

1.25Gb/s Single Fiber BIDI SFP Optical Transceiver

Applications

- Applied to optical fiber access Giga Ethernet and Fiber Channel with bit rate up to 1.25Gb/s

Features

- Single Fiber Bi-Directional SM SFP Transceiver
- Single-mode and Multi-mode
- Up to 1.25Gb/s data rate
- Module integrates receive and transmit circuits of two parts
- All-metal shell and the shell with plastic end plug form, LC or SC receptacle.
- Hot-pluggable
- Metropolitan area network
- Single +3.3V power supply
- Standard PECL data output and input with signal detect indication
- High quality 1310nm MQW-FP LD and 1550nm FP LD\ 1490nm DFB LD\ 1550nm DFB LD
- Commercial level and Industrial level products for customers
- Compliant with SFP MSA
- ROHS compliance



Specifications

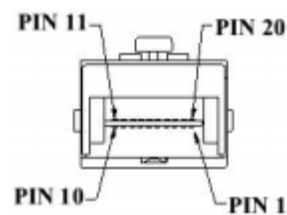
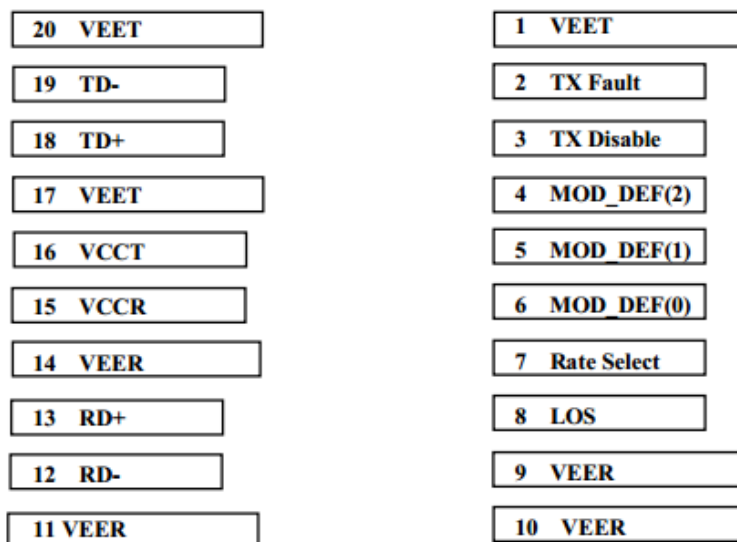
| Absolute Maximum Ratings | | | | | | |
|---|-------------------|--------|------|--------|------|------------------|
| Parameters | Symbol | Min | Type | Max | unit | |
| Storage temperature (°C) | T _s | -40 | | +85 | °C | |
| Supply voltage(V) | V _{cc} | -0.5 | | 3.63 | V | |
| Relative Humidity | R _H | 5 | | 95 | % | |
| Recommended Operating Conditions | | | | | | |
| Case Operating Temperature Range (°C) | T _c | -40 | | +85 | °C | Industrial level |
| | T _c | 0 | | 70 | °C | Commercial level |
| Supply voltage(V) | V _{cc} | +3.135 | +3.3 | +3.465 | V | |
| Data rate | | | 1.25 | | Gb/s | |
| Transceiver Electrical Characteristics Top=23°C@3.3v supply voltage | | | | | | |
| Module Supply Current | I _{cc} | | | 250 | mA | |
| Inrush Current | I _{RUSH} | | | 30 | mA | |
| Input differential impedance | R _{in} | | 100 | | Ω | |
| Transmitter Single Ended Input Voltage (TD±) | V _{in} | 100 | | 1200 | mV | |
| Transmit Fault(TX_Fault) | V _{OH} | 2.0 | | 3.3 | V | |
| LOSS of Signal (LOS) | V _{OL} | 0 | | 0.8 | V | |

| Parameters | Symbol | Min | Typ | Max | Unit | Remark |
|---|---|------|------|------|------|------------------------------------|
| Transmit Disable Input Low | V_{IL} | 0 | | 0.8 | V | |
| Transmit Disable Input High | V_{IH} | 2.4 | | 3.3 | V | |
| Receiver Single Ended Output Voltage (RD±) | V_{out} | 200 | | 800 | mV | |
| Optical transmitter Characteristics Top=23°C@3.3v supply voltage | | | | | | |
| Center Wavelength | $\lambda@1310$ | 1260 | 1310 | 1360 | nm | FP |
| | $\lambda@1550$ | 1530 | 1550 | 1570 | nm | FP |
| | $\lambda@1550$ | 1540 | 1550 | 1560 | nm | DFB |
| | $\lambda@1490$ | 1480 | 1490 | 1500 | nm | DFB |
| Optical Power | $P_0@1310$ | -12 | | | dBm | |
| | $P_0@1550$ | -12 | | | dBm | |
| Optical Rise Time | T_r | | 120 | 150 | ps | |
| Optical Fall Time | T_f | | 120 | 150 | ps | |
| Extinction Ratio | Ext | 8.2 | | | dB | |
| Spectral Width (-20dB) | $\Delta\lambda$ | | | 4 | nm | FP-LD,RMS |
| | $\Delta\lambda$ | | | 1 | nm | DFB-LD,-20dB |
| Eye Mask | Compliant with Eye Mask Defined in IEEE 802.3 | | | | | |
| Optical receiver Characteristics Top=23°C@3.3v supply voltage | | | | | | |
| Center Wavelength | λ | 1100 | | 1650 | nm | |
| Receive Optical Sensitivity | Sen | | | -24 | dBm | |
| LOS output (TTL high level) | V_{LOS} | 2 | | | V | |
| Receiver Overload | P_{inMAX} | -3 | | | dBm | |
| LOS Assert | P_{LOS_A} | -32 | | | dBm | |
| LOS Deassert | P_{LOS_D} | | | -28 | dBm | |
| LOS Hysteresis | P_H | 0.5 | 2 | 4 | dB | $10\log(V_{DE-ASSERT}/V_{ASSERT})$ |

Data rate\LD Wavelength and Mode\Optical output power\Sensitivity\Reach

| Data rate | LD | Wavelength (nm) mode | Optical output power P0 (dBm) | Sensitivity (dBm) | Reach (km) |
|-----------|----------|----------------------|-------------------------------|-------------------|------------|
| 1.25Gb/s | 1310 FP | SM 1310 | ≥-10 | ≤-24 | 20km |
| | 1550 DFB | SM 1550 | ≥-10 | ≤-24 | |
| | 1310 FP | SM 1310 | ≥-4 | ≤-25 | 40km |
| | 1550 DFB | SM 1550 | ≥-10 | ≤-25 | |
| | 1490 DFB | SM 1490 | ≥-6 | ≤-26 | 60km |
| | 1550 DFB | SM 1550 | ≥-6 | ≤-26 | |
| | 1490 DFB | SM 1490 | ≥-1 | ≤-27 | 80km |
| | 1550 DFB | SM 1550 | ≥-1 | ≤-27 | |
| | 1310 FP | MM 1310 | ≥-12 | ≤-24 | 2km |
| | 1550 FP | MM 1550 | ≥-12 | ≤-24 | |

Pin Arrangement



Pin Definitions

| Pin | Name | Function/Description |
|-----|-------------|---|
| 1 | VeeT | Transmitter Ground |
| 2 | TX Fault | Transmitter Fault Indication |
| 3 | TX Disable | Transmitter Disable-Module disables on high or open |
| 4 | MOD-DEF2 | Module Definition 2-Two wire serial ID interface |
| 5 | MOD-DEF1 | Module Definition 1-Two wire serial ID interface |
| 6 | MOD-DEF0 | Module Definition 0-Two wire serial ID interface |
| 7 | Rate Select | Not Connected |
| 8 | LOS | Loss of Signal |
| 9 | VeeR | Receiver Ground |
| 10 | VeeR | Receiver Ground |
| 11 | VeeR | Receiver Ground |
| 12 | RD- | Inverse Received Data out |
| 13 | RD+ | Received Data out |
| 14 | VeeR | Receiver Ground |
| 15 | VccR | Receiver Power --- +3.3V |
| 16 | VccT | Transmitter Power --- +3.3 V |
| 17 | VeeT | Transmitter Ground |
| 18 | TD+ | Transmitter Data In |
| 19 | TD- | Inverse Transmitter Data In |
| 20 | VeeT | Transmitter Ground |

Digital Diagnostic Memory Map

2 wire address 1010000X (A0)

| | |
|-----|--|
| 0 | Serial ID Defined by SPF MSA(96bytes) |
| 95 | |
| 127 | |
| | Vendor Specific (32bytes) |
| | Reserved in SFP MSA (128bytes) |
| 255 | |

2 wire address 1010001X (A2)

| | |
|-----|---|
| 0 | Alarm and Warning Thresholds (56 bytes) |
| 55 | |
| | Cal Constants (40 bytes) |
| 95 | Real-Time DiagnosticInterface (24 bytes) |
| 119 | |
| | Vendor Specific (8bytes) |
| 127 | User Writable EEPROM (120bytes) |
| 247 | |
| | Vendor Specific (8bytes) |
| 255 | |

EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0). Memory Contents of Serial ID are shown in Table 2.

Table 2 Serial ID Memory Contents

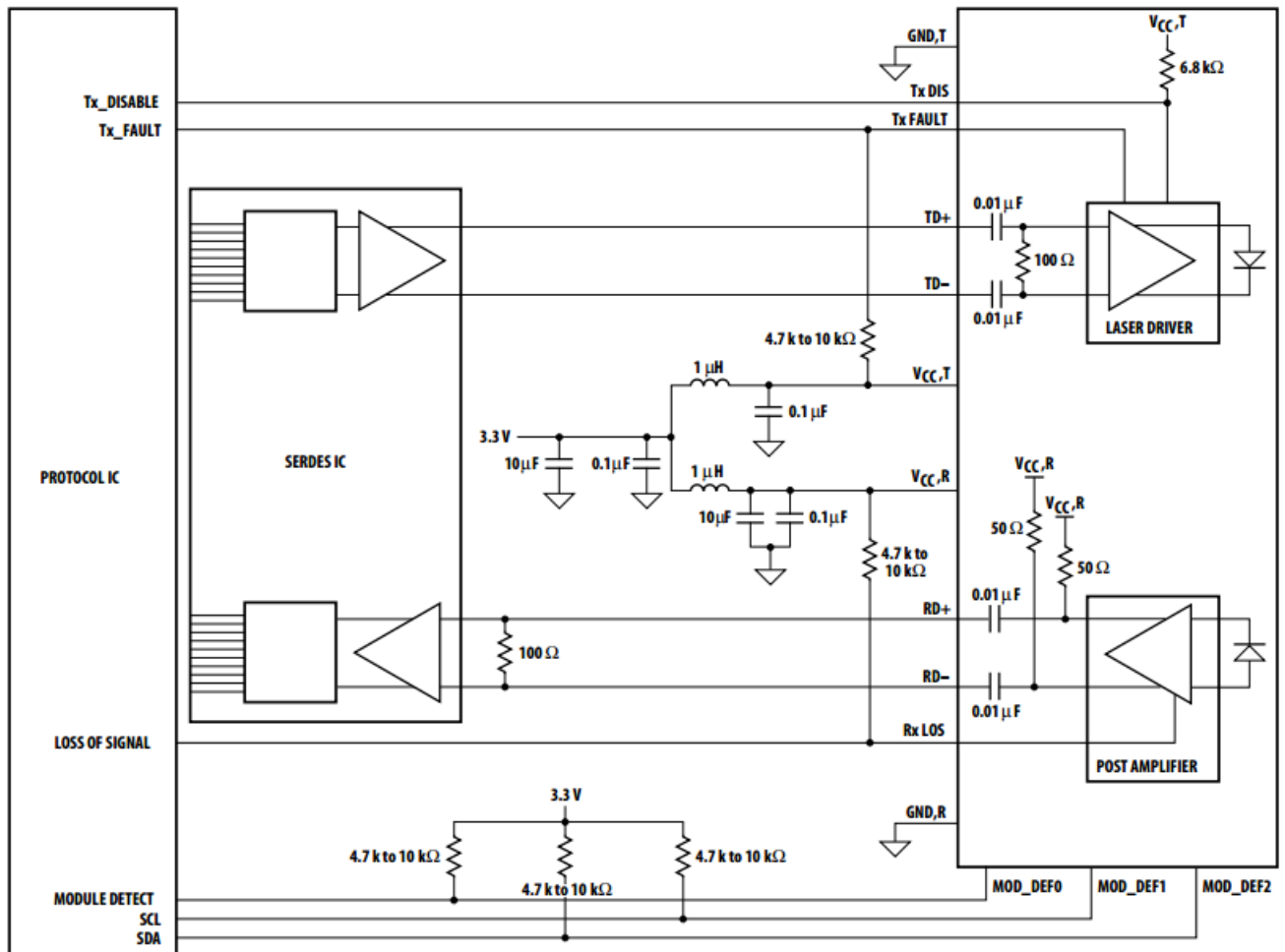
| Data Address | Size (Bytes) | Name of Field | Contents (Hex) | Description |
|---------------------------|--------------|---------------------|--|--|
| 0 | 1 | Identifier | 03 | SFP |
| 1 | 1 | Ext.Identifier | 04 | SFP function is defined by serial ID only |
| 2 | 1 | Connector | 07 | LC Connector |
| 3-10 | 8 | Transceiver | | Transceiver Codes |
| 11 | 1 | Encoding | 03 | NRZ |
| 12 | 1 | BR, Nominal | 0D | 1.25Gbit/s |
| 13 | 1 | Reserved | 00 | |
| 14 | 1 | Length (9μm) km | | Transceiver transmit distance |
| 15 | 1 | Length (9μm) 100m | | |
| 16 | 1 | Length (50μm) 10m | | |
| 17 | 1 | Length (62.5μm) 10m | | |
| 18 | 1 | Length (Copper) | 00 | Not compliant |
| 19 | 1 | Reserved | 00 | |
| 20-35 | 16 | Vendor name | 41 2d 43 72 65 61 74 65 20 20 20 20 20 20 20 20 | A-Create (ASCII) |
| 36 | 1 | Reserved | 00 | |
| 37-39 | 3 | Vendor OUI | 00 00 00 | |
| 40-55 | 16 | Vendor PN | | Transceiver part number |
| 56-59 | 4 | Vendor rev | 20 20 20 | |
| 60-61 | 2 | Wavelength | | Transceiver wavelength |
| 62 | 1 | Reserved | 00 | |
| 63 | 1 | CC_BASE | Check Sum (Variable) | Check code for Base ID Fields |
| EXTENDED ID FIELDS | | | | |
| 64-65 | 2 | Options | 00 1A | TX_DISABLE, TX_FAULT and Loss of Signal implemented |
| 66 | 1 | BR,max | 00 | |
| 67 | 1 | BR,min | 00 | |
| 68-83 | 16 | Vendor SN | 31 30 30 39 30 32 32 30 30 30 20 20 20 20 20 20 | Serial Number of transceiver (ASCII). For example "1009022000" |
| 84-91 | 8 | Date code | 30 39 31 30 30 35 20 20 | Manufactory date code. For example "091005" |

| | | | | |
|----------------------------------|-----|----------------------------|----------------------|---|
| 92 | 1 | Diagnostic Monitoring Type | 58 | Digital diagnostic monitoring implemented, "externally calibrated" is implemented, Rx measurement type is "Average Power" |
| 93 | 1 | Enhanced Options | B0 | Optional Alarm/warning flags implemented for all monitored quantities, Optional soft TX_FAULT monitoring implemented, Optional soft RX_LOS monitoring implemented |
| 94 | 1 | SFF-8472 Compliance | | Includes which revision of SFF-8472 the transceiver complies with |
| 95 | 1 | CC_EXT | Chect Sum (Variable) | Check sum for Extended ID Field |
| VENDOR SPECIFIC ID FIELDS | | | | |
| 96-127 | 32 | Vendor Specific | Read only | Depends on customer information |
| 128-255 | 128 | Reserved | Read only | Filled by zero |

Diagnostic Monitor Functions

| Parameter | Unit | Accuracy |
|------------------|------|----------|
| Temperature | °C | ±3 |
| Supply Voltage | V | ±0.1 |
| Tx Bias Current | mA | ±10% |
| Tx Optical Power | dB | ±3 |
| Rx Optical Power | dB | ±3 |

SFP Recommended Application Configuration



Order Information

