



## 2.5Gbps TX:1310nm/RX:1490nm SMF 40km BiDi SFP LC Optical Transceiver

### CS3T4-48H-3M-Tx-L



#### DESCRIPTION

The CS3T4-48H-3M-Tx-L bi-directional SFP (Small Form Pluggable) transceivers are designed for use in 2.5Gbps links up to 40km over a single strand single-mode fiber.

#### FEATURES

- Compliant with SFF8472 diagnostic monitoring interface
- Simplex LC connector
- Differential inputs and outputs
- Single power supply 3.3V
- Hot pluggable
- Class 1 laser product compliant with EN 60825-1
- Input/Output: AC/AC
- LOS: LVTTTL
- LD Type: 1310 DFB

#### APPLICATIONS

- Single-mode core fiber backbone links up to 40km
- 2500M / OC48 / STM-16

#### PRODUCT OVERVIEW

| PART NUMBER       | OPERATING TEMPERATURE |
|-------------------|-----------------------|
| CS3T4-48H-3M-TC-L | 0°C to 70°C           |
| CS3T4-48H-3M-TI-L | -40°C to 85°C         |

## DIAGNOSTICS

| PARAMETER                   | RANGE      | ACCURACY | UNIT | CALIBRATION |
|-----------------------------|------------|----------|------|-------------|
| Module Internal Temperature | -40 to 95  | ±3       | °C   | External    |
| Module Internal Voltage     | 3.1 to 3.5 | ±0.1     | V    |             |
| Bias Current                | 0 to 100   | ±10%     | mA   |             |
| TX Power                    | -5 to +6   | ±3 dB    | dBm  |             |
| RX Power                    | -23 to 0   | ±3 dB    | dBm  |             |

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER           | SYMBOL          | MIN  | MAX             | UNIT | NOTES |
|---------------------|-----------------|------|-----------------|------|-------|
| Storage Temperature | T <sub>S</sub>  | -40  | 85              | °C   |       |
| Supply Voltage      | V <sub>CC</sub> | -0.5 | 4.0             | V    |       |
| Input Voltage       | V <sub>IN</sub> | -0.5 | V <sub>CC</sub> | V    |       |

## RECOMMENDED OPERATING CONDITIONS

| PARAMETER                  | SYMBOL                            | MIN | MAX | UNIT | NOTES             |
|----------------------------|-----------------------------------|-----|-----|------|-------------------|
| Case Operating Temperature | T <sub>C</sub>                    | 0   | 70  | °C   | CS3T4-48H-3M-TC-L |
|                            |                                   | -40 | 85  |      | CS3T4-48H-3M-TI-L |
| Supply Voltage             | V <sub>CC</sub>                   | 3.1 | 3.5 | V    |                   |
| Supply Current             | I <sub>TX</sub> + I <sub>RX</sub> | -   | 250 | mA   |                   |

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>C</sub> = 0°C to 70°C, -40°C to 85°C)

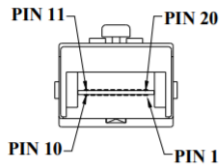
| PARAMETER                                 | SYMBOL  | MIN  | TYP. | MAX  | UNIT | NOTES   |
|---|---|------|------|------|------|---------|
| Bit Rate                                  | B   | -    | 2488 | -    | Mbps |         |
| Output Optical Power<br>9/125um fiber     | P <sub>out</sub>  | -2   | -    | +3   | dBm  | Average |
| Extinction Ratio                          | ER  | 6    | -    | -    | dB   |         |
| Center Wavelength                         | λ <sub>C</sub>  | 1285 | 1310 | 1335 | nm   |         |
| Spectral Width (-20dB)                    | Δλ  | -    | -    | 0.6  | nm   |         |
| Side Mode Suppression Ratio               | SMSR  | 30   |      |      | dB   |         |
| Output Eye                                | Compliant with Telcordia GR-253-CORE Issue 3 and ITU-T recommendation G-957 |      |      |      |      |         |
| Max. P <sub>out</sub> TX-DISABLE Asserted | P <sub>OFF</sub>  | -    | -    | -45  | dBm  |         |
| Differential Input Voltage                | V <sub>DIFF</sub>   | 0.4  | -    | 2.0  | V    |         |

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>C</sub> = 0°C to 70°C, -40°C to 85°C)

| PARAMETER                                   | SYMBOL              | MIN  | TYP. | MAX             | UNIT | NOTES                 |
|---|---------------------|------|------|-----------------|------|-----------------------|
| Bit Rate                                    | B                   | -    | 2488 | -               | Mbps |                       |
| Optical Input Power-Maximum                 | P <sub>IN</sub>     | 0    | -    | -               | dBm  | BER<10 <sup>-10</sup> |
| Optical Input Power-Minimum (Sensitivity)   | P <sub>IN</sub>     | -    | -    | -23             | dBm  | BER<10 <sup>-10</sup> |
| Operating Center Wavelength                 | λ <sub>C</sub>      | 1480 | -    | 1500            | nm   |                       |
| Optical Return Loss                         | ORL                 | 14   | -    | -               | dB   | λ=1480~1500nm         |
| LOS Asserted                                | P <sub>A</sub>      | -35  | -    | -               | dBm  |                       |
| LOS Deasserted                              | P <sub>D</sub>      | -    | -    | -23             | dBm  |                       |
| Differential Output Voltage                 | V <sub>DIFF</sub>   | 0.5  | -    | 1.2             | V    |                       |
| Receiver Loss of Signal Output Voltage-Low  | RX_LOS <sub>L</sub> | 0    | -    | 0.5             | V    |                       |
| Receiver Loss of Signal Output Voltage-High | RX_LOS <sub>H</sub> | 2.4  | -    | V <sub>CC</sub> | V    |                       |



## PIN ASSIGNMENT



| Pin | Signal Name    | Description                                       |
|-----|----------------|---|
| 1   | $T_{GND}$      | Transmit Ground                                   |
| 2   | $TX\_FAULT$    | Transmit Fault                                    |
| 3   | $TX\_DISABLE$  | Transmit Disable                                  |
| 4   | $MOD\_DEF (2)$ | SDA Serial Data Signal                            |
| 5   | $MOD\_DEF (1)$ | SCL Serial Clock Signal                           |
| 6   | $MOD\_DEF (0)$ | TTL Low   |
| 7   | $RATE\_SELECT$ | Open Circuit                                      |
| 8   | $RX\_LOS$      | Receiver Loss of Signal, TTL High, open collector |
| 9   | $R_{GND}$      | Receiver Ground                                   |
| 10  | $R_{GND}$      | Receiver Ground                                   |
| 11  | $R_{GND}$      | Receiver Ground                                   |
| 12  | $RX-$          | Receive Data Bar, Differential PECL, ac coupled   |
| 13  | $RX+$          | Receive Data, Differential PECL, ac coupled       |
| 14  | $R_{GND}$      | Receiver Ground                                   |
| 15  | $V_{CCR}$      | Receiver Power Supply                             |
| 16  | $V_{CCT}$      | Transmitter Power Supply                          |
| 17  | $T_{GND}$      | Transmitter Ground                                |
| 18  | $TX+$          | Transmit Data, Differential PECL, ac coupled      |
| 19  | $TX-$          | Transmit Data Bar, Differential PECL, ac coupled  |
| 20  | $T_{GND}$      | Transmitter Ground                                |

## EYE SAFETY MARK

The single-mode transceiver is a class 1 laser product. It complies with EN 60825-1 and FDA 21 CFR 1040.10 and 1040.11. In order to meet laser safety requirements, the transceiver shall be operated within the Absolute Maximum Ratings.

## Required Mark

**Class 1 Laser Product**  
Complies with  
21 CFR 1040.10 and 1040.11

**[Caution]** All adjustments have been done at the factory before the shipment of the devices. No maintenance and user serviceable part is required. Tampering with and modifying the performance of the device will result in voided product warranty.

**ADDITIONAL NOTES**

- Avoid eye or skin exposure to laser radiations.
- The device is sensitive to electro-static discharge (ESD). The device should be handled with ESD proof tools. To assemble the device on PCB, proper grounding is required to prevent ESD.
- Specifications are subject to change without notice.



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