

1000BASE-ZX SFP 1550nm 80KM DDM SMF Transceiver

P/N: QT-SFP-0380D



FEATURES

- Data-rate of 1.25Gbps operation
- 1550nm DFB laser and PIN photodetector for 80km transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- Compatible with SONET OC-24-LR-1
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: Standard: 0 to +70°C Extended: -20 to +85°C

APPLICATIONS

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

1. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|-----------------|------|-----|------|
| Supply Voltage | V _{cc} | -0.5 | 4.5 | V |
| Storage Temperature | T _s | -40 | +85 | °C |
| Operating Humidity | - | 5 | 85 | % |

2. Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------|-----------------|------|---------|------|------|
| Operating Case Temperature | Standard | 0 | | +70 | °C |
| | Extended | -20 | | +85 | °C |
| Power Supply Voltage | V _{cc} | 3.13 | 3.3 | 3.47 | V |
| Power Supply Current | I _{cc} | | | 300 | mA |
| Data Rate | | | 1.25 | | Gbps |

3. Optical and Electrical Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|----------------------------------|------------------|------|---------|-----------------|------|-------|
| Transmitter | | | | | | |
| Centre Wavelength | λ _c | 1480 | 1550 | 1580 | nm | |
| Spectral Width (-20dB) | Δλ | | | 1 | nm | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Average Output Power | P _{out} | 0 | | 5 | dBm | 1 |
| Extinction Ratio | ER | 9 | | | dB | |
| Optical Rise/Fall Time (20%~80%) | tr/tf | | | 0.26 | ns | |
| Data Input Swing Differential | V _{IN} | 400 | | 1800 | mV | 2 |
| Input Differential Impedance | Z _{IN} | 90 | 100 | 110 | Ω | |
| TX Disable | Disable | 2.0 | | V _{cc} | V | |
| | Enable | 0 | | 0.8 | V | |
| TX Fault | Fault | 2.0 | | V _{cc} | V | |
| | Normal | 0 | | 0.8 | V | |
| Receiver | | | | | | |
| Centre Wavelength | λ _c | 1260 | | 1580 | nm | |
| Receiver Sensitivity | | | | -24 | dBm | 3 |
| Receiver Overload | | -3 | | | dBm | 3 |
| LOS De-Assert | LOS _D | | | -26 | dBm | |
| LOS Assert | LOS _A | -30 | | | dBm | |
| LOS Hysteresis | | 1 | | 4 | dB | |
| Data Output Swing Differential | V _{out} | 370 | | 1800 | mV | 4 |
| LOS | High | 2.0 | | V _{cc} | V | |
| | Low | | | 0.8 | V | |

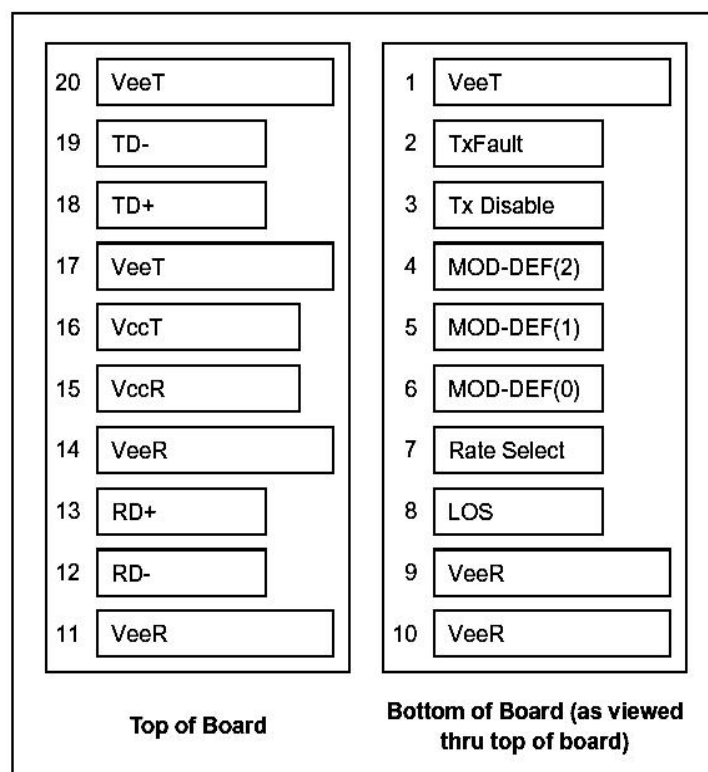
Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2⁷-1 test pattern @1250Mbps, BER ≤1×10⁻¹².
4. Internally AC-coupled.

4. Timing and Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|---|---------------------------|-----|---------|-----------------|------|
| Tx Disable Negate Time | t _{on} | | | 1 | ms |
| Tx Disable Assert Time | t _{off} | | | 10 | μs |
| Time To Initialize, including Reset of Tx Fault | t _{init} | | | 300 | ms |
| Tx Fault Assert Time | t _{fault} | | | 100 | μs |
| Tx Disable To Reset | t _{reset} | 10 | | | μs |
| LOS Assert Time | t _{loss_on} | | | 100 | μs |
| LOS De-assert Time | t _{loss_off} | | | 100 | μs |
| Serial ID Clock Rate | f _{serial_clock} | | | 400 | KHz |
| MOD_DEF (0:2)-High | V _H | 2 | | V _{cc} | V |
| MOD_DEF (0:2)-Low | V _L | | | 0.8 | V |

5. Pin Definitions



Pin Descriptions

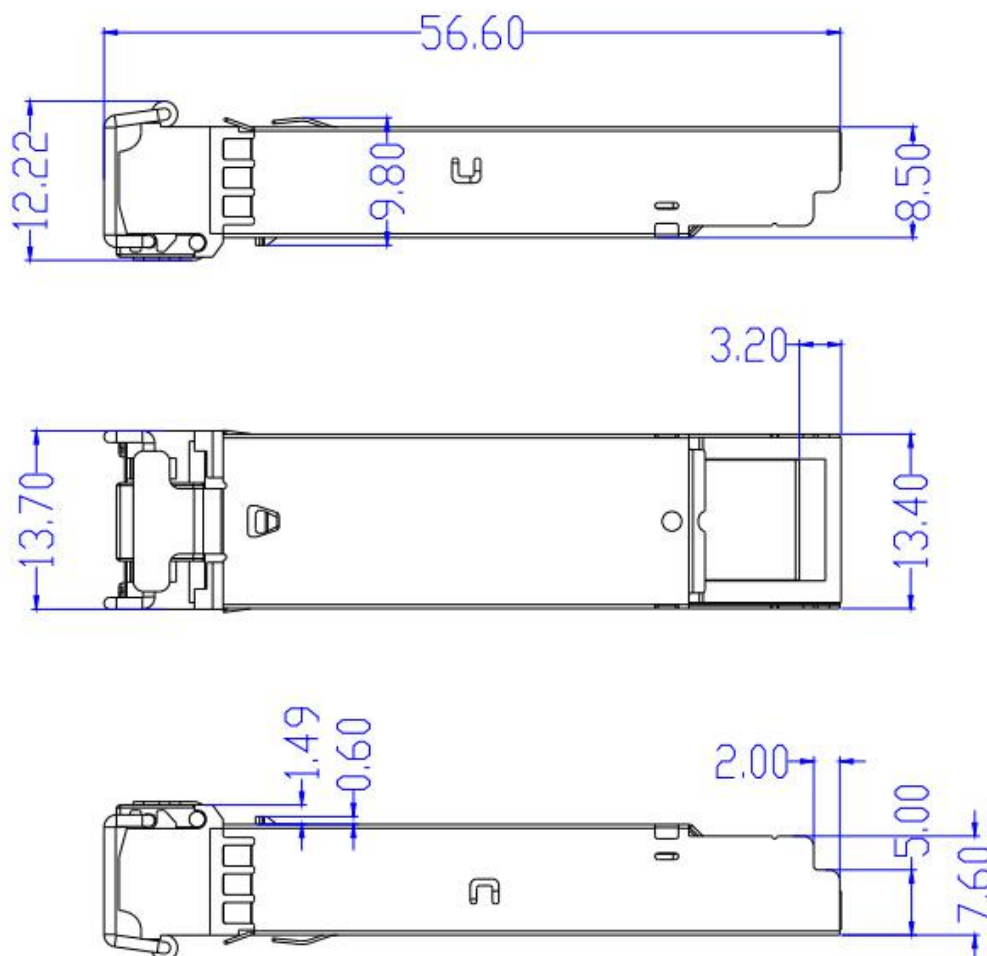
| Pin | Signal Name | Description | Plug Seq. | Notes |
|-----|------------------|------------------------------|-----------|--------|
| 1 | V _{EET} | Transmitter Ground | 1 | |
| 2 | TX FAULT | Transmitter Fault Indication | 3 | Note 1 |
| 3 | TX DISABLE | Transmitter Disable | 3 | Note 2 |
| 4 | MOD_DEF(2) | SDA Serial Data Signal | 3 | Note 3 |
| 5 | MOD_DEF(1) | SCL Serial Clock Signal | 3 | Note 3 |
| 6 | MOD_DEF(0) | TTL Low | 3 | Note 3 |
| 7 | Rate Select | Not Connected | 3 | |
| 8 | LOS | Loss of Signal | 3 | Note 4 |
| 9 | V _{EER} | Receiver ground | 1 | |
| 10 | V _{EER} | Receiver ground | 1 | |
| 11 | V _{EER} | Receiver ground | 1 | |
| 12 | RD- | Inv. Received Data Out | 3 | Note 5 |
| 13 | RD+ | Received Data Out | 3 | Note 5 |
| 14 | V _{EER} | Receiver ground | 1 | |
| 15 | V _{CCR} | Receiver Power Supply | 2 | |
| 16 | V _{CCT} | Transmitter Power Supply | 2 | |
| 17 | V _{EET} | Transmitter Ground | 1 | |
| 18 | TD+ | Transmit Data In | 3 | Note 6 |
| 19 | TD- | Inv. Transmit Data In | 3 | Note 6 |
| 20 | V _{EET} | Transmitter Ground | 1 | |

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and V_{cc}+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
 Low (0 to 0.8V): Transmitter on
 (>0.8V, < 2.0V): Undefined
 High (2.0 to 3.465V): Transmitter Disabled
 Open: Transmitter Disabled
- Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be V_{ccT} or V_{ccR}.
 Mod-Def 0 is grounded by the module to indicate that the module is present
 Mod-Def 1 is the clock line of two wire serial interface for serial ID
 Mod-Def 2 is the data line of two wire serial interface for serial ID
- LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and V_{cc}+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
- RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

6. Mechanical Dimensions



7. Ordering information

| Part Number | Product Description |
|---------------|---|
| QT-SFP-0380D | SFP, 1.25Gb/s, 1550nm, SMF, 80KM, DDM, LC connector, 0°C to +70°C |
| QT-SFP-0380ID | SFP, 1.25Gb/s, 1550nm, SMF, 80KM, DDM, LC connector, -40°C to +85°C |