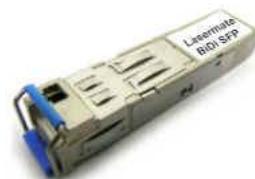




## 1.25Gbps TX:1310nm/RX:1490nm SMF 20km BiDi SFP LC Optical Transceiver

CS3T4-24H-3M-Tx-L



### DESCRIPTION

The CS3T4-24H-3M-Tx-L is a high-performance BiDi SFP optical transceiver designed for bidirectional communication over a single strand of singlemode fiber (SMF). Supporting a data rate of 1.25Gbps, this module features a 1310nm transmitter (TX) and a 1490nm receiver (RX) to deliver transmission distances of up to 20 kilometers. It is housed in a compact SFP form factor with an LC simplex connector, making it an ideal solution for Gigabit Ethernet, fiber access, and other long-distance optical network applications.

### 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: 1310 FP

### APPLICATIONS

- Single-mode core fiber backbone links up to 20km
- 1000Base-BX

### PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CS3T4-24H-3M-TC-L	0°C to 70°C
CS3T4-24H-3M-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	-11 to 0	±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	CS3T4-24H-3M-TC-L
		-40	85		CS3T4-24H-3M-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	%	

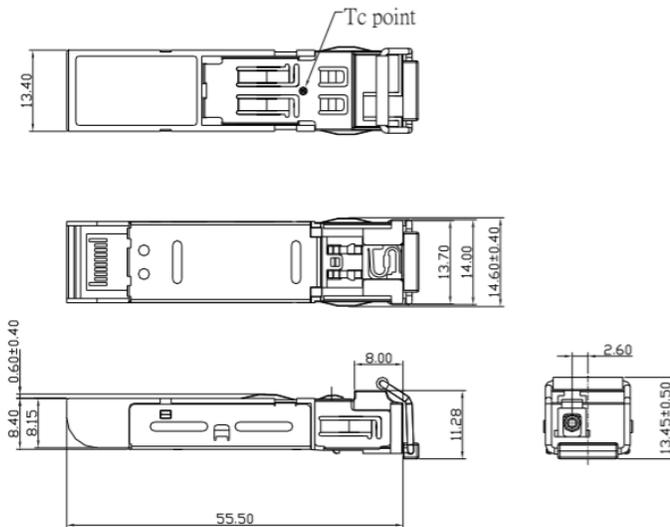
**TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>C</sub> = 0°C to 70°C, -40°C to 85°C)**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Output Optical Power 9/125um fiber	P <sub>out</sub>	-8	-	-3	dBm	Average
Extinction Ratio	ER	9	-	-	dB	
Center Wavelength	λ <sub>C</sub>	1260	1310	1360	nm	
Spectral Width (RMS)	Δλ	-	-	2.5	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	$P_{IN}$	-2	-	-	dBm	PRBS7, BER< $10^{-12}$
RX Sensitivity	$P_{IN}$	-	-	-23	dBm	PRBS7, BER< $10^{-12}$
Operating Center Wavelength	$\lambda_C$	1480	-	1500	nm	
Optical Return Loss	ORL	14	-	-	dB	$\lambda=1480\sim1500nm$
Optical Isolation	ISO	-	-	-45	dB	$\lambda=1260\sim1360nm$
LOS Asserted	$P_A$	-35	-	-	dBm	
LOS Deasserted	$P_D$	-	-	-23	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_LOSL	0	-	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOSH	2.4	-	$V_{CC}$	V	

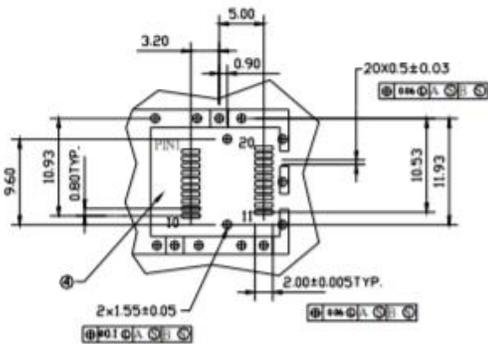
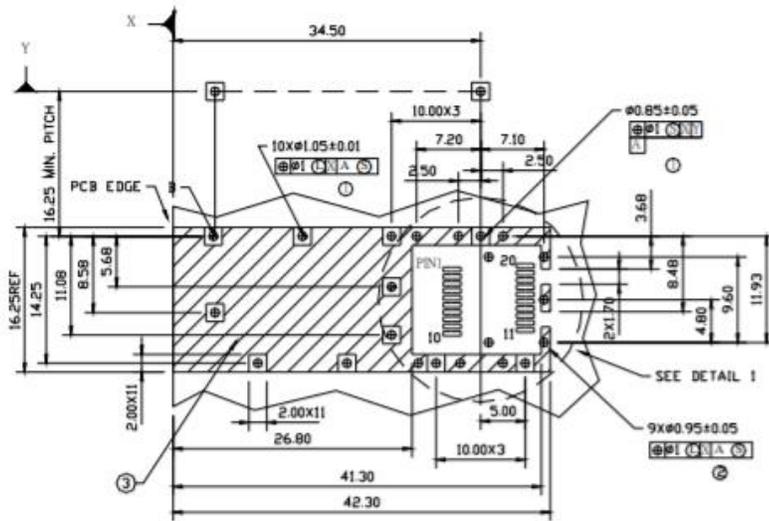
**DIMENSIONS**



**DIMENSIONS ARE IN MILLIMETERS**

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

SFP HOST BOARD MECHANICAL LAYOUT



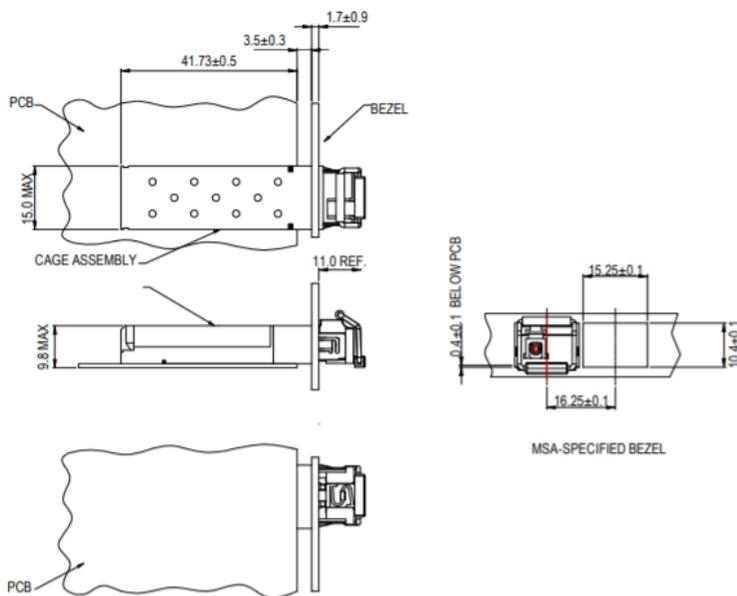
DETAIL 1

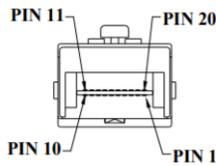
LEGEND

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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