



# 1.25Gbps TX:1490nm/RX:1310nm SMF 40km BiDi SFP LC Optical Transceiver

Model No. CS4T3-24H-3L-Tx-L

## FEATURES

- RoHS Compliant
- Compliant with IEEE802.3ah 1000BASE-BX application
- Compliant with SFF8472 Digital Diagnostic Standard
- Industry standard small form pluggable (SFP) package
- Hot pluggable
- Class 1 laser product compliant with EN 60825-1
- LD Type: 1490 DFB
- Distance: 40km



## DIAGNOSTICS

| PARAMETER    | RANGE      | ACCURACY | UNIT | CALIBRATION |
|--------------|------------|----------|------|-------------|
| Temperature  | -40 to 95  | ±3       | °C   | External    |
| Voltage      | 3.0 to 3.6 | ±0.1     | V    |             |
| Bias Current | 0 to 100   | ±10%     | mA   |             |
| TX Power     | -6 to +5   | ±3 dB    | dBm  |             |
| RX Power     | -23 to -3  | ±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   | CS4T3-24H-3L-TC-L |
|                                    |                                   | -40 | 85  |      | CS4T3-24H-3L-TI-L |
| Supply Voltage                     | V <sub>CC</sub>                   | 3.1 | 3.5 | V    |                   |
| Supply Current                     | I <sub>TX</sub> + I <sub>RX</sub> | -   | 300 | mA   |                   |
| Relative Humidity (Non-condensing) | RH                                | 5   | 95  | %    |                   |

**TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS ( $V_{CC} = 3.1V$  to  $3.5V$ ,  $T_C = 0^\circ C$  to  $70^\circ C$ ,  $-40^\circ C$  to  $85^\circ C$ )**

| PARAMETER                                     | SYMBOL                    | MIN  | TYP. | MAX      | UNIT  | NOTES   |
|---|---------------------------|------|------|----------|-------|---------|
| Output Optical Power<br>9/125um fiber         | $P_{out}$                 | -3   | -    | +2       | dBm   | Average |
| Extinction Ratio                              | ER                        | 7    | -    | -        | dB    |         |
| Center Wavelength                             | $\lambda_c$               | 1480 | -    | 1500     | nm    |         |
| Spectral Width (-20dB)                        | $\Delta\lambda$           |      |      | 0.88     | nm    |         |
| Rise/Fall Time (20%~80%)                      | $T_{r,f}$                 | -    | -    | 260      | ps    |         |
| Relative Intensity Noise                      | RIN                       | -    | -    | -120     | dB/Hz |         |
| Total Jitter                                  | TJ                        | -    | -    | 227      | ps    |         |
| Output Eye                                    | Compliant with IEEE802.3z |      |      |          |       |         |
| Max. $P_{out}$ TX-DISABLE Asserted            | $P_{OFF}$                 | -    | -    | -45      | dBm   |         |
| Differential Input Voltage                    | $V_{DIFF}$                | 0.4  | -    | 2.0      | V     |         |
| Transmit Fault Output-Low                     | TX_FAULT <sub>L</sub>     | 0.0  | -    | 0.5      | V     |         |
| Transmit Fault Output-High                    | TX_FAULT <sub>H</sub>     | 2.4  | -    | $V_{CC}$ | V     |         |
| Time to initialize, include reset of TX_FAULT | $t_{init}$                | -    | -    | 300      | ms    |         |
| TX_FAULT from fault to assertion              | $t_{fault}$               | -    | -    | 100      | us    |         |
| TX_DISABLE time to start reset                | $t_{reset}$               | 10   | -    | -        | us    |         |

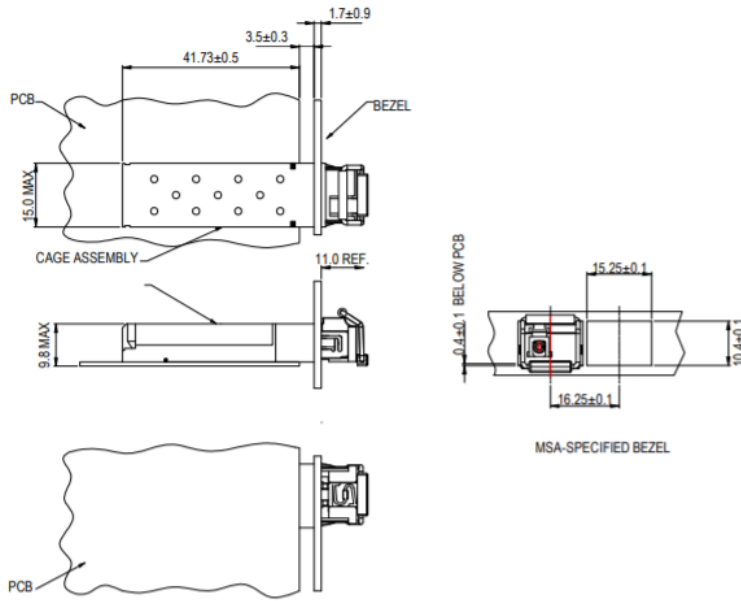
**RECEIVER ELECTRO-OPTICAL CHARACTERISTICS ( $V_{CC} = 3.1V$  to  $3.5V$ ,  $T_C = 0^\circ C$  to  $70^\circ C$ ,  $-40^\circ C$  to  $85^\circ C$ )**

| PARAMETER                                   | SYMBOL              | MIN  | TYP. | MAX      | UNIT | NOTES                        |
|---|---------------------|------|------|----------|------|------------------------------|
| Optical Input Power-Maximum                 | $P_{IN}$            | 0    | -    | -        | dBm  | PRBS7, BER<10 <sup>-12</sup> |
| RX Sensitivity                              | $P_{IN}$            | -    | -    | -23      | dBm  | PRBS7, BER<10 <sup>-12</sup> |
| Operating Center Wavelength                 | $\lambda_c$         | 1260 | -    | 1360     | nm   |                              |
| Optical Return Loss                         | ORL                 | 14   | -    | -        | dB   | $\lambda=1260\sim1360nm$     |
| Optical Isolation                           | ISO                 | -    | -    | -45      | dB   | $\lambda=1480\sim1500nm$     |
| LOS Deasserted                              | $P_D$               | -    | -    | -23      | dBm  |                              |
| LOS Asserted                                | $P_A$               | -35  | -    | -        | dBm  |                              |
| Differential Output Voltage                 | $V_{DIFF}$          | 0.5  | -    | 1.2      | V    |                              |
| Data Output Rise, Fall Time (20%~80%)       | $T_{r,f}$           | -    | -    | 0.35     | ns   |                              |
| 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  | -    | $V_{CC}$ | V    |                              |

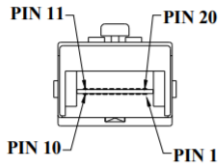




**ASSEMBLY DRAWING (unit: mm)**



**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 , ac coupled       |
| 13  | $RX+$          | Receive Data, Differential , 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 , ac coupled          |
| 19  | $TX-$          | Transmit Data Bar, Differential , ac coupled      |
| 20  | $T_{GND}$      | Transmitter Ground                                |

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**ORDERING INFORMATION**

| <b>PART NUMBER</b> | <b>OPERATING TEMPERATURE</b> |
|--------------------|------------------------------|
| CS4T3-24H-3L-TC-L  | 0°C to 70°C                  |
| CS4T3-24H-3L-TI-L  | -40°C to 85°C                |

**Note:** The specifications subject to change without notice.