

1.25Gb/s SFP 850nm 550m Optical Transceiver

Features

- Up to 1.25Gbps data-rate
- Duplex LC receptacle optical interface compliant
- Single +3.3V power supply
- Hot-pluggable
- Receiver Loss of Signal Output
- Serial ID module on MOD[0-2]
- International Class 1 laser safety certified
- 850nm VCSEL laser transmitter
- Operating temperature range:0~+70°Ct
- Up to 550m transmission distance on 50/125 μ m OM3 MMF fiber
- ROHS Compliant

Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch Interface
- Other optical Links

Compliance

- SFP MSA
- SFF-8472
- IEEE802.3z
- RoHS

Description

The SFP-1G-SX series multi-mode transceivers are small form factor pluggable module for bi-directional serial optical data communications such as Gigabit Ethernet 1000BASE-SX and Fiber Channel FC-PH-2 for 100-M5-SN-1 and 100-M6-SN-1. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for multi-mode fiber and operates at a nominal wavelength of 850nm.

The transmitter section uses a Vertical Cavity Surface Emitted Laser (VCSEL) which is a Class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated GaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.*Exceeding any one of these values may destroy the device immediately.

Absolute Maximum Ratings

| Table1-Absolute Maximum Ratings | | | | | | |
|---------------------------------|---------|------|---------|------|------|-------|
| Parameter | Symbols | Min. | Typical | Max. | Unit | Notes |
| Storage Temperature | TS | -40 | | +85 | °C | |
| 3.3V Supply Voltage | VCC | -0.5 | | +4 | V | |

Recommended Operating Conditions

| Table2-Recommended Operating Conditions | | | | | | |
|---|---------|-------|------------|-------|------|-------|
| Parameter | Symbols | Min. | Typical | Max. | Unit | Notes |
| Operating Case Temperature | Tc | 0 | | +70 | °C | |
| 3.3V Supply Voltage | VCC | 3.135 | 3.3 | 3.465 | V | |
| Total Data Rate | | | 1.25/1.063 | | Gbps | |

Electrical Characteristic

Tested under recommended operating conditions, unless otherwise noted

| Table3-Electrical Characteristic | | | | | | |
|-------------------------------------|--------|------|---------|------|------|-------|
| Parameter | Symbol | Min. | Typical | Max. | Unit | Notes |
| Single Ended Data Input Swing | | | | 1100 | mV | |
| Single Ended Data Output Swing | | 300 | | 600 | mV | |
| TX_fault/LOS output (TTL) | VOH | 2.0 | | Vcc | V | |
| | VOL | 0 | | 0.8 | V | |
| TX_disable input (TTL) | VOH | 2.0 | | Vcc | V | |
| | VOL | 0 | | 0.8 | V | |
| Optical transmitter Characteristics | | | | | | |

| | | | | | | |
|---|--|-----|-----|------|-----|---|
| Launch Optical Power | Po | -9 | | -3 | dBm | |
| Center Wavelength | λ_c | 830 | 850 | 860 | nm | |
| Extinction Ratio | ER | 9 | | | dB | 1 |
| Total Jitter*(note2) | TJ | | | 0.47 | UI | 1 |
| Eye Diagram | Complies with IEEE802.3z eye masks when filtered | | | | | 1 |
| Optical receiver Characteristics | | | | | | |
| Center Wavelength | λ_C | 770 | | 870 | nm | |
| Receiver Sensitivity | Pmin | | | -18 | dBm | 2 |
| Receiver Overload | Pmax | -3 | | | dBm | |
| LOS De-assert | LosD | | | -20 | dBm | |
| LOS Assert | LosA | -35 | | | dBm | |

Notes:

[1]Filtered, measured with a PRBS 27-1 test pattern @1.25Gbps

[2]Minimum average optical power measured at BER less than 1E-12, with a 27-1 PRBS and ER=9Db.

Pin Description

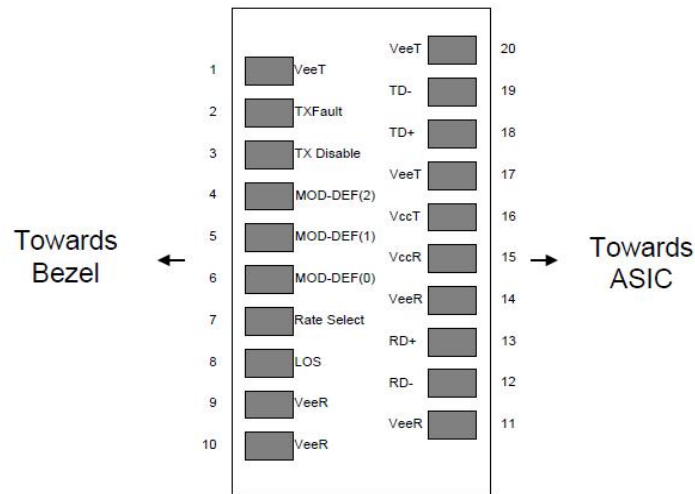


Figure1 Pin view

Pin Function Definitions

| Pin | Name | Description | Notes |
|-----|--------------------|--|-------|
| 1 | V _{EET} | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | T _{FAULT} | Transmitter Fault.Open Drain. Logic "0" indicates normal operation. | 2 |
| 3 | T _{DIS} | Transmitter Disable. Laser output disabled on high or open. | 3 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 4 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 4 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 4 |
| 7 | Rate Select | No connection required. | |
| 8 | LOS | Loss of Signal indication. Open Drain. Logic "0" indicates normal operation. | 5 |
| 9 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 10 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out(CML). AC Coupled | |
| 13 | RD+ | Receiver Non-inverted DATA out(CML). AC Coupled | |
| 14 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | V _{CCR} | Receiver Power Supply | |
| 16 | V _{CCT} | Transmitter Power Supply | |
| 17 | V _{EET} | 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 | V _{EET} | Transmitter Ground (Common with Receiver Ground) | 1 |

Notes:

[1]Circuit ground is internally isolated from chassis ground.

[2]TX Fault is an open drain output, which should be pulled up with 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V to $V_{ccT}/R+0.3V$. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to $<0.8V$. When sensing an improper power level in the laser driver, the SFP sets this signal high and turns off the laser. TX-FAULT can be reset with the TX-DISABLE line. The signal is in LVTTTL level.

[3]TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with 4.7K – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on; ($>0.8, <2.0V$): Undefined; High (2.0V to $V_{ccT}/R+0.3V$): Transmitter Disabled; Open: Transmitter Disabled. The TX-DISABLE signal is high (LVTTTL logic "1") to turn off the laser output. The laser will turn on when TX-DISABLE is low (LVTTTL logic "0").

[4]Should be pulled up with 4.7K - 10KΩ on host board to a voltage between 2.0V to $V_{ccT}/R+0.3V$. MOD_DEF (0) pulls line low to indicate module is plugged in.

[5]LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with 4.7K – 10KΩ resistor. Pull up voltage between 2.0V to $V_{ccT}/R+0.3V$. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to $<0.8V$.

[6]The RX-LOS is high (LVTTTL logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in LVTTTL level.

Mechanical Outline

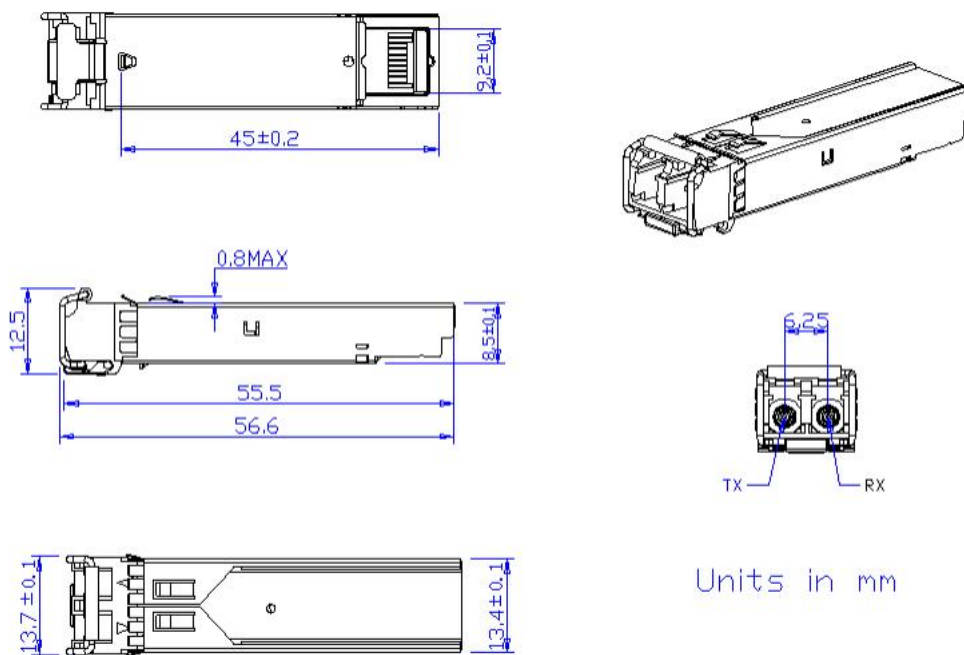


Figure2 Mechanical Outline

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