

50G SFP56 BIDI eLR Transceiver GBS-2731500-L3T

Features

- ✓ Hot-pluggable SFP28 form factor
- ✓ Maximum link length of 30km
- ✓ Single LC receptacle, Bi-directional
- ✓ Up to 53.125Gbps (26.5625GBd PAM4)
- ✓ CWDM EML laser and APD photo-detector
1270nm Tx/1310nm Rx
- ✓ Single 3.3V power supply
- ✓ Power dissipation < 3W
- ✓ RoHS compliant (lead free)
- ✓ Industrial case temperature range: -40°C to 85°C



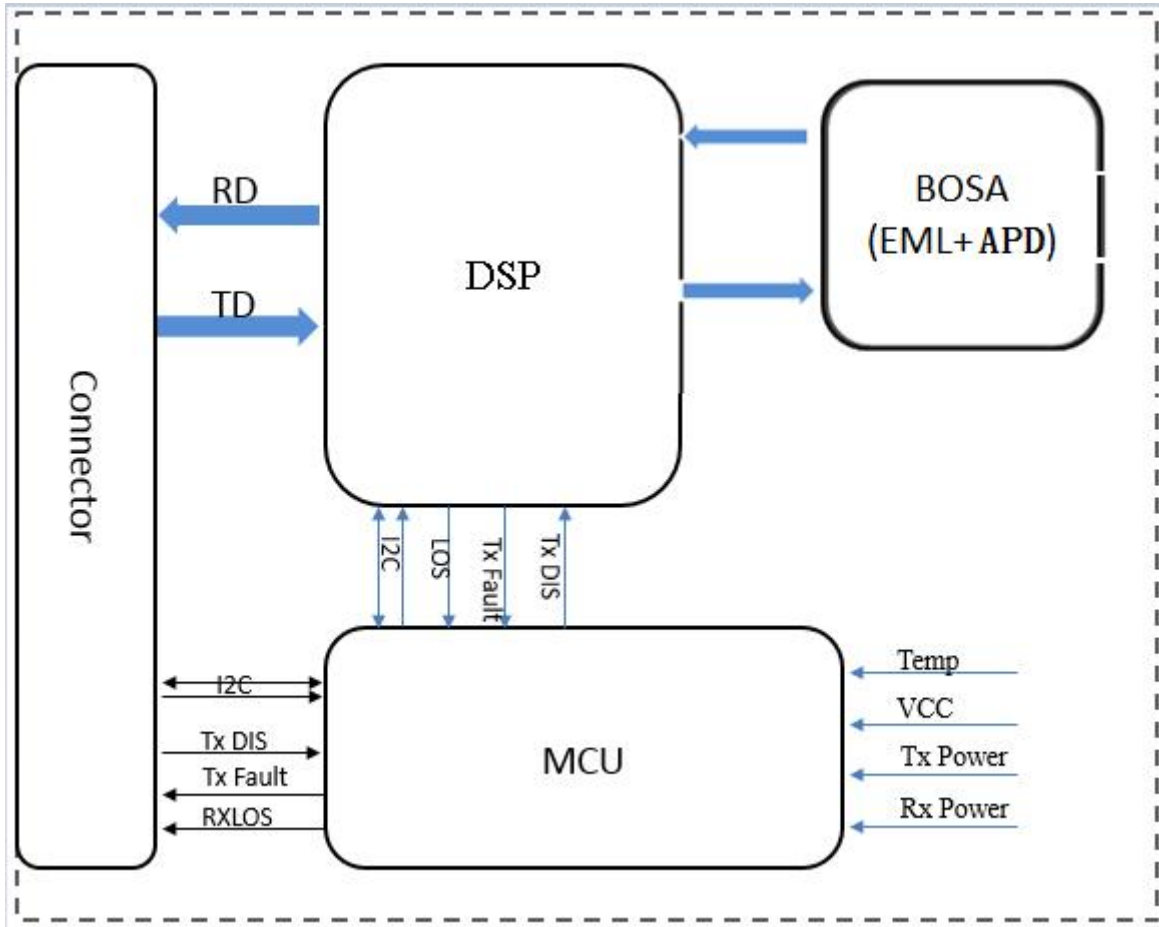
Applications

- ✓ IEEE 802.3cd 50GBASE
- ✓ Other Optical Link

Description

The Gigalight Technologies GBS-2731500-L3T is a single-Channel, Pluggable, Fiber-Optic SFP56 for 26.5625GBd PAM4 Ethernet Applications. It is a high performance module for data communication and interconnect applications which operate at 53.125 Gbps up to 30km. This module is designed to operate over single mode fiber systems by using 1270nm transmitter and 1310nm receiver. The electrical interface uses a 20 contact edge type connector. The optical interface uses single LC receptacle. This module incorporates Gigalight Technologies proven circuit and technology to provide reliable long life, high performance, and consistent service.

Block Diagram



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

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------|--------|-----|---------|-----|------|
| Operating Case Temperature | Tc | -40 | | +85 | °C |

| | | | | | |
|----------------------|-----------------|------|-----|------|---|
| Power Supply Voltage | V _{cc} | 3.13 | 3.3 | 3.47 | V |
| Power Dissipation | P _m | | | 3 | W |

Electrical Specifications

| Parameter | Symbol | Min | Typical | Max | Unit |
|--|-------------------|----------------------|---------|-----------------|-------|
| Differential Input Impedance | Z _{in} | 90 | 100 | 110 | ohm |
| Differential Output Impedance | Z _{out} | 90 | 100 | 110 | ohm |
| Differential Input Voltage Amplitude ¹ | ΔV _{in} | | | 900 | mVp-p |
| Differential Output Voltage Amplitude ² | ΔV _{out} | | | 900 | mVp-p |
| Input Logic Level High | V _{IH} | 2.0 | | V _{cc} | V |
| Input Logic Level Low | V _{IL} | 0 | | 0.8 | V |
| Output Logic Level High | V _{OH} | V _{cc} -0.5 | | V _{cc} | V |
| Output Logic Level Low | V _{OL} | 0 | | 0.4 | V |

Notes:

- 1、Differential input voltage amplitude is measured between TxnP and TxnN.
- 2、Differential output voltage amplitude is measured between RxnP and RxnN.

Optical Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|--|------------------|------|---------|-----|------|-------|
| Transmitter | | | | | | |
| Centre Wavelength | λ _c | | 1270 | | nm | - |
| Side-mode suppression ratio | SMSR | 30 | - | - | dB | - |
| Average launch power | P _{out} | -1.6 | - | 4.6 | dBm | - |
| Optical Modulation Amplitude (OMA outer) | OMA | 1.4 | - | 5.4 | dBm | - |
| Transmitter and dispersion eye closure(TDEC) | TDEC | - | - | 3.2 | dB | |
| Extinction Ratio | ER | 6 | - | - | dB | - |

| Average launch power of OFF transmitter | | - | - | -30 | dB | - |
|---|-------------|-----|------|-------|-----|---|
| Receiver | | | | | | |
| Centre Wavelength | λ_c | | 1313 | | nm | - |
| Receiver Sensitivity in OMA outer | RXsen | - | -17 | -15.1 | dBm | 1 |
| Average receive power | Pin | -17 | - | -3.4 | dBm | - |
| Receiver Reflectance | | - | - | -26 | dB | - |
| LOS Assert | | -25 | - | - | dBm | - |
| LOS De-Assert | | - | - | -18 | dBm | - |
| LOS Hysteresis | | 0.5 | - | - | dB | - |

Note:

- 1、 Measured with conformance test signal at TP3 for BER = 2.4E-4 Pre-FECs

DIAGNOSTIC MONITORING INTERFACE (OPTIONAL)

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

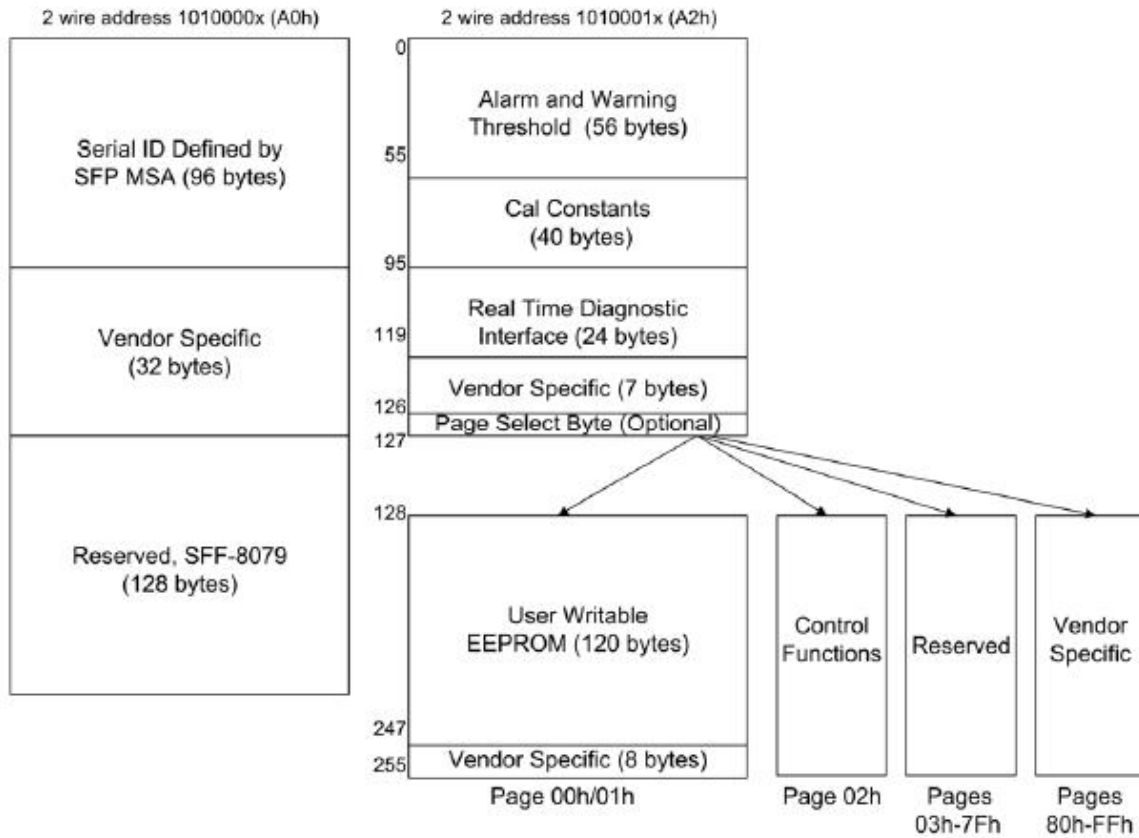
| Parameter | Symbol | Min | Max | Units | Notes |
|---|--------------|------|-----|-------|----------------------------------|
| Temperature monitor absolute error | DMI_Temp | -3 | +3 | degC | Over operating temperature range |
| Supply voltage monitor absolute error | DMI_VCC | -0.1 | 0.1 | V | Over full operating range |
| Channel RX power monitor absolute error | DMI_RX_Ch | -2 | 2 | dB | 1 |
| Channel Bias current monitor | DMI_Ibias_Ch | -10% | 10% | mA | |
| Channel TX power monitor absolute error | DMI_TX_Ch | -2 | 2 | dB | 1 |

Notes:

- 1、 Due to measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.

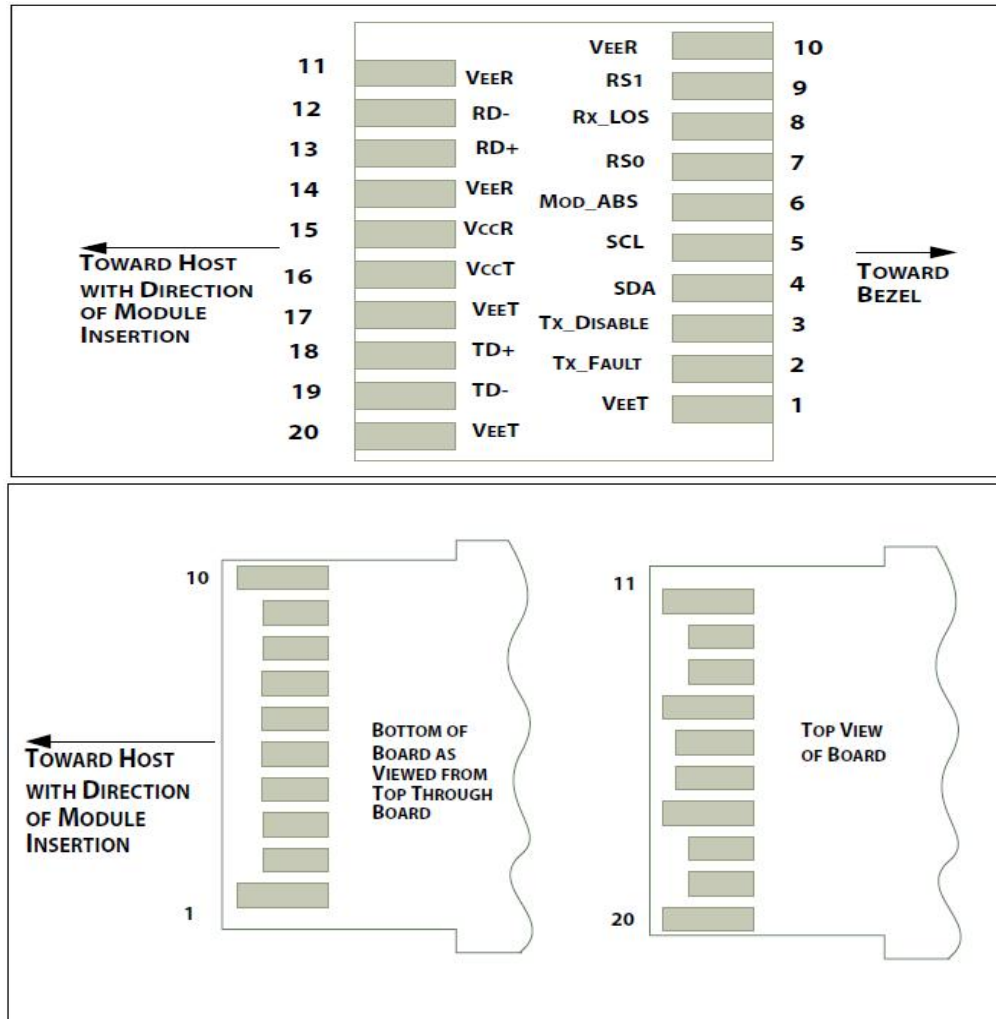
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA). The memory map specific data field defines as following.

Two-wire Interface Fields



TWO-WIRE INTERFACE FIELDS

Pin Definitions



Pin Descriptions

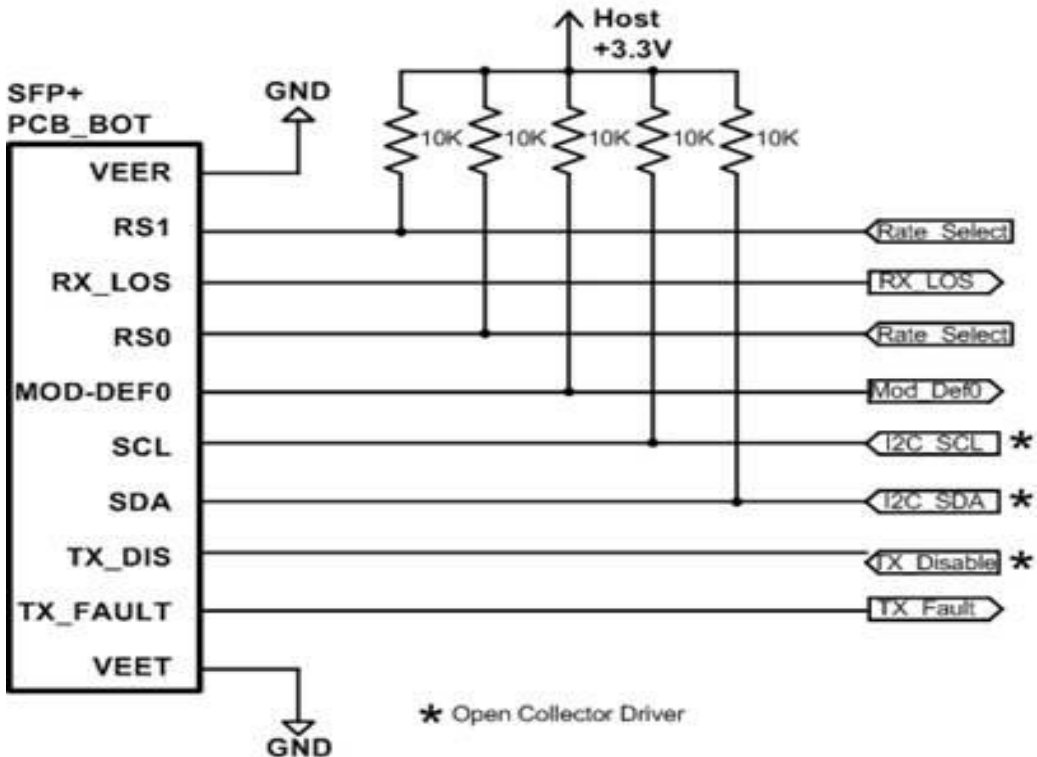
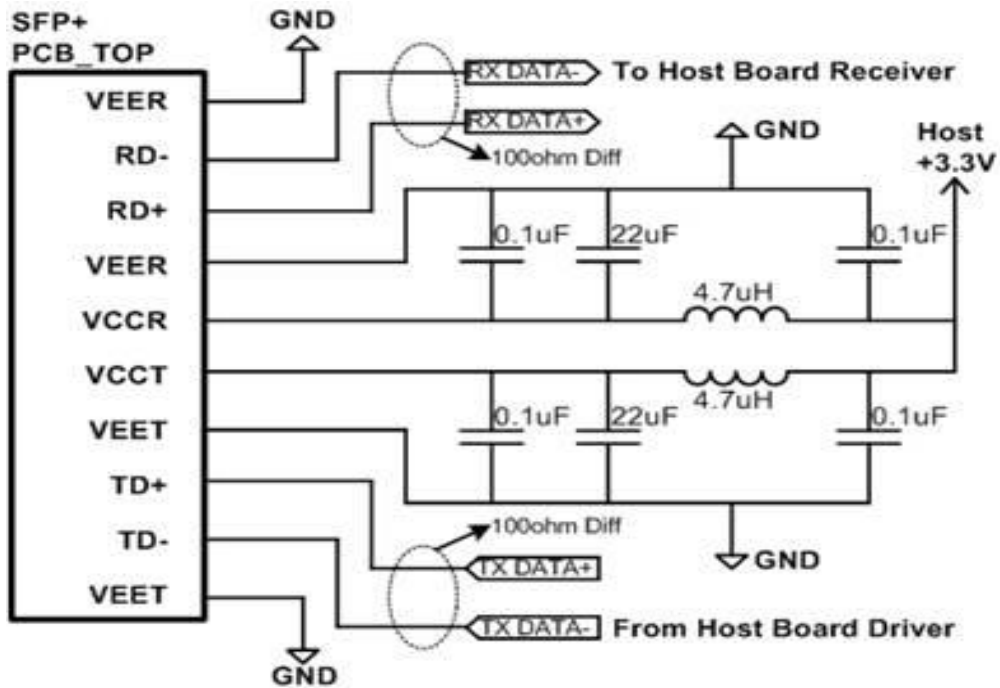
| PIN | Logic | Symbol | Name / Description | Note |
|-----|-----------|----------|---|------|
| 1 | | VeeT | Module Transmitter Ground | 1 |
| 2 | LVTTL-O | TX_Fault | Module Transmitter Fault | 2 |
| 3 | LVTTL-I | TX_Dis | Transmitter Disable; Turns off transmitter laser output | |
| 4 | LVTTL-I/O | 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 |

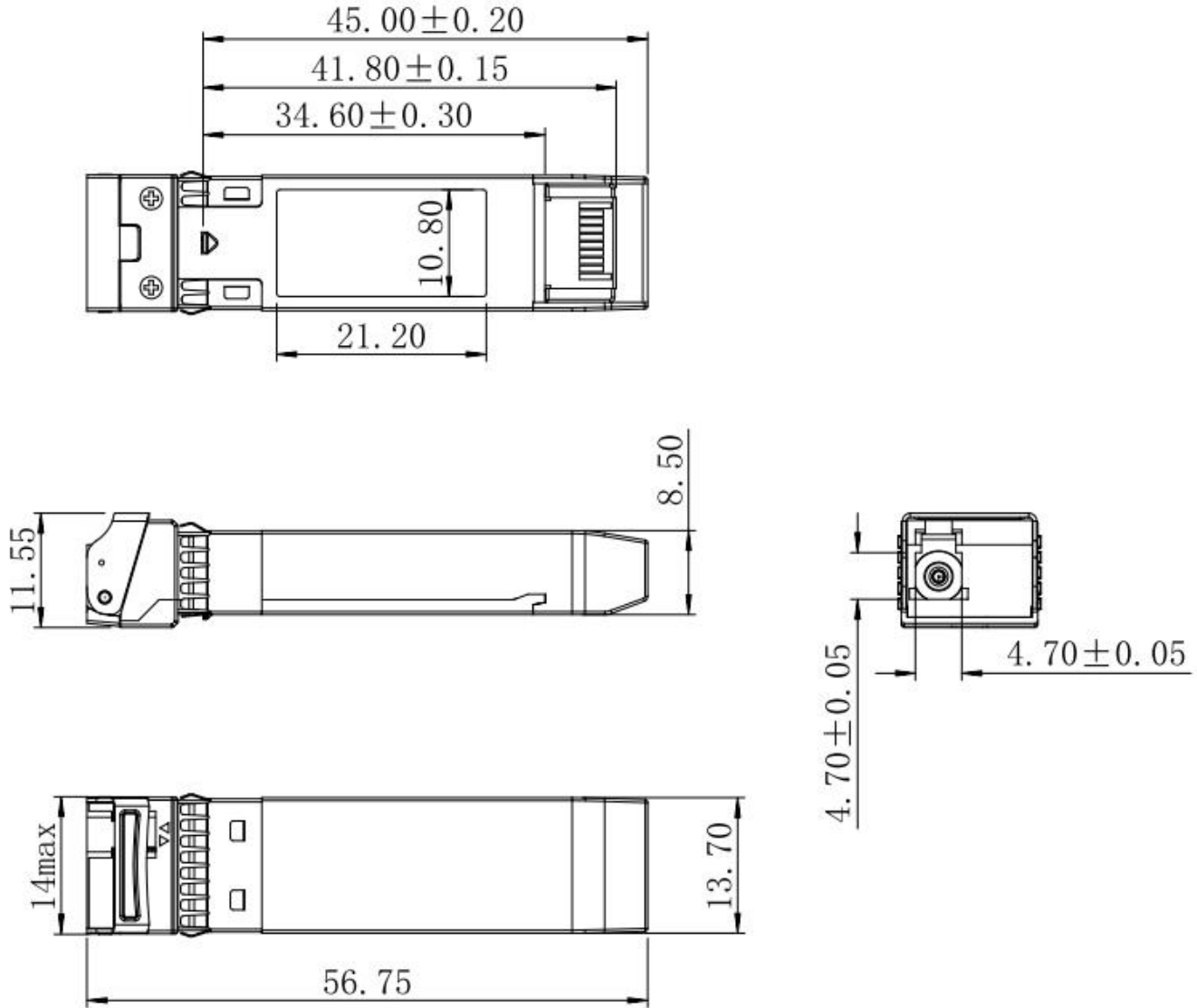
Notes:

- 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 GBS-2731500-L3T transceivers are Class 1 Laser Products. They meet the requirements of the following standards:

| Feature | Standard |
|--------------|--|
| Laser Safety | IEC 60825-1:2014 (3 rd Edition) IEC 60825-2:2004/AMD2:2010 EN 60825-1-2014 EN 60825-2:2004+A1+A2 |

| | |
|--------------------------|--|
| Electrical Safety | EN 62368-1: 2014 IEC 62368-1:2014 UL 62368-1:2014 |
| Environmental protection | Directive 2011/65/EU with amendment(EU)2015/863 |
| CE EMC | EN55032: 2015 EN55035: 2017 EN61000-3-2:2014 EN61000-3-3:2013 |
| FCC | FCC Part 15, Subpart B; ANSI C63.4-2014 |

References

1. SFP-8472 V12.3
2. SFP-8431
3. IEEE 802.3cd 50GBASE-ER
4. OIF CEI-56G-VSR-PAM4

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 |
|-----------------|--|
| GBS-2731500-L3T | 53Gbps, 1270nm Tx/1310nm Rx, 30km, -40°C ~ +85°C |

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Gigalight before they become applicable to any particular order or contract. In accordance with the Gigalight policy of continuous improvement specifications may change without notice.

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Revision History

| Revision | Date | Description |
|----------|------------|------------------|
| V0 | Jan-4-2023 | Advance Release. |