# Product Specification

## 9.95 Gbps ~ 11.3Gbps 0℃ ~ 85℃ 10km SFP+

# CLSFP10GBD3210I-LF

## Product Features

- 9.95 Gbps ~ 11.3Gbps data links
- 10km with 9/125μm SMF
- Tx: 1330nm DFB laser Rx: 1270nm PIN-TIA
- Simplex LC Connector
- Hot-pluggable SFP+ footprint
- Single 3. 3V power supply
- Operating temperature: 0℃ to 85℃
- RoHS
- Power Consumption < 1.5W
- Digital Diagnostic Monitor (DDM) meet SFF-8472

## Applications

√ 10GBase BiDi Ethernet

√ CPRI 10G

| PART NUMBER | CLASP COLOR |
|---|---|
| CLSFP10GBD3210I-LF | GREEN |

## 1. Product Description

The CLSFP10GBD3210I-LF is a 9.95 Gbps ~ 11.3Gbps enhanced small form factor pluggable SFP+ transceiver compatible with 10GBASE-LR/LW and 10G Fiber Channel 1200-SM-LL-L. It is suitable for high temperature single-mode fiber (SMF) communications in 10Gbps Ethernet and 10G Fiber Channel.

## 2. Regulatory Compliance

C-light transceivers are Class 1 Laser Products comply with FDA regulations. Meet

Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950. Meet RoHS, EN55022 class B, IEC 61000-4-2.

## 3. Absolute Maximum Ratings

| Parameter | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Supply Voltage | Vcc | -0.5 | 4 | V |
| Storage Temperature | Ts | -40 | 85 | °C |
| Operating Case Temperature | Tc | 0 | 85 | °C |

## 4. Recommended Operating Conditions

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| Operating Case Temperature | Tc | 0 | | 85 | °C |
| Power Supply Voltage | Vcc | 3.135 | 3.3 | 3.465 | V |
| Power Supply Current | Icc | | | 450 | mA |
| Data Rate | | 9.95 | 10 | 11.3 | Gbps |
| Max Link Length on 9/125μm SMF | Lmax | | 10 | | km |

## 5. Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| **Transmitter** | | | | | |
| Centre Wavelength | λc | 1320 | 1330 | 1340 | nm |
| Spectral Width (-20dB) | σ | | | 1 | nm |
| Average Output Power | Pout | -6 | | -1 | dBm |
| Extinction Ratio | ER | 3.5 | | | dB |
| Average Launch Power of Off Transmitter | Poff | | | -30 | dBm |
| **Receiver** | | | | | |
| Centre Wavelength | λc | 1260 | 1270 | 1280 | nm |
| Receiver Sensitivity | PIN | | | -14.5 | dBm |
| Receiver Overload | Pmax | 2 | | | dBm |
| LOS De-Assert | LOSD | | | -20 | dBm |
| LOS Assert | LOSA | -30 | | | dBm |
| LOS Hysteresis | | 0.5 | | 4.5 | dB |

## 6. Electrical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| **Transmitter** | | | | | |
| Input Differential Impedance | Zin | 80 | 100 | 120 | Ω |
| Single ended data input swing | Vin | 180 | | 700 | mV |
| Tx-Dis Disable | Vd | 2.0 | | Vcc | V |
| Tx-Dis Enable | Ven | 0 | | 0.8 | V |
| **Receiver** | | | | | |
| Output Differential Impedance | Zout | 90 | 100 | 120 | Ω |
| Single ended data output swing | Vout | 300 | | 850 | mV |
| Rx-Los Fault | Vlf | 2.0 | | $V_{CCHOST}$ | V |
| Rx-Los Normal | Vln | 0 | | 0+0.8 | V |
| Output rise and fall time | Tr, Tf | 30 | | | ps |

## 7. Pin Descriptions

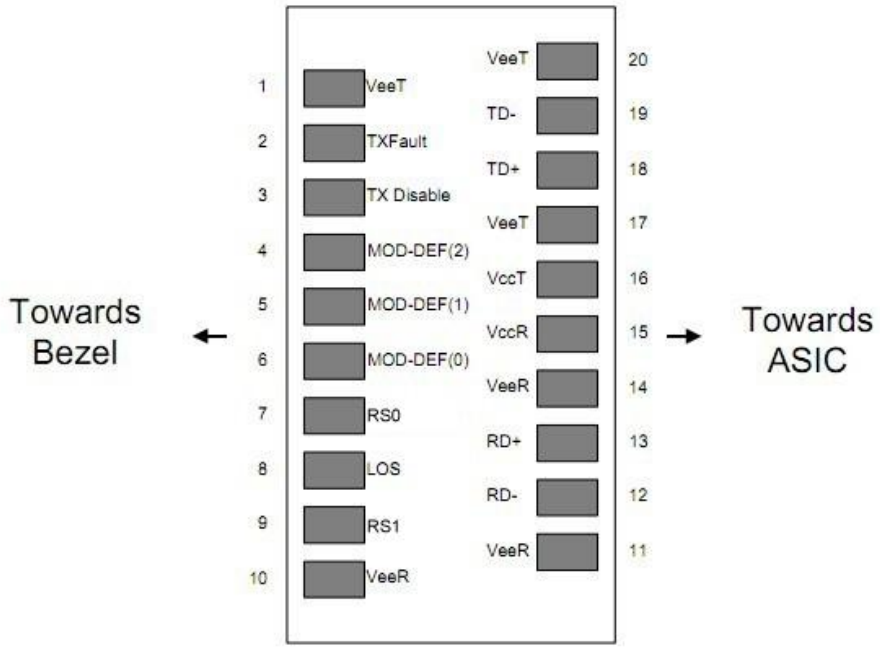



**Diagram of Host Board Connector Block Pin Numbers and Names**

| Pin | Symbol | Description | Ref. |
|---|---|---|---|
| 1 | VEET | Transmitter Ground (Common with Receiver Ground) | 7.1 |
| 2 | TFAULT | Transmitter Fault. | |
| 3 | TDIS | Transmitter Disable. Laser output disabled on high or open. | 7.2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 7.3 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 7.3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 7.3 |
| 7 | RS0 | Rate Select0, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 7.4 |
| 9 | RS1 | Rate Select1, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd | |
| 10 | VEER | Receiver Ground (Common with Transmitter Ground) | 7.1 |
| 11 | VEER | Receiver Ground (Common with Transmitter Ground) | 7.1 |
| 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) | 7.1 |
| 15 | VCCR | Receiver Power Supply | |
| 16 | VCCT | Transmitter Power Supply | |
| 17 | VEET | Transmitter Ground (Common with Receiver Ground) | 7.1 |
| 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) | 7.1 |

Notes:

7.1 Circuit ground is internally isolated from chassis ground.

7.2 Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

7.3 Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.

7.4 LOS is open collector output. Should be pulled up with 4.7k -10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

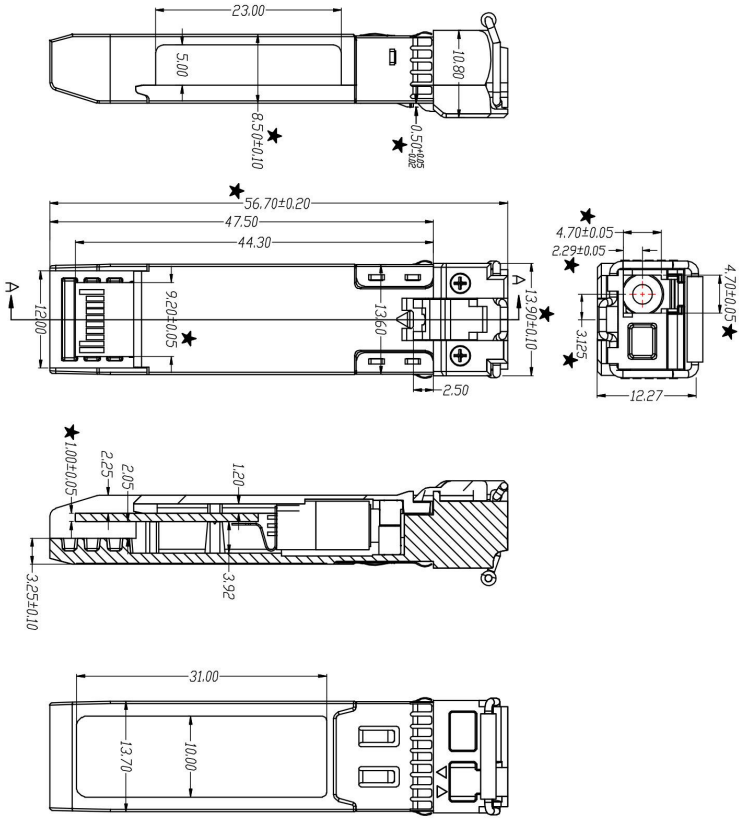
# 8. EEPROM

The 2-wire management interface according to SFF-8472 DDM (DOM) allows the device to read the status of the optical module (at least the parameters Tx, Rx, temperature, bias, voltage).

**2 wire address 1010000X (A0h)**

| |
|---|
| 0~95<br>Serial ID Defined by SFP MSA (96 bytes) |
| 96~127<br>Vendor Specific (32 bytes) |
| 128~255<br>Reserved (128 bytes) |

# 9. Mechanical Specifications



## Ordering Information

| Part No. | Data Rate | DDM | Wave | Fiber Type | Dist. | Temp. | Optical Interface |
|---|---|---|---|---|---|---|---|
| CLSFP10GBD3210I-LF | 9.95~11.3 Gbps | yes | Tx 1330nm Rx 1270nm | SMF | 10km | 0~85℃ | Single LC |

## CONTACT:

Shenzhen C-Light network communication co., Ltd

4F East, Building 1, Shunheda Factory Plant, Liuxiandong industrial park,
Xili, Nanshan Dist, Shenzhen PR. China
**Tel:** 86-755-2778-9180 **Fax:** 86-755-2778-9174
**E-mail:** sales@c-light.com http://www.c-light.com