

FEATURES

- Dual GbE in one C-SFP form factor
- Two single fiber bi-directional data links symmetric 1.25Gbps application
- 1310nm FP transmitter, 1490nm PIN-TIA receiver
- -40 to +85°C operating case temperature
- SFP+ package with duplex LC/PC SMF receptacle connector
- Up to 10km distance
- Hot-pluggable capability
- Single 3.3V power supply
- Built-in Digital Diagnostic monitoring (DDM) function
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant
- RoHS-6 compliance



APPLICATIONS

- CPRI 1.2288Gbps
- Gigabit Ethernet 1.25Gbps
- Switch to switch interface
- Switched backplane applications
- High Speed Interface for server farms

STANDARDS

- Complies with SFP+ MSA (SFF-8431)
- Complies with SFF-8472 Rev 10.4
- Complies with FCC 47 CFR Part 15, Class B
- Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

ABSOLUTE MAXIMUM RATING

| Parameter | Symbol | Min. | Max. | Unit | Notes |
|-----------------------------|------------------|------|------|------|-------|
| Storage Ambient Temperature | T _{STG} | -40 | 85 | °C | |
| Operating Case Temperature | T _C | -40 | 85 | °C | |
| Operating Humidity | OH | 5 | 95 | % | |
| Power Supply Voltage | V _{CC} | 0 | 4 | V | |
| Receiver Damaged Threshold | | +4 | | dBm | |

RECOMMENDED OPERATING CONDITION

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|----------------------------|-----------------|--------|------|------|------|-------|
| Operating Case Temperature | T _C | -40 | | 85 | °C | |
| Power Supply Voltage | V _{CC} | 3.13 | 3.3 | 3.47 | V | |
| Power Supply Current | I _{CC} | | 200 | 300 | mA | |
| Date Rate | | 1.2288 | | 1.25 | Gbps | |
| Data Rate Drift | | -100 | | +100 | PPM | |

TRANSMITTER OPTICAL CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|----------------|------------------------|------|------|-------|----------------------------------|
| Centre Wavelength | λ _C | 1260 | 1310 | 1360 | nm | |
| Spectral Width (RMS) | | | | 3 | nm | |
| Average Output Power | P _O | -9 | | -3 | dBm | |
| Burst off Average Output Power | | | | -45 | dBm | |
| Extinction Ratio | ER | 6 | | | dB | |
| Optical Return Loss Tolerance | | | | 12 | dB | |
| RIN ₁₅ OMA | | | | -115 | dB/Hz | |
| Output Optical Eye | | IEEE Std 802.3ah™-2004 | | | | PRBS 2 ⁷ -1 @1.25Gbps |

TRANSMITTER ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-------------------------------|---------|------|------|------|----------|-----------------------|
| Data Input Differential Swing | | 200 | | 1200 | mV | CML input, AC coupled |
| Input Differential Impedance | | 90 | 100 | 110 | Ω | |
| TX Disable | Disable | 2 | | VCC | V | |
| | Enable | 0 | | 0.8 | V | |
| TX Fault | Normal | 2.4 | | VCC | V | |
| | Fault | 0 | | 0.4 | V | |

RECEIVER OPTICAL CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|-------------|------|------|------|------|---|
| Operating Wavelength | λ_c | 1480 | 1490 | 1500 | nm | |
| Sensitivity (OMA) | SEN | | | -22 | dBm | PRBS 2 ⁷ -1 BER \leq 10E-12, ER=9dB |
| Saturation Optical Power | SAT | -3 | | | dBm | |
| Loss of Signal De-Assert Level | LOSD | | | -22 | dBm | |
| Loss of Signal Assert Level | LOSA | -45 | | | dBm | |
| Loss of Signal Hysteresis | | 0.5 | | | dBm | |

RECEIVER ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|--------|------|------|-----------------|------|------------------------|
| Data Output Differential Swing | | 200 | | 1200 | mV | CML output, AC coupled |
| Loss of Signal - Low | | 0 | | 0.4 | V | |
| Loss of Signal - High | | 2.4 | | V _{CC} | V | |

| PIN DESCRIPTION | | | |
|-----------------|-------------------|------------------------------------|---|
| PIN | Name | Description | Notes |
| 1 | V _{EE} | Transceiver Ground | |
| 2 | TX_Fault | Transmitter Fault Indication | |
| 3 | TX_Disable1 | Transmitter Disable of channel1 | Low: transmitter on; High: transmitter off |
| 4 | SDA | SDA | The data line of two wire serial interface |
| 5 | SCL | SCL | The clock line of two wire serial interface |
| 6 | TD-2 | Inv. Transmit Data In of channel2 | AC-coupled, CML |
| 7 | TD+2 | Transmit Data In of channel2 | AC-coupled, CML |
| 8 | LOS1 | Loss of signal for channel1 | |
| 9 | RD+2 | Received Data Out of channel2 | AC-coupled, CML |
| 10 | RD-2 | Inv. Received Data Out of channel2 | AC-coupled, CML |
| 11 | V _{EE} | Transceiver Ground | |
| 12 | RD-1 | Inv. Received Data Out of channel1 | AC-coupled, CML |
| 13 | RD+1 | Received Data Out of channel1 | AC-coupled, CML |
| 14 | LOS2 | Loss of signal for channel2 | |
| 15 | V _{CC} R | Receiver Power | |
| 16 | V _{CC} T | Transmitter Power | |
| 17 | TX_Disable2 | Transmitter Disable of channe2 | Low: transmitter on; High: transmitter off |
| 18 | TD+1 | Transmit Data In of channel1 | AC-coupled, CML |
| 19 | TD-1 | Inv. Transmit Data In of channel1 | AC-coupled, CML |
| 20 | V _{EE} | Transceiver Ground | |

PIN OUT DRAWING (TOP VIEW)

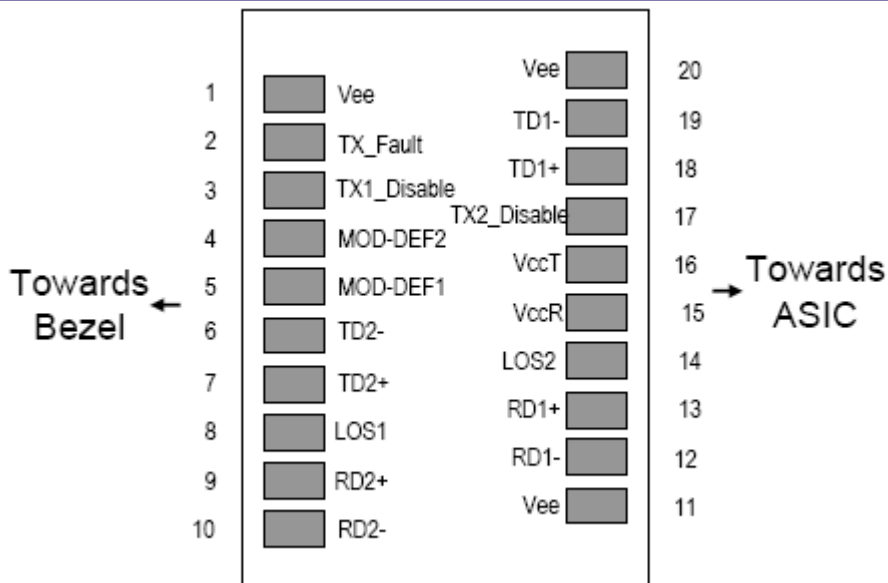


Figure 1 Pin Out Drawing

TYPICAL INTERFACE CIRCUIT

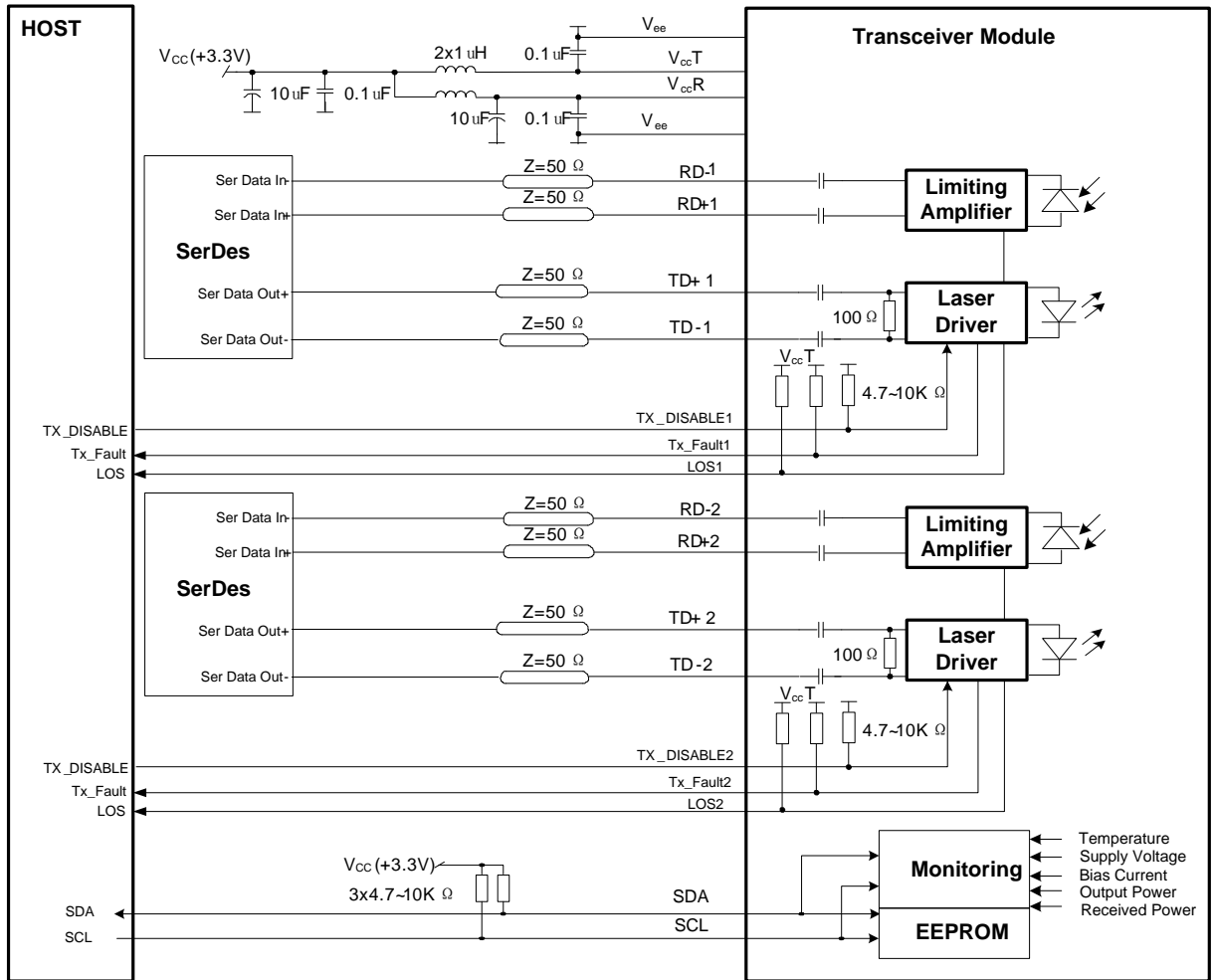


Figure 2 Typical Interface Circuit

SFP RECOMMENDED HOST BOARD POWER SUPPLY FILTERING NETWORK

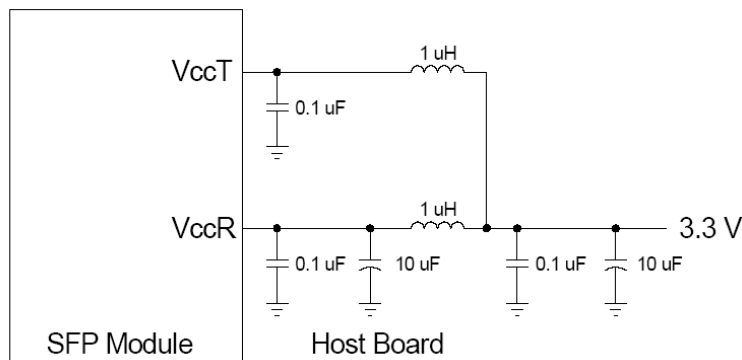
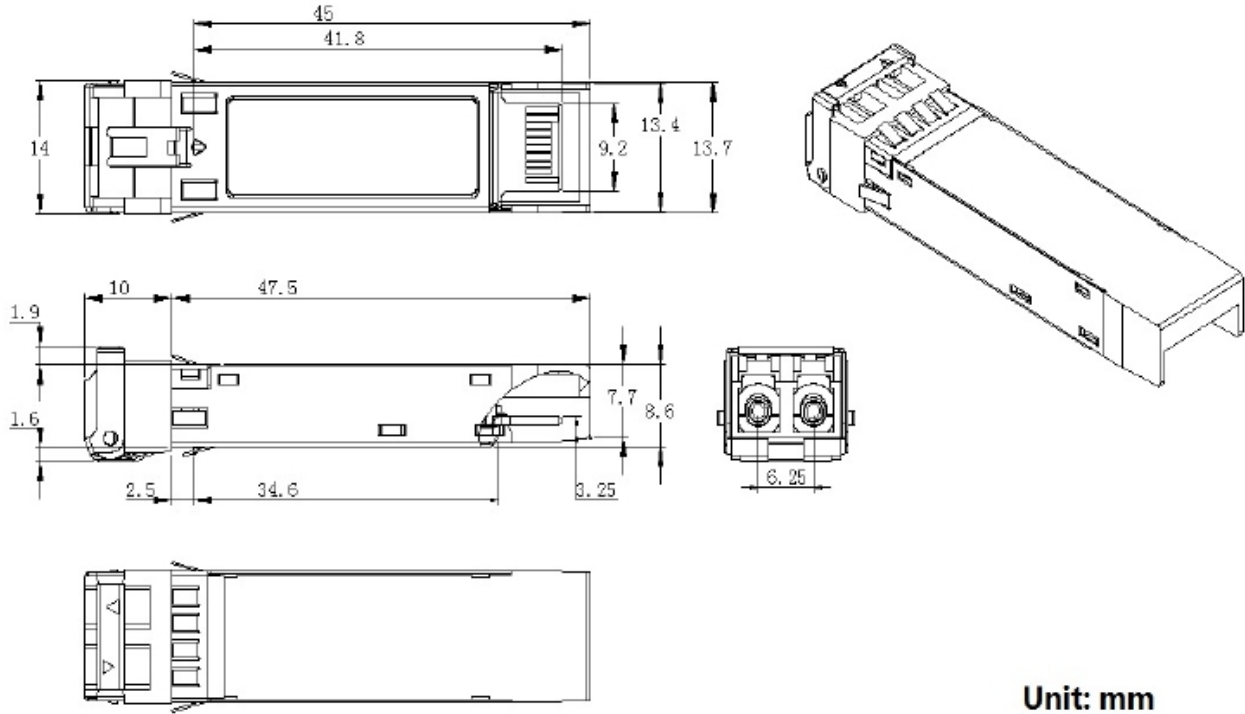


Figure 3 SFP Recommended Host Board Power Supply Filtering Network

PACKAGE OUTLINE



Unit: mm

Figure 4 Package Outline

EEPROM INFORMATION

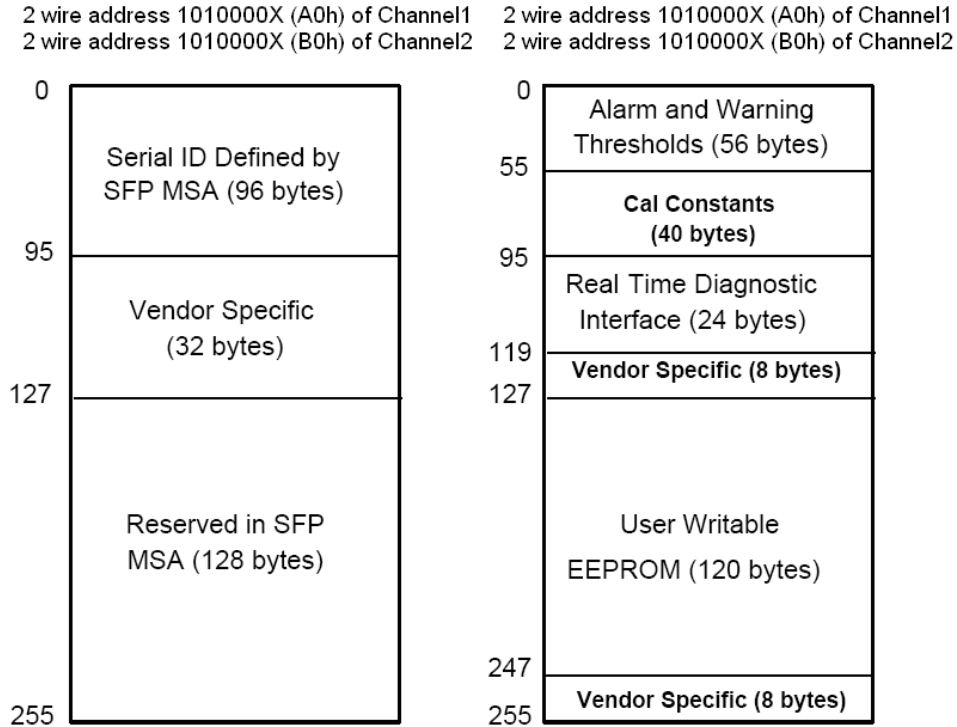


Figure 5 EEPROM Memory Map Specific Data Field Descriptions

DIGITAL DIAGNOSTIC MONITORING INTERFACE

| Parameter | Range | Accuracy | Calibration | NOTES |
|--------------|---------------|----------|-------------|-------------|
| Temperature | -40 to 85°C | ±3°C | Internal | LSB: 1/256C |
| Voltage | 2.97 to 3.63V | ±3% | Internal | LSB: 0.1mV |
| Bias Current | 0 to 100mA | ±10% | Internal | LSB: 2uA |
| TX Power | -8 to -2dBm | ±3dB | Internal | LSB: 0.1uW |
| RX Power | -21 to -2dBm | ±3dB | Internal | LSB: 0.1uW |

WARNINGS

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.