
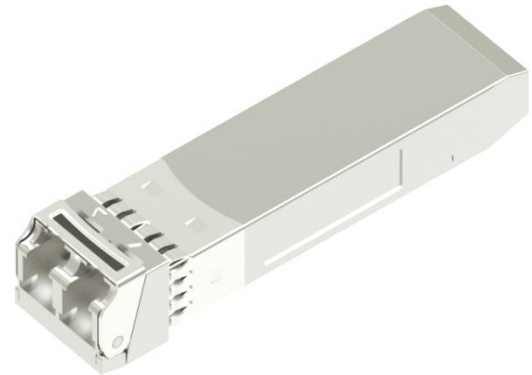


32GFC SFP28 eSW 850nm 300m Optical Transceiver Module

GSS-MPO280-eSRC

Features

- ✓ Hot-pluggable SFP28 form factor
- ✓ Supports 28.05Gbps data rate
- ✓ Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF without FEC or 300m OM4 MMF with FEC
- ✓ 850nm VCSEL laser and PIN photo-detector
- ✓ Internal CDR on both Transmitter and Receiver channel
- ✓ Duplex LC receptacle
- ✓ Single 3.3V power supply
- ✓ Power dissipation < 1W
- ✓ Digital diagnostics functions are available via the I2C interface
- ✓ RoHS 2.0 compliant 
- ✓ Commercial case temperature range: 0°C to 70°C



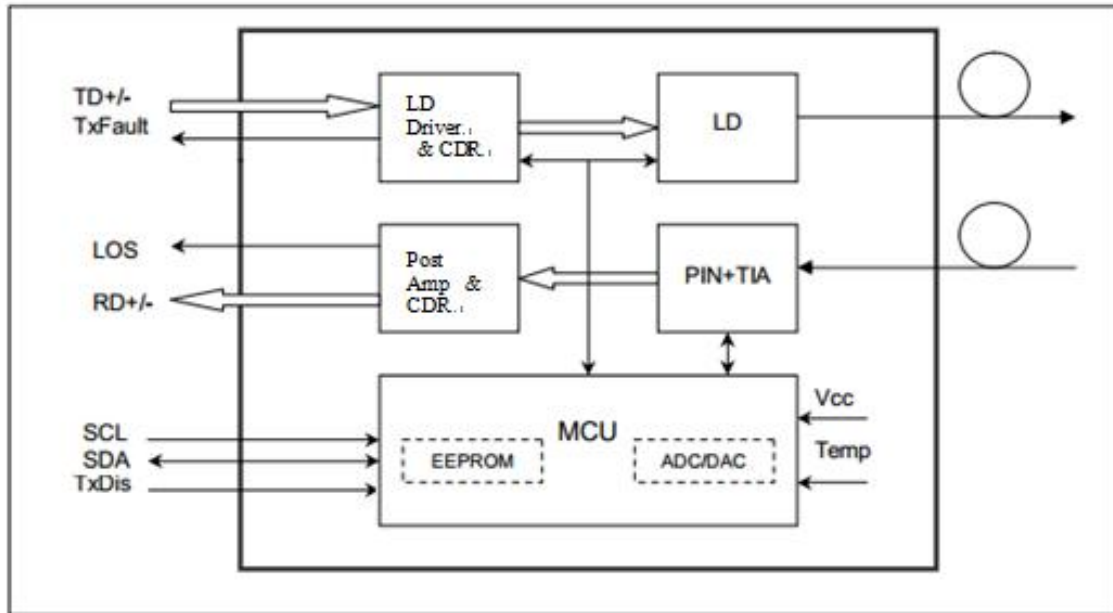
Applications

- ✓ 32G Fiber Channel/OTU4

Description

The Gigalight Technologies GSS-MPO280-eSRC is a single-Channel, Pluggable, Fiber-Optic SFP28 for 28.05Gbps Fiber Channel/OTU4 SFP28 SR Applications. It is a high performance module for short-range data communication and interconnect applications which operate at 28.05Gbps(32GFC) up to 70 m using OM3 fiber and 100m using without KR-FEC, and 300m using with FEC. This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 20contact edge type connector. The optical interface uses duplex LC receptacle. This module incorporates Gigalight Technologies proven circuit and VCSEL technology to provide reliable long life, high performance, and consistent service.

Block Diagram



Absolute Maximum Ratings

Table1 - Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|--------|-----|-----|------|
| Supply Voltage | Vcc | 0 | 3.6 | V |
| Storage Temperature | Ts | -40 | +85 | °C |
| Operating Humidity | - | 5 | 85 | % |

Recommended Operating Conditions

Table2 - Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Unit |
|---|--------|------|---------|------|------|
| Operating Case Temperature | Tc | 0 | | 70 | °C |
| Power Supply Voltage | Vcc | 3.13 | 3.3 | 3.47 | V |
| Power Supply Current | Icc | | | 300 | mA |
| Fiber Length on 50/125µm high-bandwidth (OM4) MMF | | | | 100 | m |

Optical and Electrical Characteristics
Table 3 - Optical and Electrical Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|-------------------------|------|---------|-----------------|-----------------|-------|
| Transmitter | | | | | | |
| Data rate | BR | | 28.05 | | Gbps | |
| Centre Wavelength | λ_c | 840 | 850 | 860 | nm | |
| Spectral Width (-20dB) | σ | | | 0.6 | nm | |
| Average Output Power | P _{avg} | -8.4 | | 2.4 | dBm | |
| Optical Power OMA | P _{OMA} | -6.4 | | 3 | dBm | |
| Extinction Ratio | ER | 2 | | | dB | |
| Differential data input swing | V _{IN,PP} | 40 | | 1000 | mV | |
| 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 | | | | | | |
| Data rate | BR | | 28.05 | | Gbps | |
| Centre Wavelength | λ_c | 840 | 850 | 860 | nm | |
| Receiver Sensitivity (OMA) | P _{sens} | - | - | -10 | dBm | |
| Receiver sensitivity in OMA (32GFC,28.05Gbps.) | | | | -5.2 | dBm | 1 |
| Receiver sensitivity in OMA (OTU4,27.95Gbps.) | | | | -5.2 | dBm | 2 |
| Receiver Power (OMA) | | | | 3 | dBm | |
| LOS De-Assert | LOS _D | | | -13 | dBm | |
| LOS Assert | LOS _A | -30 | | | dBm | |
| LOS Hysteresis | | 0.5 | | | dB | |
| Differential data output swing | V _{out,P} P | 300 | | 850 | mV | |
| LOS | High | 2.0 | | V _{cc} | V | |
| | Low | | | 0.8 | V | |

Notes:

1. Measured with conformance test signal at TP3 for BER=1E-12@32GFC,28.05Gbps.
2. Measured with conformance test signal at TP3 for BER=1E-12@OTU4,27.95Gbps.

Timing and Electrical

Table 4 - Timing and Electrical

| <i>Parameter</i> | <i>Symbol</i> | <i>Min.</i> | <i>Max.</i> | <i>Unit</i> | <i>Conditions</i> |
|---|-----------------------|-------------|-------------|-------------|--|
| Tx_Disable assert time | t_off | | 100 | μs | Rising edge of Tx_Disable to fall of output signal below 10% of nominal |
| Tx_Disable negate time | t_on | | 2 | ms | Falling edge of Tx_Disable to rise of output signal above 90% of nominal. This only applies in normal operation, not during start up or fault recovery. |
| Time to initialize 2-wire interface | t_2w_start_up | | 300 | ms | From power on or hot plug after the supply meeting Table 8. |
| Time to initialize | t_start_up | | 300 | ms | From power supplies meeting Table 8 or hot plug or Tx disable negated during power up, or Tx_Fault recovery, until non-cooled power level I part (or non-cooled power level II part already enabled at power level II for Tx_Fault recovery) is fully operational. |
| Time to initialize cooled module and time to power up a cooled module to Power Level II | t_start_up_cooled | | 90 | s | From power supplies meeting Table 8 or hot plug, or Tx disable negated during power up or Tx_Fault recovery, until cooled power level I part (or cooled power level II part during fault recovery) is fully operational. Also, from stop bit low-to-high SDA transition enabling Power Level II until cooled module is fully operational |
| Time to Power Up to Level II | t_power_level2 | | 300 | ms | From stop bit low-to-high SDA transition enabling power level II until non-cooled module is fully operational |
| Time to Power Down from Level II | t_power_down | | 300 | ms | From stop bit low-to-high SDA transition disabling power level II until module is within power level I requirements |
| Tx_Fault assert | Tx_Fault_on | | 1 | ms | From occurrence of fault to assertion of Tx_Fault |
| Tx_Fault assert for cooled module | Tx_Fault_on_cooled | | 50 | ms | From occurrence of fault to assertion of Tx_Fault |
| Tx_Fault Reset | t_reset | 10 | | μs | Time Tx_Disable must be held high to reset Tx_Fault |
| RS0, RS1 rate select timing for FC | t_RS0_FC, t_RS1_FC | | 500 | μs | From assertion till stable output |
| RS0, RS1 rate select timing non FC | t_RS0, t_RS1 | | 24 | ms | From assertion till stable output |
| Rx_LOS assert delay | t_los_on | | 100 | μs | From occurrence of loss of signal to assertion of Rx_LOS |
| Rx_LOS negate delay | t_los_off | | 100 | μs | From occurrence of presence of signal to negation of Rx_LOS |

Diagnostics

Table5 – DiagnosticsSpecification

| Parameter | Range | Unit | Accuracy | Calibration |
|--------------|------------|------|----------|---------------------|
| Temperature | 0 to +70 | °C | ±3°C | Internal / External |
| Voltage | 3.0 to 3.6 | V | ±3% | Internal / External |
| Bias Current | 0 to 20 | mA | ±10% | Internal / External |
| TX Power | -8 to 3 | dBm | ±3dB | Internal / External |
| RX Power | -14 to 0 | dBm | ±3dB | Internal / External |

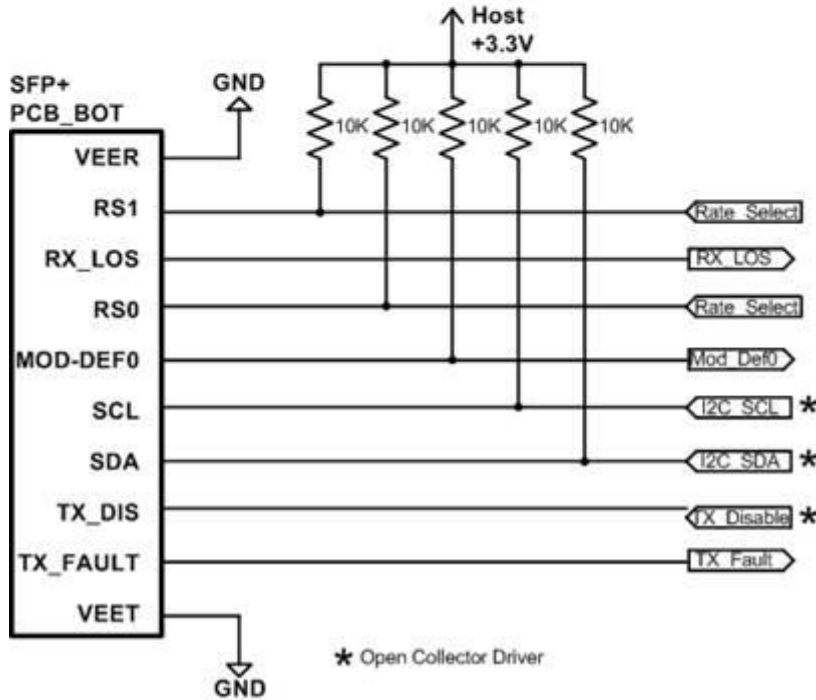
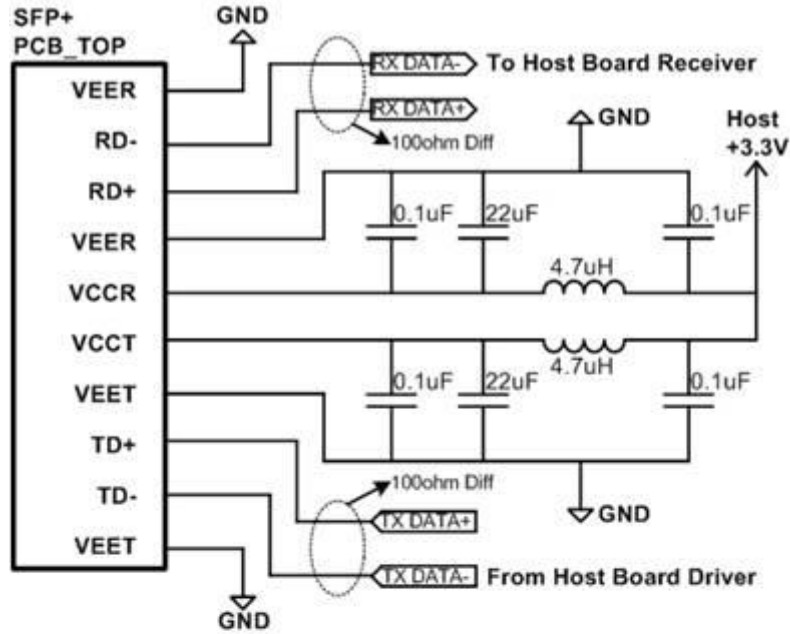
Digital Diagnostic Memory Map

| PIN | Logic | Symbol | Name / Description | Note |
|-----|-----------|----------|---|------|
| 1 | | VeeT | Module Transmitter Ground | 1 |
| 2 | LVTTL-O | TX_Fault | Module Transmitter Fault | 2 |
| 3 | LVTTL-I | TX_Dis | Transmitter Disable; Turns off transmitter laser output | |
| 4 | LVTTL-I/O | SDA | 2-Wire Serial Interface Data Line | 2 |
| 5 | LVTTL-I | SCL | 2-Wire Serial Interface Clock | 2 |
| 6 | | MOD_ABS | Module Definition, Grounded in the module | |
| 7 | LVTTL-I | RS0 | Receiver Rate Select | |
| 8 | LVTTL-O | RX_LOS | Receiver Loss of Signal Indication Active LOW | |
| 9 | LVTTL-I | RS1 | Transmitter Rate Select (not used) | |
| 10 | | VeeR | Module Receiver Ground | 1 |
| 11 | | VeeR | Module Receiver Ground | 1 |
| 12 | CML-O | RD- | Receiver Inverted Data Output | |
| 13 | CML-O | RD+ | Receiver Data Output | |
| 14 | | VeeR | Module Receiver Ground | 1 |
| 15 | | VccR | Module Receiver 3.3 V Supply | |
| 16 | | VccT | Module Receiver 3.3 V Supply | |
| 17 | | VeeT | Module Transmitter Ground | 1 |
| 18 | CML-I | TD+ | Transmitter Non-Inverted Data Input | |
| 19 | CML-I | TD- | Transmitter Inverted Data Input | |
| 20 | | VeeT | Module Transmitter Ground | 1 |

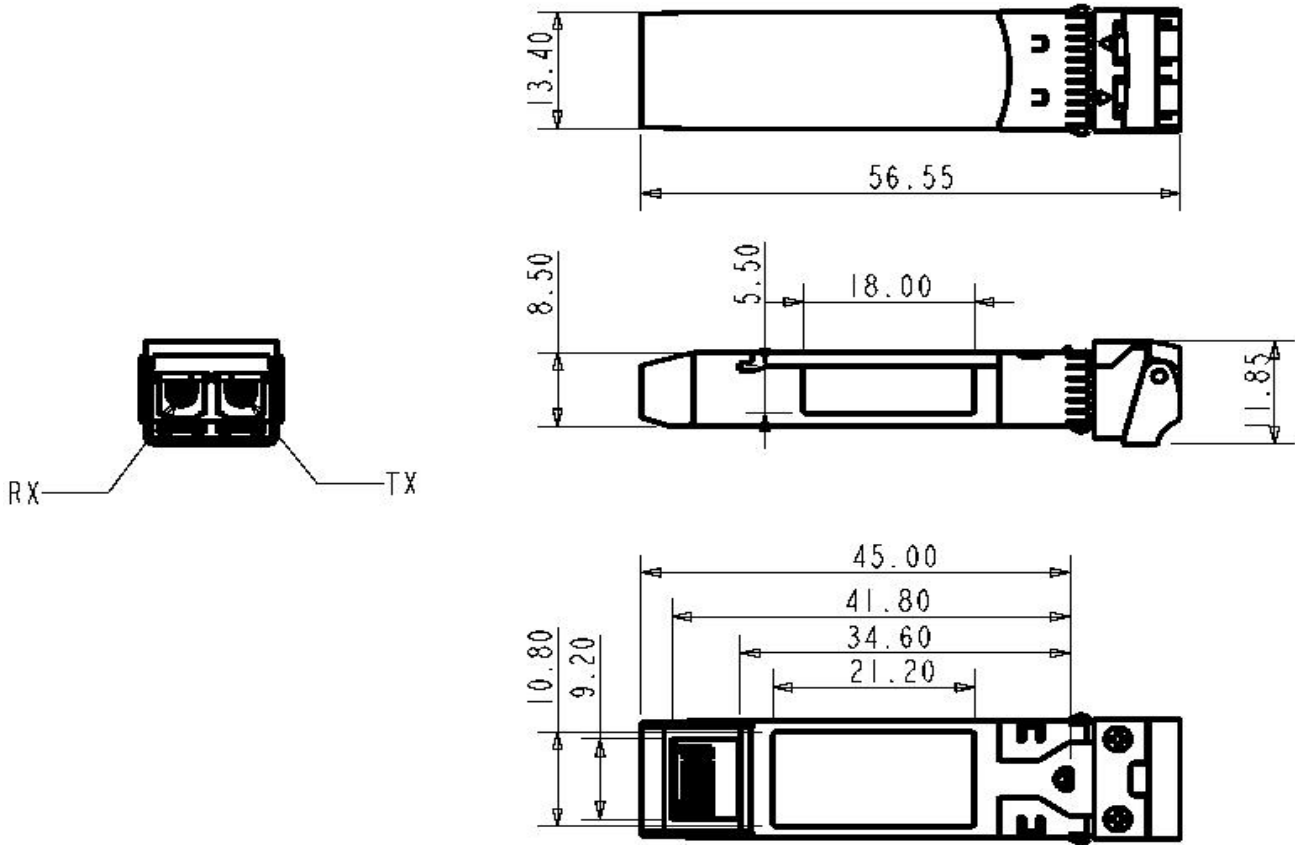
Notes:

1. Module ground pins GND are isolated from the module case. 2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board

Recommended Interface Circuit



Mechanical Dimensions



Regulatory Compliance

Gigalight GSS-MPO280-eSRC transceivers are Class 1 Laser Products. They are certified per the following standards:

| Feature | Agency | Standard |
|-------------------|----------|--|
| Laser Eye Safety | FDA/CDRH | CDRH 21 CFR 1040 and Laser Notice 50 |
| Laser Eye Safety | TÜV | IEC 60825-1:2014 EN 60825-1:2014 EN 60825-2:2004+A1+A2 |
| Electrical Safety | TÜV | EN 60950-1:2006+A11+A1+A12+A2 |
| Electrical Safety | UL/CSA | UL 60950-1 & CAN/CSA C22.2 No.60950-1 |
| EMC | FCC | 47 CFR FCC Part 15 Subpart B |
| EMC | CE-EMC | EN 55032:2015 EN 55024:2010+A1:2015 EN 61000-3-2:2014 EN 61000-3-3:2013 |

Comply with the following directives:

Low Voltage Directive (LVD) 2014/35/EU,

Electromagnetic Compatibility Directive (EMC) 2014/30/EU,

Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU with amendment 2015/863,

Chemical substances (REACH) Regulation (EC)No 1907/2006

References

1. SFP MSA
2. 25GBASE-SR
3. Directive 2011/65/EU of the European Parliament and of the Council, "on the restriction of the use of certain hazardous substances in electrical and electronic equipment," July 1, 2011.

CAUTION:

Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Ordering Information

| Part Number | Product Description |
|-----------------|--|
| GSS-MPO280-eSRC | 32GFC SFP28 SR, 28.05Gb/s, 850nm, 100m, OM4 MMF without FEC, 0°C to 70°C |

Important Notice

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Revision History

| Revision | Date | Description |
|----------|-------------|------------------|
| V0 | May-21-2020 | Advance Release. |