

PRODUCT FEATURES

- 100% Cisco Compatible GLC-LH-SM
- Up to 1.25 Gb/s data links
- Hot-pluggable SFP form factor
- 1000BASE-LX Gigabit Ethernet
- 1x Fibre Channel
- 1310nm FP laser transmitter
- RoHS compliant and Lead Free
- Up to 10km on 9/125um SMF
- Metal enclosure for lower EMI
- Duplex LC Connector
- Single +3.3V power supply
- Low power dissipation <800mW
- Commercial Temperature Range
- SFP MSA SFF-8074i Compliant



GENERAL

GLC-LH-SM-HPC 1000BASE-LX Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). The Cisco compatible 1000BASE-LX SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.063Gbps and 10km transmission distance over Singlemode Fiber.

REGULATORY COMPLIANCE

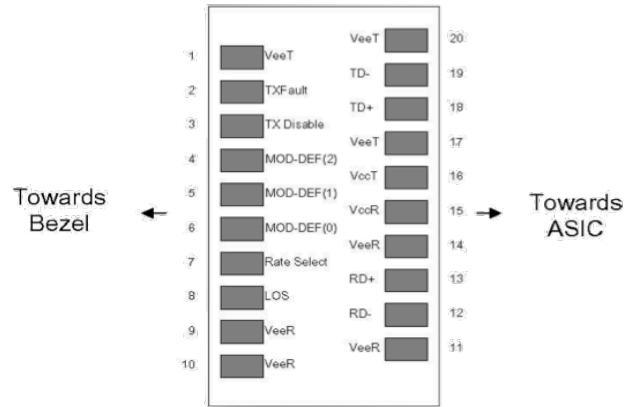
- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Duplex LC Receptacle: compatible with IEC 61000-4-2
- Immunity compatible with IEC 61000-4-3
- EMI compatible with FCC Part 15 Class B EN10k22 Class B (CISPR 22B)
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2
- RoHS compliant with 2002/95/EC 4.1&4.2 2005/747/EC

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 | Transceiver Ground (Common with Transmitter Ground) | 1 |
| 18 | TD+ | Transceiver Non-Inverted DATA in. AC Coupled | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled | |
| 20 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |

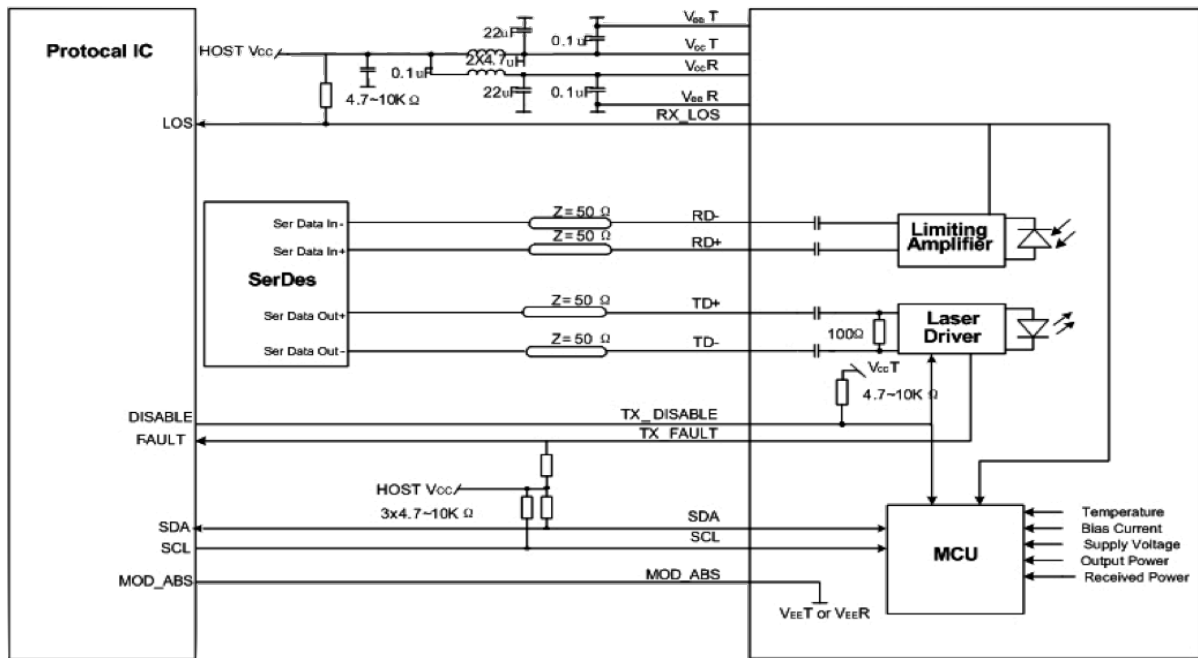
Notes:

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 open collector 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.



Pin-out of Connector Block on Host Board

RECOMMENDED CIRCUIT SCHEMATIC



ABSOLUTE MAXIMUM RATING

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|------------------------|--------|------|-----|------|------|------|
| Maximum Supply Voltage | Vcc | -0.5 | - | +4.0 | V | |
| Storage Temperature | TS | -40 | - | +85 | °C | |
| Operating Humidity | RH | 5 | - | 95 | % | |

RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|------------------------------|--------|------|-------|------|------|------|
| Power Supply Voltage | Vcc | 3.13 | 3.30 | 3.47 | V | |
| Power Supply Current | Icc | - | - | 250 | mA | |
| Case Operating Temperature | Tc | 0 | - | +70 | °C | |
| Data Rate (Gigabit Ethernet) | - | - | 1.25 | - | Gbps | |
| Data Rate (Fibre Channel) | - | - | 1.063 | - | Gbps | |
| 50/125um SMF | Lmax | - | - | 10k | m | |

ELECTRICAL CHARACTERISTICS (TOP=25°C, VCC=3.3Volts)

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|--------------------------------|----------|-----------|-----|-----------|------|------|
| Transmitter | | | | | | |
| Input differential impedance | Rin | - | 100 | - | Ω | 1 |
| Single ended data input swing | Vin, pp | 250 | - | 1200 | mV | |
| TX Disable-High | - | Vcc - 1.3 | - | Vcc | V | |
| TX Disable-Low | - | Vee | - | Vee + 0.8 | V | |
| TX Fault-High | - | Vcc - 0.5 | - | Vcc | V | |
| TX Fault-Low | - | Vee | - | Vee + 0.5 | V | |
| Receiver | | | | | | |
| Single ended data output swing | Vout, pp | 300 | 400 | 800 | mV | 2 |
| Data output rise time | tr | - | - | 175 | ps | 3 |
| Data output fall time | tr | - | - | 175 | ps | 3 |
| LOS-High | - | Vcc - 0.5 | - | Vcc | V | |
| LOS-Low | - | Vee | - | Vee + 0.5 | V | |

Notes:

1. AC Coupled
2. Into 100 ohm differential termination
3. 20% to 80%

OPTICAL CHARACTERISTICS (TOP=25°C, VCC=3.3Volts)

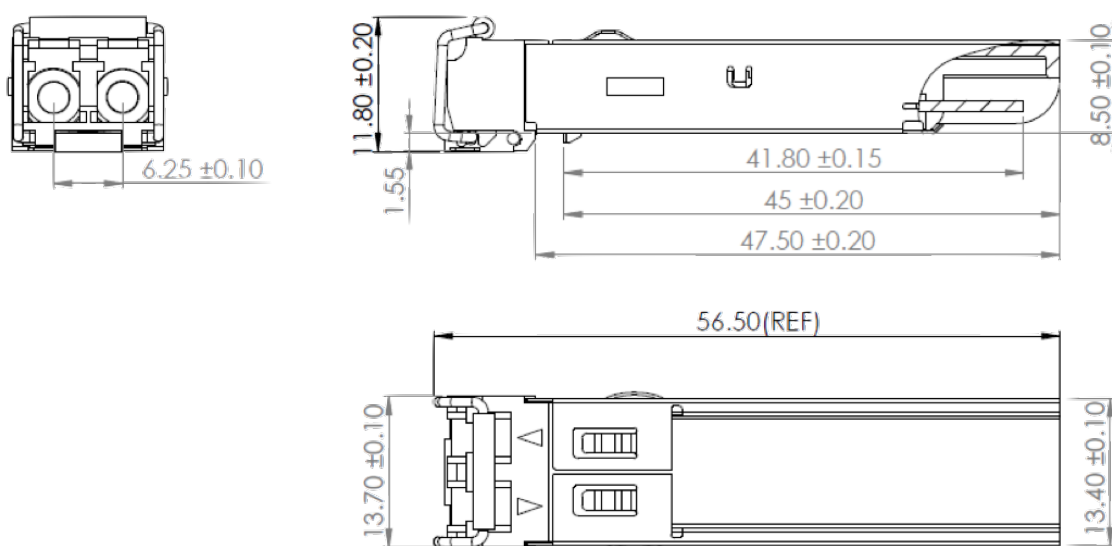
| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|---------------------------|-------------|------|------|------|------|------|
| Transmitter | | | | | | |
| Output Opt. Power | PO | -9 | - | -4 | dBm | 1 |
| Optical Wavelength | λ | 1275 | 1310 | 1350 | nm | |
| Spectral Width | σ | - | - | 3 | nm | |
| Optical Rise/Fall Time | tr/ta | - | - | 260 | ps | 2 |
| Total Jitter | TJ | - | - | 200 | ps | |
| Optical Extinction Ratio | ER | 9 | - | - | dB | |
| Receiver | | | | | | |
| RX Sensitivity @ 1.25Gb/s | RSENS | - | - | -25 | dBm | 3 |
| Maximum Received Power | RXMax | -2 | - | - | dBm | |
| Optical Center Wavelength | λ_C | 1270 | - | 1600 | nm | |
| LOS De-Assert | LOSD | - | - | -26 | dBm | |
| LOS Assert | LOSA | -40 | - | - | dBm | |
| LOS Hysteresis | - | 0.5 | - | 5 | dB | |

Notes:

1. Class 1 Laser Safety
2. Unfiltered, 20-80%. Complies with GE and 1x FC eye masks when filtered,.
3. Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.

MECHANICAL SPECIFICATIONS

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

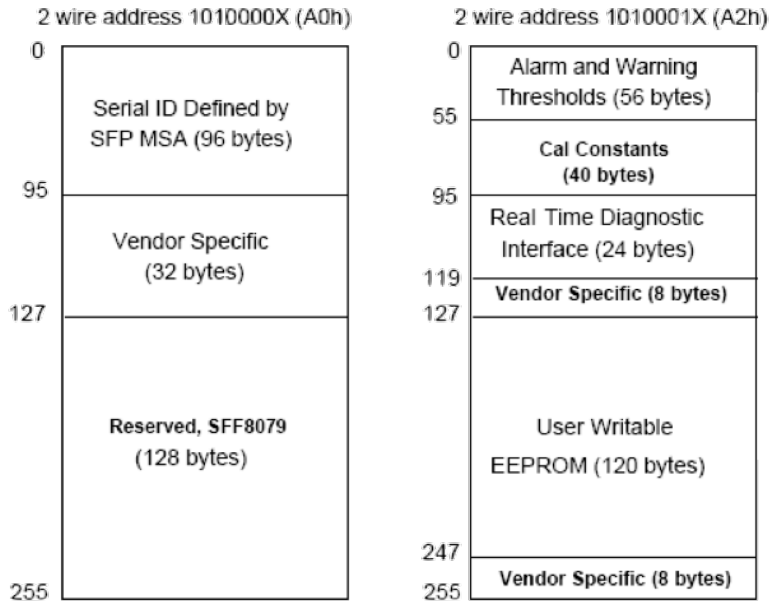


*DIMENSIONS IN MILLIMETERS

GLC-LH-SM-HPC

EEPROM INFORMATION

EEPROM memory map specific data field description is as below:



DIGITAL DIAGNOSTIC MONITORING INTERFACE

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

| Parameter | Range | Accuracy | Calibration |
|--------------|---------------|----------|-------------|
| Temperature | 0°C to 70°C | ±3°C | Internal |
| Voltage | 2.97 to 3.63V | ±3% | Internal |
| Bias Current | 0 to 100mA | ±10% | Internal |
| TX Power | -9 to -3dBm | ±3dB | Internal |
| RX Power | -25 to -2dBm | ±3dB | Internal |

ORDERING INFORMATION

| Part Number | Product Description |
|---------------|--|
| GLC-LH-SM-HPC | Cisco Compatible 1GB LX SMF 1310nm SFP Transceiver |