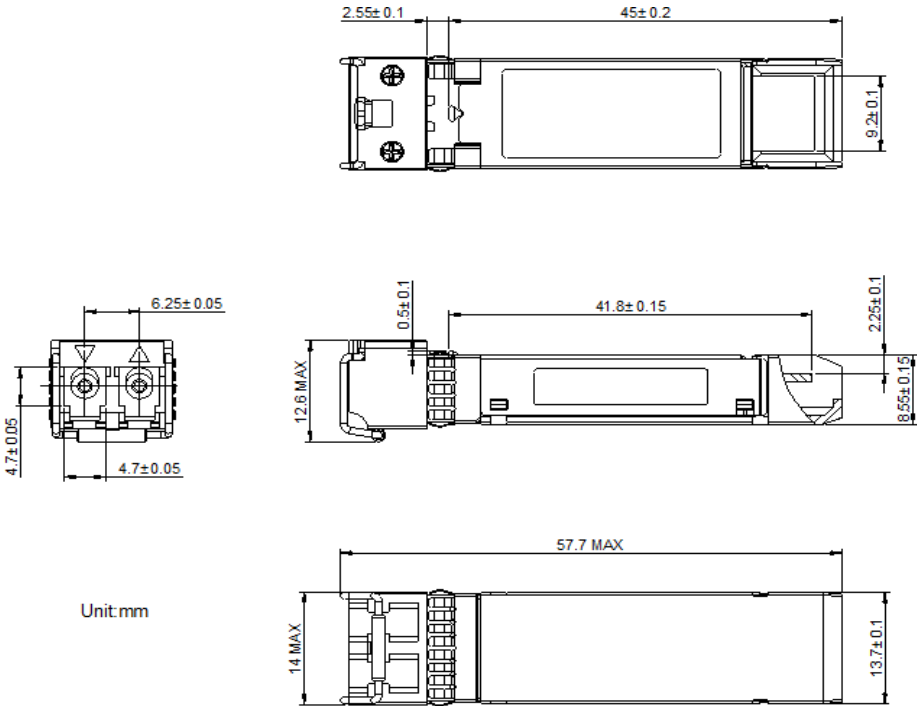
Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



Mechanical Specifications



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.



Contact Information

ProLabs US

Email: sales@prolabs.com

Telephone: 952-852-0252

ProLabs UK

Email: salesupport@prolabs.com

Telephone: +44 1285 719 600