

## SFP-10GLRLC-1570-OPC

Moxa® SFP-10GLRLC-1570 Compatible TAA 10GBase-CWDM SFP+ Transceiver (SMF, 1570nm, 10km, LC, DOM)

### Features

- Single 3.3V Power Supply Voltage
- CWDM DFB Laser Transmitter
- Compliant with IEEE 802.3ae 10GBASE-LR/LW
- Up to 10.7Gbps Bi-Directional Data Links
- Single-Mode Fiber
- Hot-Pluggable
- Duplex LC Connector
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free
- Excellent ESD Protection
- RoHS Compliant and Lead Free



### Applications:

- 10x Gigabit Ethernet over CWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise
- Mobile Fronthaul CPRI/OBSAI

### Product Description

This Moxa® SFP-10GLRLC-1570 compatible SFP+ transceiver provides 10GBase-CWDM throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1570nm via an LC connector. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Moxa®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

### CWDM Available Wavelengths

| Wavelengths | Min.   | Typ. | Max.   |
|-------------|--------|------|--------|
| 27          | 1264.5 | 1271 | 1277.5 |
| 29          | 1284.5 | 1291 | 1297.5 |
| 31          | 1304.5 | 1311 | 1317.5 |
| 33          | 1324.5 | 1331 | 1337.5 |
| 35          | 1344.5 | 1351 | 1357.5 |
| 37          | 1364.5 | 1371 | 1377.5 |
| 39          | 1384.5 | 1391 | 1397.5 |
| 41          | 1404.5 | 1411 | 1417.5 |
| 43          | 1424.5 | 1431 | 1437.5 |
| 45          | 1444.5 | 1451 | 1457.5 |
| 47          | 1464.5 | 1471 | 1477.5 |
| 49          | 1484.5 | 1491 | 1497.5 |
| 51          | 1504.5 | 1511 | 1517.5 |
| 53          | 1524.5 | 1531 | 1537.5 |
| 55          | 1544.5 | 1551 | 1557.5 |
| 57          | 1564.5 | 1571 | 1577.5 |
| 59          | 1584.5 | 1591 | 1597.5 |
| 61          | 1604.5 | 1611 | 1617.5 |

### Absolute Maximum Ratings

| Parameter                  | Symbol | Min. | Typ.    | Max.              | Unit | Notes |
|----------------------------|--------|------|---------|-------------------|------|-------|
| Maximum Supply Voltage     | Vcc    | -0.5 |         | 4.0               | V    | 1     |
| Storage Temperature        | Tstg   | -40  |         | 90                | °C   | 2     |
| Operating Case Temperature | Tc     | 0    |         | 70                | °C   | 3     |
| Maximum Bitrate            | BER    |      |         | 10 <sup>-12</sup> |      |       |
| Data Rate                  | DR     |      | 10.3125 |                   | Gbps | 4     |

#### Notes:

1. For the electrical power interface.
2. Ambient temperature.
3. Case temperature.

## Electrical Characteristics

| Parameter                      | Symbol                         | Min.            | Typ. | Max.                 | Unit | Notes |
|--------------------------------|--------------------------------|-----------------|------|----------------------|------|-------|
| Power Supply Voltage           | V <sub>cc</sub>                | 3.14            | 3.30 | 3.46                 | V    |       |
| Power Supply Current           | I <sub>cc</sub>                |                 | 200  | 310                  | mA   | 1     |
| Power Consumption              | PC                             |                 | 0.65 | 1.0                  | W    |       |
| Transmitter                    |                                |                 |      |                      |      |       |
| Differential Data Input Swing  | V <sub>IN,pp</sub>             | 180             |      | 700                  | mV   |       |
| Input Differential Impedance   | R <sub>IN</sub>                |                 | 100  |                      | Ω    |       |
| Transmit Disable Voltage       | V <sub>D</sub>                 | 2               |      | V <sub>cc</sub>      | V    |       |
| Transmit Enable Voltage        | V <sub>EN</sub>                | V <sub>ee</sub> |      | V <sub>ee</sub> +0.8 | V    |       |
| Receiver                       |                                |                 |      |                      |      |       |
| Differential Data Output Swing | V <sub>OUT,pp</sub>            | 300             |      | 850                  | mV   |       |
| Output Differential Impedance  | T <sub>r</sub> /T <sub>f</sub> | 28              |      |                      | ps   |       |
| LOS Assert                     | V <sub>LOSA</sub>              | 2               |      | Host_V <sub>cc</sub> | V    |       |
| LOS De-Assert                  | V <sub>LOSD</sub>              | V <sub>ee</sub> |      | V <sub>ee</sub> +0.5 | V    |       |

### Notes:

1. For the electrical power interface.

## Optical Characteristics

| Parameter                       | Symbol             | Min.  | Typ. | Max.  | Unit  | Notes |
|---------------------------------|--------------------|-------|------|-------|-------|-------|
| <b>Transmitter</b>              |                    |       |      |       |       |       |
| Optical Power (Average)         | P <sub>TX</sub>    | 2     |      | 7     | dBm   | 1     |
| Transmitter Dispersion Penalty  | TDP                |       |      | 4     | dB    |       |
| Optical Extinction Ratio        | ER                 | 3.5   |      |       | dB    |       |
| Optical Wavelength              | λ <sub>C</sub>     | λ-6.5 | λ    | λ+6.5 | nm    |       |
| Side-Mode Suppression Ratio     | SMSR               | 30    |      |       | dB    |       |
| Relative Intensity Noise        | RIN                |       |      | -128  | dB/Hz |       |
| Launch Power of Off Transmitter | P <sub>off</sub>   |       |      | -30   | dBm   | 1     |
| <b>Receiver</b>                 |                    |       |      |       |       |       |
| Receiver Sensitivity @10.3Gbps  | R <sub>X_SEN</sub> |       |      | -14.4 | dBm   | 2     |
| Receiver Overload               | P <sub>OL</sub>    | 2     |      |       | dBm   |       |
| Receiver Wavelength             | λ <sub>C</sub>     | 1260  |      | 1620  | nm    |       |
| Receiver Reflectance            | TR <sub>RX</sub>   |       |      | -12   | dB    |       |
| LOS Assert                      | LOSA               | -30   |      |       | dBm   |       |
| LOS De-Assert                   | LOSD               |       |      | -17   | dBm   |       |
| LOS Hysteresis                  | LOSH               | 0.5   |      |       | dB    |       |

### Notes:

1. Average.
2. Average. Measured with worst ER, BER<10<sup>-12</sup>, and 2<sup>31</sup>-1 PRBS.

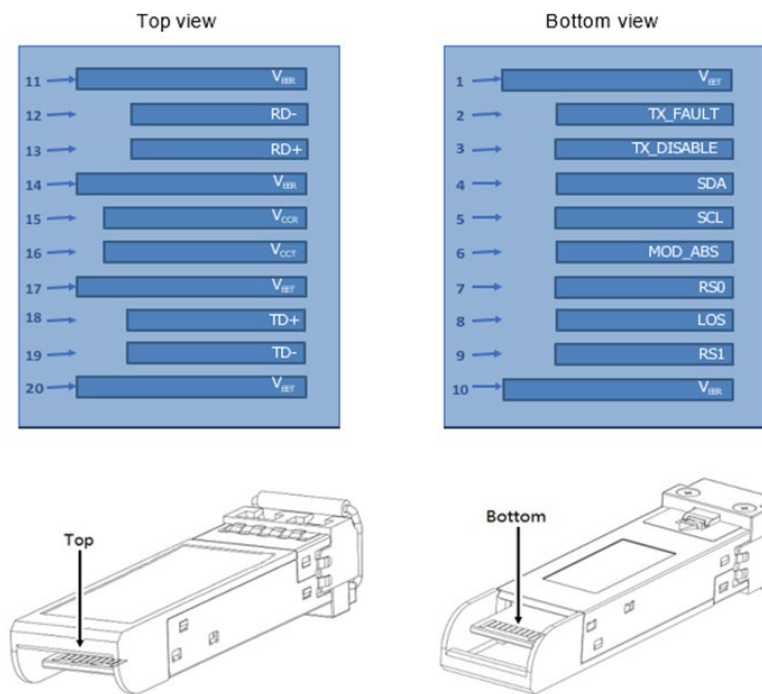
## Pin Descriptions

| Pin | Symbol     | Name/Description                                                 | Notes |
|-----|------------|------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground (Common with Receiver Ground).                | 1     |
| 2   | Tx_Fault   | Transmitter Fault.                                               | 2     |
| 3   | Tx_Disable | Transmitter Disable. Laser output disabled on “high” or “open.”  | 3     |
| 4   | SDA        | 2-Wire Serial Interface Data.                                    | 4     |
| 5   | SCL        | 2-Wire Serial Interface Clock.                                   | 4     |
| 6   | MOD_ABS    | Module Absent. Grounded within the module.                       | 4     |
| 7   | RS0        | No Connection Required.                                          |       |
| 8   | Rx_LOS     | Loss of Signal Indication. “Logic 0” indicates normal operation. | 5     |
| 9   | RS1        | No Connection Required.                                          | 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       | Transmitter Ground (Common with Receiver Ground).                | 1     |
| 18  | TD+        | Transmitter Non-Inverted Data In. AC Coupled.                    |       |
| 19  | TD–        | Transmitter Inverted Data In. AC Coupled.                        |       |
| 20  | VeeT       | Transmitter Ground (Common with Receiver Ground).                | 1     |

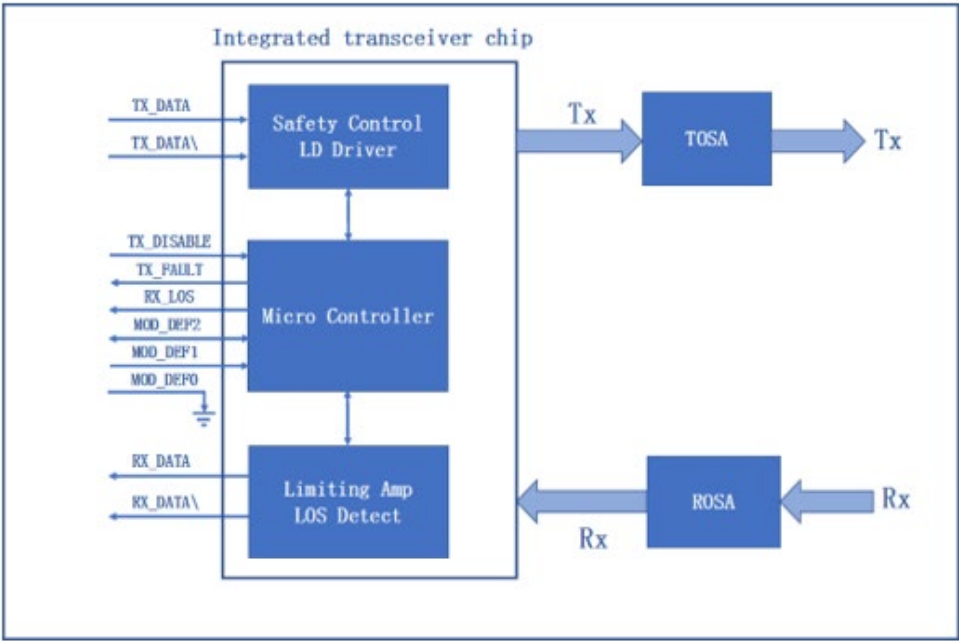
### Notes:

1. The circuit ground is isolated from the chassis ground.
2. Tx\_Fault is the open collector output and should be pulled up with 4.7kΩ to 10kΩ on the host board to a voltage between 2V and Vcc+0.3V.
3. Disabled: T<sub>DIS</sub>>2V or open, enabled: T<sub>DIS</sub><0.8V.
4. Should be pulled up with 4.7kΩ to 10kΩ on the host board to a voltage between 2V and Vcc+0.3V.
5. LOS is an open collector output and should be pulled up with 4.7kΩ to 10kΩ on the host board to a voltage between 2V and Vcc+ 0.3V. The “logic 0” indicates normal operation. “Logic 1” indicates that the receiver signal is lost.

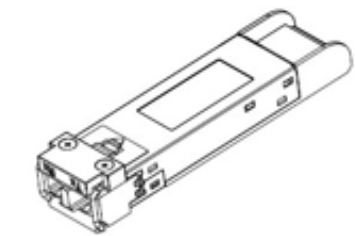
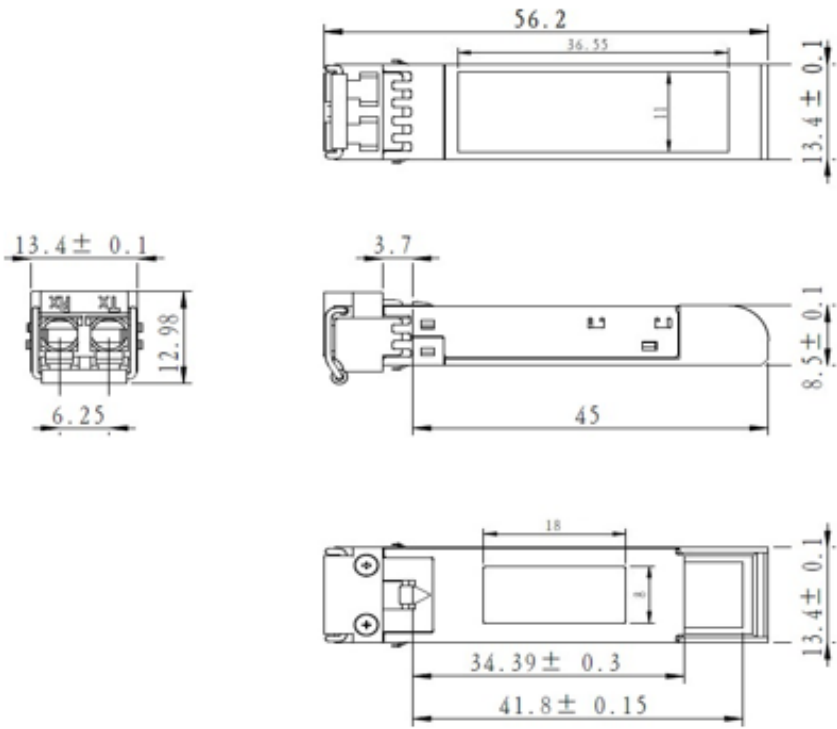
Electrical Pad Layout



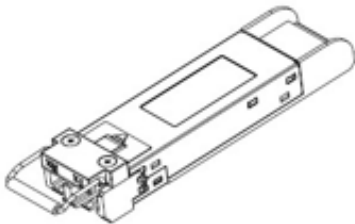
Block Diagram of Transceiver



Mechanical Specifications



LATCHED



UNLATCHED