**E25GSFP28LR-C**

Intel® E25GSFP28LR Compatible TAA 25GBase-LR SFP28 Transceiver (SMF, 1310nm, 10km, LC, DOM)

**Features:**

- SFF-8402 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:**

- 25GBase Ethernet
- Access and Enterprise

**Product Description**

This Intel® E25GSFP28LR compatible SFP28 transceiver provides 25GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Intel® 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."

**Rev. 121522**

**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 | Notes |
|---|---|---|---|---|---|---|
| **Storage Temperature** | Ts | -40 | | 85 | ˚C | |
| **Relative Humidity** | RH | 5 | | 95 | % | |
| **Supply Voltage** | Vcc | -0.5 | | 4.0 | V | |
| **Operating Case Temperature** | Tc | 0 | 25 | 70 | ˚C | |
| **Data Rate** | BR | | 25.78 | | Gb/s | |
| **Bit Error Rate** | BER | | | $5x10^{-5}$ | | 1 |
| **Supported Link Length on 9/125um SMF, 25.78GB/s** | L | | 10 | | km | 2 |

**Notes:**

1. Tested with a PRBS $2_{31}$-1 test pattern for 25.78Gb/s operation.
2. Distances are based on FC-PI-6 Rev 3.1 and IEEE 802.3 standards.

**Electrical Characteristics**

| Parameter | | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|---|
| **Supply Voltage** | | Vcc | 3.135 | 3.3 | 3.465 | V | |
| **Data Rate** | | | | 25.78 | | GB/s | |
| **Module Supply Current** | | Icc | | | 450 | mA | |
| **Power Dissipation** | | $P_D$ | | | 1500 | mW | |
| **Transmitter** | | | | | | | |
| **Input Differential Impedance** | | $Z_{IN}$ | | 100 | | Ω | |
| **Differential Data Input Swing** | | $V_{IN, P-P}$ | 180 | | 700 | $mV_{P-P}$ | |
| **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** | | | | | | | |
| **Output Differential Impedance** | | $Z_O$ | | 100 | | Ω | |
| **Differential Data Output Swing** | | $V_{OUT, P-P}$ | 300 | | 850 | $mV_{P-P}$ | 1 |
| **Data Output Rinse Time, Fall Time** | | tr, tf | 15 | | | 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 a external 100Ω differential load termination.
2. 20-80%
3. LOS is an open collector output. Should be pulled up with 4.7Ω on the host board.

**Optical Characteristics**

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Launch Optical Power** | Po | -5 | | 2 | dBm | 1 |
| **Extinction Ratio** | ER | 4 | | | dB | |
| **Center Wavelength Range** | λc | 1295 | 1310 | 1325 | nm | |
| **Optical Modulation Amplitude** | OMA | 631 | | | uW | |
| **Transmitter Dispersion Penalty** | TDP | | | 2.7 | dB | |
| **Spectral Width** | Δλ | | | 1 | nm | 2 |
| **Optical Rise/Fall Time @25.78 Gb/s** | tr/tf | | | 15 | ps | 3 |
| **Optical Return Loss Tolerance** | ORLT | | | 12 | dB | |
| **Pout @TX-Disable Asserted** | $P_{OFF}$ | | | -30 | dBm | 1 |
| **Receiver** | | | | | | |
| **Center Wavelength** | λc | 1260 | 1310 | 1370 | nm | |
| **Receiver OMA Sensitivity** | RxSENS | | | -11.4 | dBm | 4 |
| **Receiver Overload (P avg)** | $P_{OL}$ | 2 | | | dBm | |
| **Optical Return Loss** | ORL | 26 | | | dB | |
| **LOS De-Assert** | $LOS_D$ | | | -13 | dBm | |
| **LOS Assert** | $LOS_A$ | -30 | | | 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. Unfiltered, 20-80%.
4. Measured with PRBS 231-1 at 5×10-5 BER.

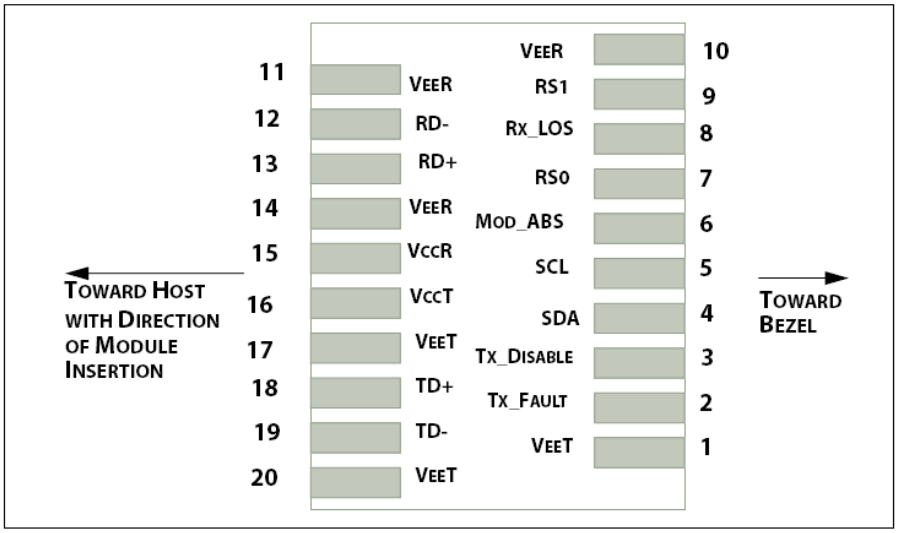
**Pin Description**

| Pin | Name | Description | Notes |
|---|---|---|---|
| **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** | RSO | | 6 |
| **8** | RX_LOS | Receiver Loss of Signal (LVTTL-O) | 2 |
| **9** | RS1 | | 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 |

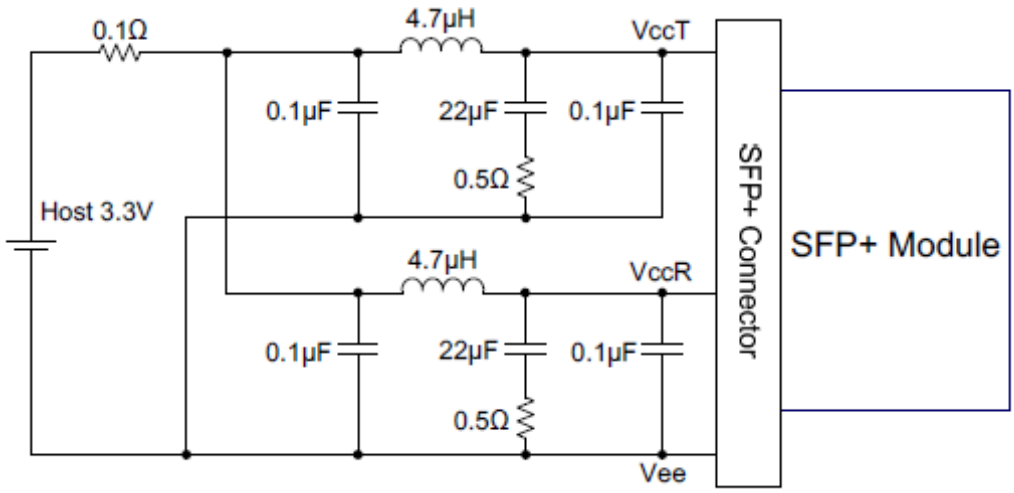
**Notes:**

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 VccHost.
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 dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 12.1, Rx Rate Select is set at Bit 3, Byte 110,
   Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.
   Note: writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

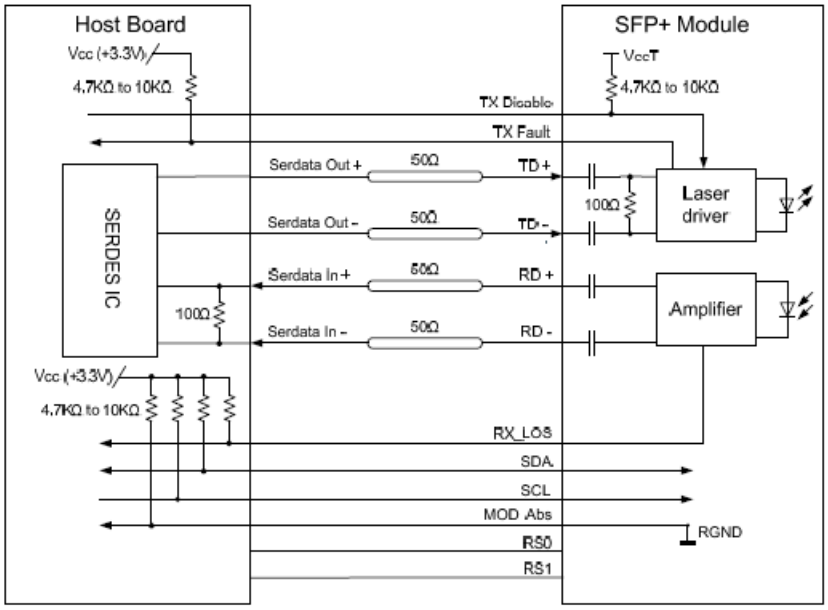
**Host PCB SFP28 pad assignment top view**



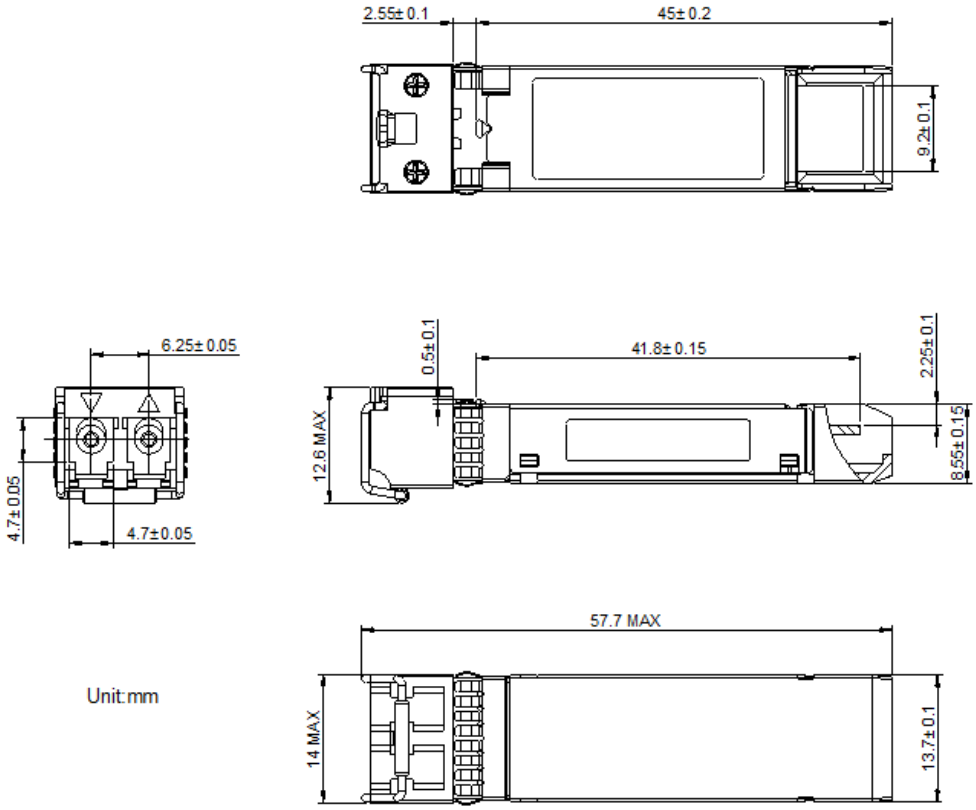

**Recommended Host Board Power Supply Filter Network**



## Recommended Application Interface Block Diagram




## Mechanical Specifications



**About ProLabs**

Our experience comes as standard; for over 15 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 over 90 optical switching and transport platforms.

**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 400G 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.

**Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. 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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