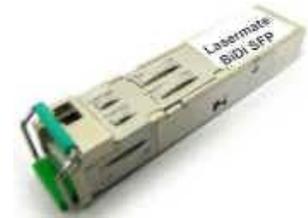




# 1.25Gbps TX:1490nm/RX:1310nm SMF 40km BiDi SFP LC Optical Transceiver

CS4T3-24H-3L-Tx-L



## DESCRIPTION

The CS4T3-24H-3L-Tx-L is a robust BiDi SFP optical transceiver designed for long-distance bidirectional transmission over a single strand of singlemode fiber (SMF). It supports a data rate of 1.25Gbps with a 1490nm transmitter (TX) and a 1310nm receiver (RX), enabling reliable communication up to 40 kilometers. Featuring a standard SFP form factor and an LC simplex connector, this module is ideal for Gigabit Ethernet, fiber access networks, and other high-performance optical communication applications requiring extended reach.

## 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

## APPLICATIONS

- Single-mode core fiber backbone links up to 40km
- 1000Base-BX

## PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CS4T3-24H-3L-TC-L	0°C to 70°C
CS4T3-24H-3L-TI-L	-40°C to 85°C

## 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	%	

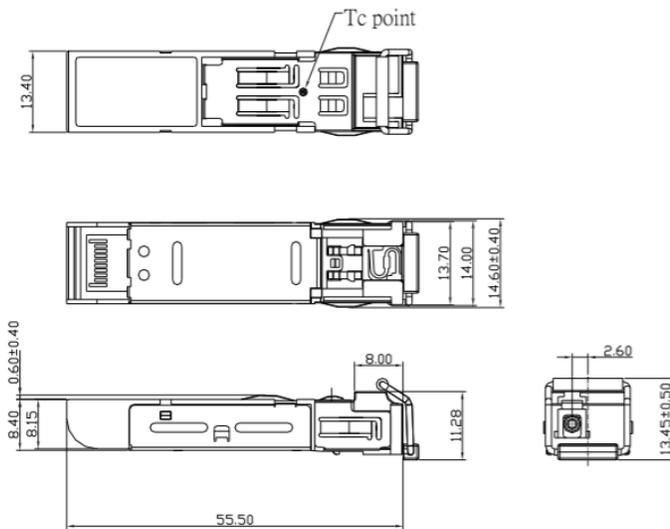
TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>C</sub> = 0°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Output Optical Power 9/125um fiber	P <sub>out</sub>	-3	-	+2	dBm	Average
Extinction Ratio	ER	7	-	-	dB	
Center Wavelength	λ <sub>C</sub>	1480	-	1500	nm	
Spectral Width (-20dB)	Δλ			0.88	nm	
Rise/Fall Time (20%~80%)	T <sub>r, f</sub>	-	-	260	ps	
Relative Intensity Noise	RIN	-	-	-120	dB/Hz	
Total Jitter	TJ	-	-	227	ps	
Output Eye	Compliant with IEEE802.3z					
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	
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 <sub>CC</sub>	V	
Time to initialize, include reset of TX_FAULT	t <sub>init</sub>	-	-	300	ms	
TX_FAULT from fault to assertion	t <sub>fault</sub>	-	-	100	us	
TX_DISABLE time to start reset	t <sub>reset</sub>	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	

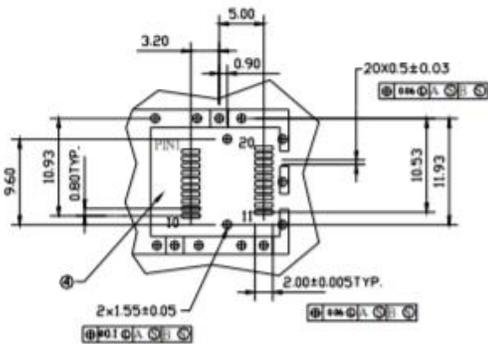
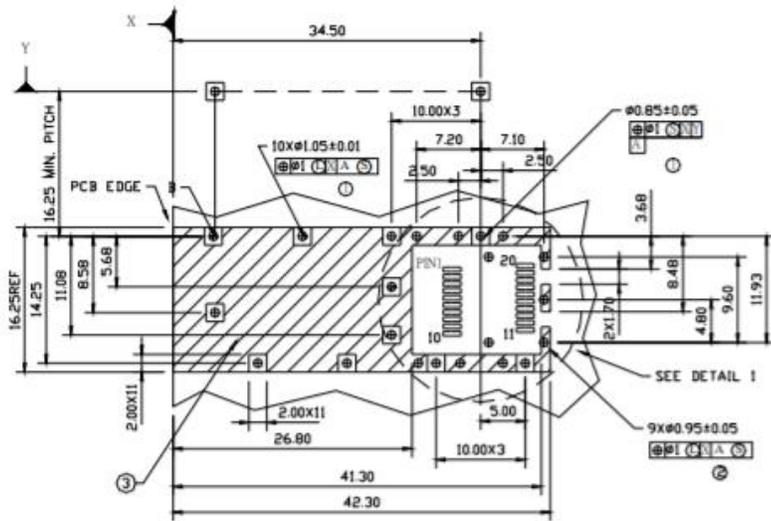
DIMENSIONS



DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE  $\pm 0.2mm$  UNLESS OTHERWISE SPECIFIED

SFP HOST BOARD MECHANICAL LAYOUT



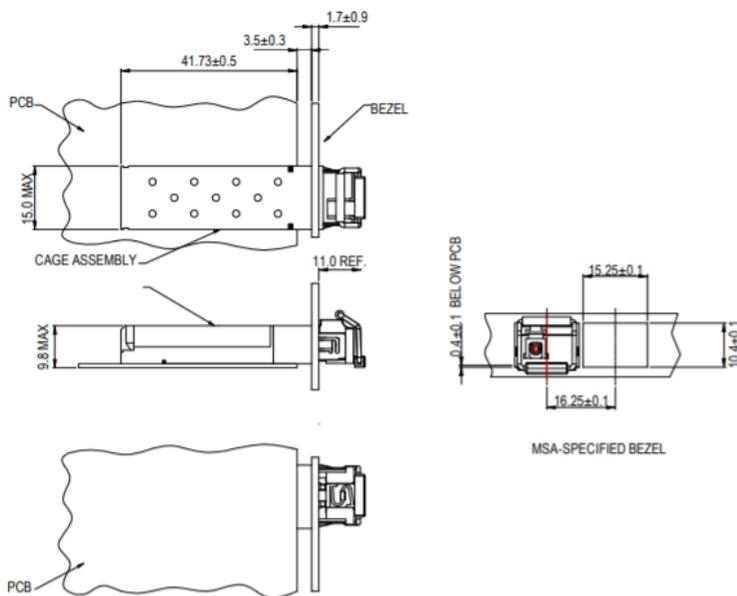
DETAIL 1

LEGEND

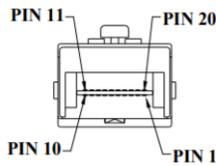
1. PADS AND VIAS ARE CHASSIS GROUND
2. THROUGH HOLES, PLATING OPTIONAL
3. HATCHED AREA DENOTES COMPONENT AND TRACE KEEPOUT (EXCEPT CHASSIS GROUND)
4. AREA DENOTES COMPONENT KEEPOUT (TRACES ALLOWED)

DIMENSIONS ARE IN MILLIMETERS

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

## 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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