

1.25G 1310 2KM

Product Features

- Up to 1.25Gb/s dual data links
- Hot-pluggable SFP footprint
- 1310nm FP laser transmitter
- Duplex LC connector
- Up to 2km on 50/125µm MMF
- Metal enclosure for lower EMI
- Single +3.3V power supply
- Low power dissipation <600mW
- Commercial operating temperature range: 0°C to +70°C

Applications

- 1.25Gb/s 1000Base-SX Ethernet
- 1.06 Gb/s Fibre Channel

General

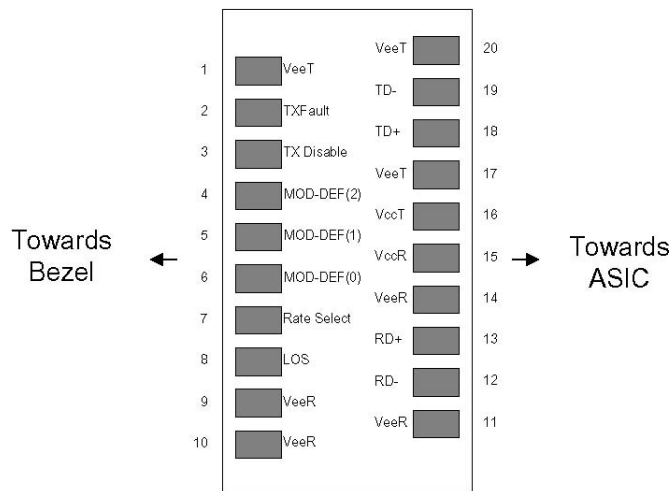
Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free.

I. Pin Descriptions

| Pin | Symbol | Name/Description | Ref. |
|-----|-------------|--|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TX Fault | Transmitter Fault. | |
| 3 | TX Disable | Transmitter Disable. Laser output disabled on high or open. | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 3 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 3 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 4 |
| 9 | VeeR | Receiver Ground (Common with Transmitter Ground) | 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 internally isolated from chassis ground.
2. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable <0.8V.
3. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is LVTTTL output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.



Pinout of Connector Block on Host Board

II. Absolute Maximum Ratings

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|----------------------------|--------|------|-----|------|------|------|
| Maximum Supply Voltage | Vcc | -0.5 | | +4.0 | V | |
| Storage Temperature | TS | -40 | | +100 | °C | |
| Case Operating Temperature | TOP | 0 | | +70 | °C | |
| Relative Humidity | RH | 0 | | 85 | % | 1 |

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

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|-----------------------------------|------------|-----------|-----|----------|------|------|
| Supply Voltage | Vcc | 3.00 | | 3.60 | V | |
| Supply Current | Icc | | 160 | 300 | mA | |
| Transmitter | | | | | | |
| Input differential impedance | Rin | | 100 | | Ω | 2 |
| Single ended data input swing | Vin, pp | 250 | | 1200 | mV | |
| Transmit Disable Voltage | VD | Vcc – 1.3 | | Vcc | V | |
| Transmit Enable Voltage | VEN | Vee | | Vee+ 0.8 | V | |
| Transmit Disable Assert Time | | | | 10 | us | |
| Receiver | | | | | | |
| Single ended data output swing | Vout, pp | 300 | 400 | 800 | mV | 3 |
| Data output rise time | tr | | | 300 | ps | 4 |
| Data output fall time | tf | | | 300 | ps | 4 |
| LOS Fault | VLOS fault | Vcc – 0.5 | | VccHOST | V | 5 |
| LOS Normal | VLOS norm | Vee | | Vee+0.5 | V | 5 |
| Deterministic Jitter Contribution | RXΔDJ | | | 80 | ps | 6 |
| Total Jitter Contribution | RXΔTJ | | | 122.4 | ps | |

Notes:

1. Non condensing.
2. AC coupled.
3. Into 100 ohm differential termination.
4. 20 – 80 %
5. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and ΔDJ.

IV. Optical Characteristics (TOP=25°C, Vcc=3.3 Volts)

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|-----------------------------------|----------------|------|------|-------|------|------|
| Transmitter | | | | | | |
| Output Opt. Power | PO | -15 | - | -8 | dBm | 1 |
| Optical Wavelength | λ | 1275 | 1310 | 1350 | nm | |
| Spectral Width | σ | - | - | 3 | nm | |
| Optical Rise/Fall Time | tr/tf | - | 170 | 260 | ps | 2 |
| Deterministic Jitter Contribution | TX Δ DJ | - | - | 0.07 | UI | 3 |
| Total Jitter Contribution | TX Δ TJ | - | - | 0.007 | UI | |
| Optical Extinction Ratio | ER | 9 | - | - | dB | |
| Receiver | | | | | | |
| Average Rx Sensitivity | RSENS | - | - | -24 | dBm | 4 |
| Maximum Received Power | RXMAX | 0 | - | - | dBm | |
| Optical Center Wavelength | λ C | 1270 | - | 1600 | nm | |
| LOS De-Assert | LOSD | - | - | -25 | dBm | |
| LOS Assert | LOSA | -36 | - | - | dBm | |
| LOS Hysteresis | | 0.5 | - | - | dB | |

Notes:

1. Class 1 Laser Safety, Tested with 50/125 μ m MM fiber.
2. Unfiltered, 20-80%.
3. Measured with DJ-free data input signal .In actual application, output DJ will be the sum of input DJ and Δ DJ.
4. Measured with PRBS 2⁷-1 at 10⁻¹² BER .

V. General Specifications

| Parameter | Symbol | Min | Typ | Max | Units | Ref. |
|---|--------|-----|-----|-------------------|--------|------|
| Data Rate | BR | - | - | 1250 | Mb/sec | 1 |
| Bit Error Rate | BER | - | - | 10 ⁻¹² | | 2 |
| Max. Supported Link Length on 50/125 μ m MMF @ Gigabit Ethernet | LMAX | - | - | 2 | km | 3,4 |

Notes:

1. Gigabit Ethernet and 1x Fibre Channel compliant.
2. Tested with a PRBS 2⁷-1 data pattern.
3. Dispersion limited per FC-PI-2 Rev. 10.
4. Attenuation of 0.55 dB/km is used for the link length calculations. Please refer to the Optical Specifications in Table IV to calculate a more accurate link budget based on specific conditions in your application.

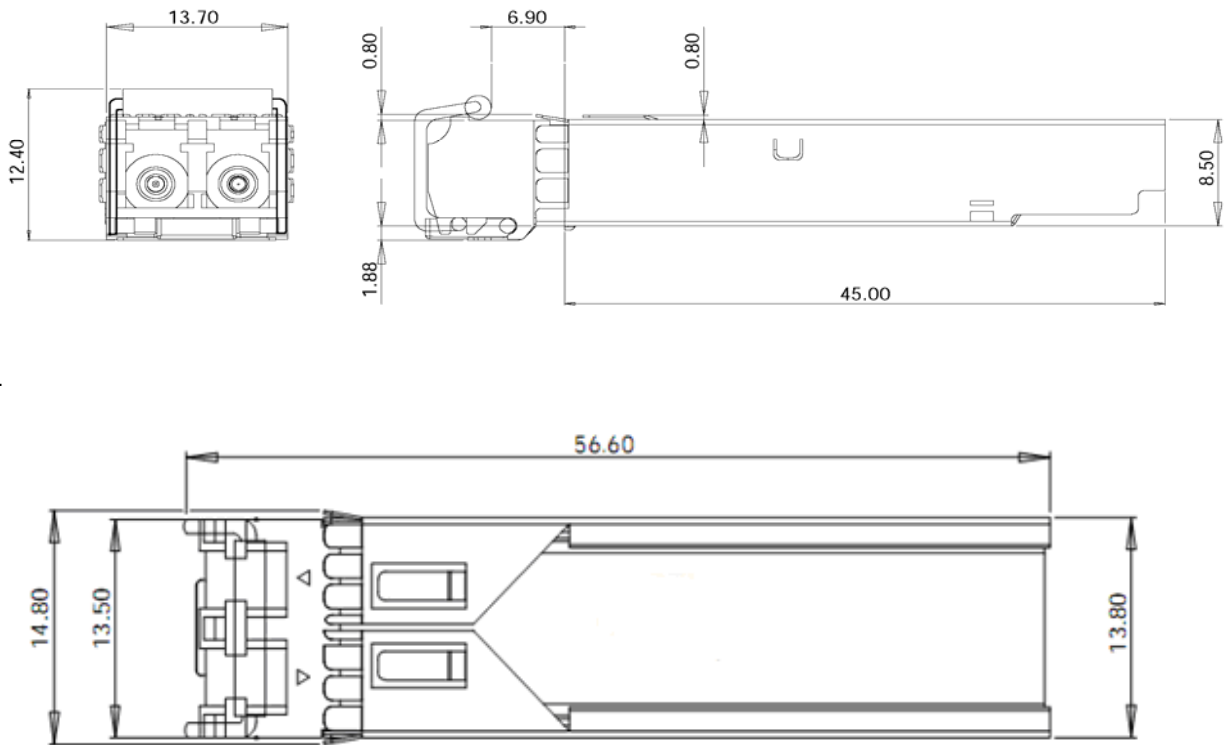
VI. Environmental Specifications

1310nm Commercial Temperature SFP transceivers have an operating temperature range from 0°C to +70°C case temperature.

| Parameter | Symbol | Min | Typ | Max | Units | Ref. |
|----------------------------|--------|-----|-----|------|-------|------|
| Case Operating Temperature | Top | 0 | | +70 | °C | |
| Storage Temperature | Tsto | -40 | | +100 | °C | |

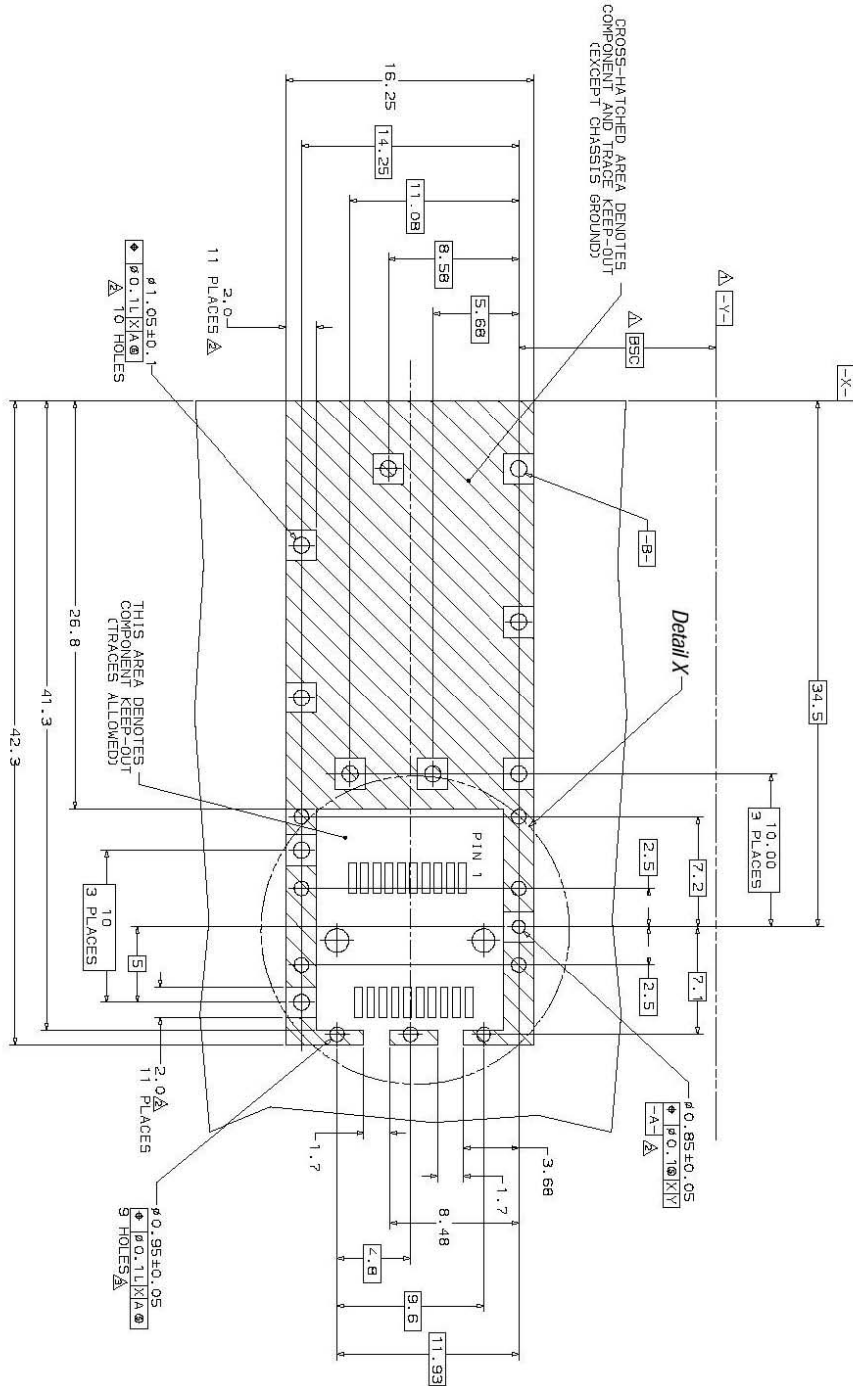
VII. Mechanical Specifications

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

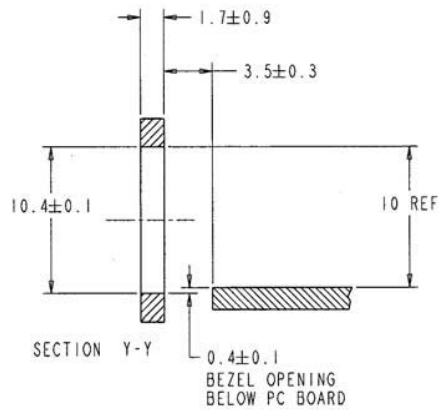
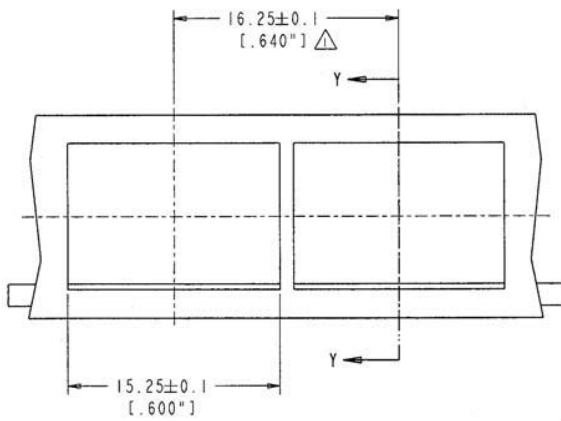
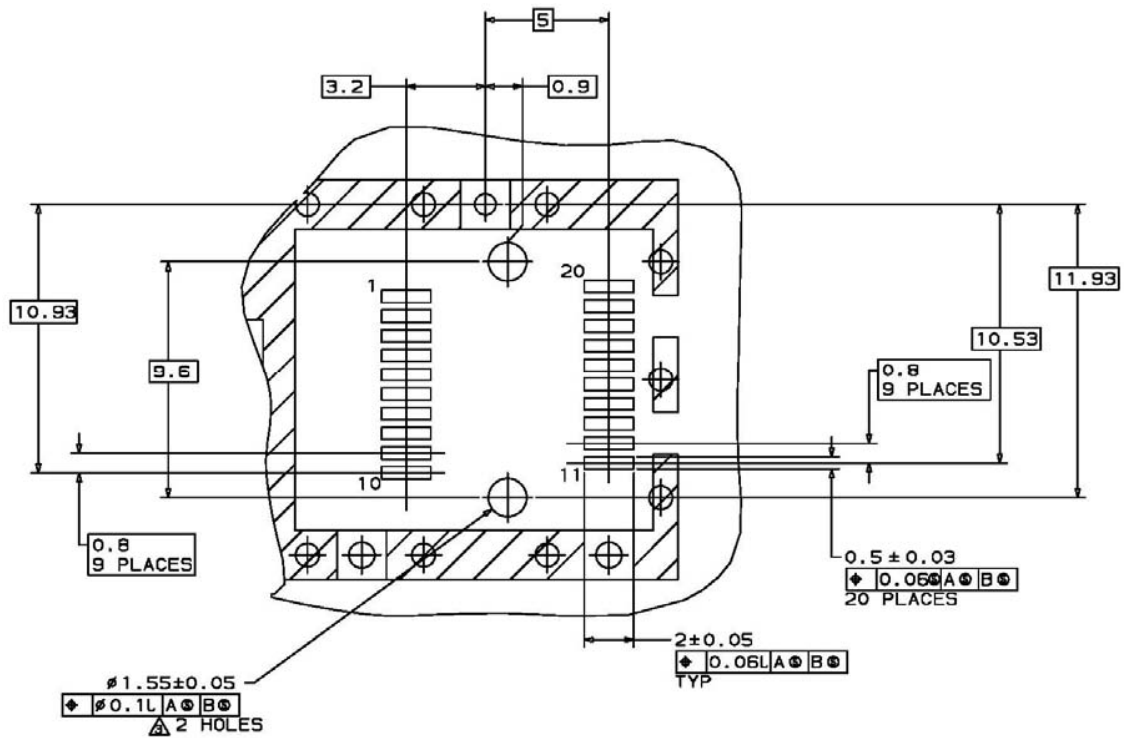


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IX. PCB Layout and Bezel Recommendations



-  Datum and Basic Dimension Established by Customer
-  Pads and Vias are Chassis Ground, 11 Places
-  Through Holes are Unplated



- NOTES:
- △ MINIMUM PITCH ILLUSTRATED, ENGLISH DIMENSIONS ARE FOR REFERENCE ONLY
 - NOT RECOMMENDED FOR PCI EXPANSION CARD APPLICATIONS

X. For More Information