



# 25Gbps TX:1270nm/RX:1310nm SMF 10km BiDi SFP28 LC Optical Transceiver

CS2T3-25GF-3S-Tx-L



## DESCRIPTION

The CS2T3-25GF-3S-Tx-L bi-directional SFP28 optical transceivers are designed for use in 25Gbps data rate and up to 10km link length over a single strand single-mode fiber. They are compliant with SFP+ MSA SFF-8431 and compatible with SFF-8432. The optical transceiver is RoHS compliant.

## FEATURES

- RoHS Compliant
- Compliant with SFP+ MSA SFF-8431
- Compliant with SFF8472 diagnostic monitoring interface
- Simplex LC connector
- Hot pluggable SFP28 footprint
- Single power supply 3.3V
- Link distance up to 10km over single mode fiber
- 1270nm DFB laser transmitter

## APPLICATIONS

- 25GBASE-LR / CPRI

## PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CS2T3-25GF-3S-TC-L	0°C to 70°C
CS2T3-25GF-3S-TM-L	-20°C to 85°C

**DIAGNOSTICS**

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Internal Transceiver Temperature	-20 to 85	±3	°C	Internal
Internal Transceiver Voltage	3.1 to 3.5	±0.1	V	
Bias Current	0 to 15	±10%	mA	
TX Power	-4 to +2	±3	dBm	
RX Average Power	-12 to +0	±3	dBm	

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX	UNIT
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	CS2T3-25GF-3S-TC-L
		-20	85		CS2T3-25GF-3S-TM-L
Supply Voltage	V <sub>CC</sub>	3.14	3.46	V	
Supply Current	I <sub>TX</sub> + I <sub>RX</sub>		300	mA	
Power Consumption	P	-	1.0	W	

**TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>c</sub> = 0°C to 70°C, -20°C to 85°C)**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Data Rate	B	24	25.78	26.5	Gbps	
Output Optical Power	P <sub>out</sub>	-4	-	+2	dBm	Average
Optical Modulation Amplitude	OMA	+1.2			dBm	
Extinction Ratio	ER	3.5			dB	
Center Wavelength	λ <sub>c</sub>	1260	1270	1280	nm	
Spectral Width (RMS)	Δλ	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Max. P <sub>out</sub> TX-DISABLE Asserted	P <sub>OFF</sub>	-	-	-45	dBm	
Differential Input Voltage	V <sub>DIFF</sub>	180		850	mV	
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	
TX_DISABLE Assert Time	t <sub>off</sub>	-	-	100	μs	
TX_DISABLE Negate Time	t <sub>on</sub>	-	-	2	ms	
Time to Initialize, include reset of TX_FAULT	t <sub>init</sub>	-	-	300	ms	
TX_FAULT from fault to assertion	t <sub>fault</sub>	-	-	1	ms	
TX_DISABLE Time to start reset	t <sub>reset</sub>	10	-	-	μs	

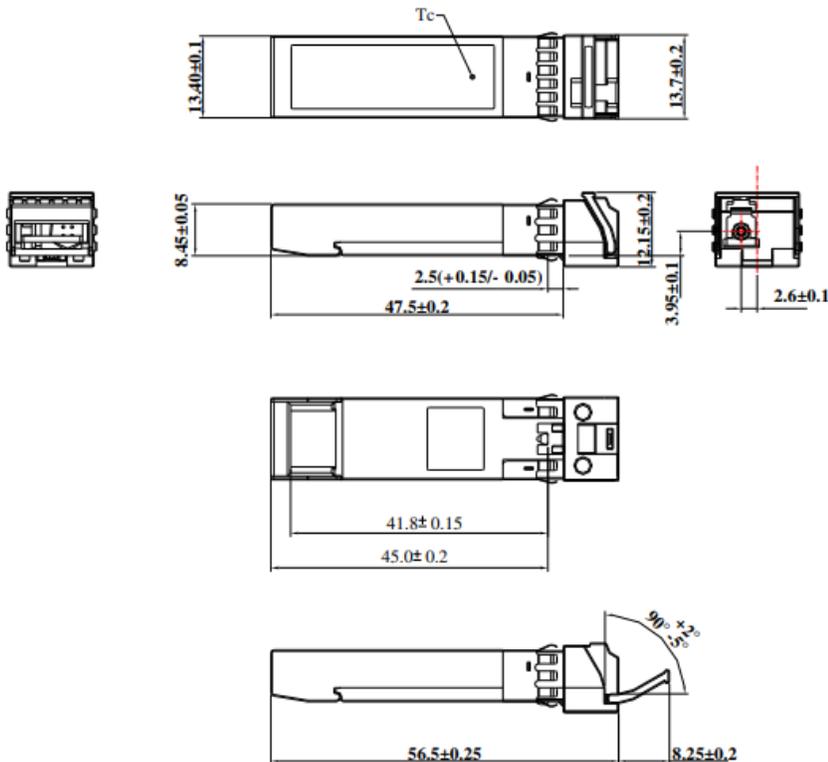
**RECEIVER ELECTRO-OPTICAL CHARACTERISTICS ( $V_{CC} = 3.1V$  to  $3.5V$ ,  $T_C = 0^{\circ}C$  to  $70^{\circ}C$ ,  $-20^{\circ}C$  to  $85^{\circ}C$ )**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Data Rate	B	24	25.78	26.5	Gbps	
Receiver Sensitivity	$P_{IN}$	-	-	-11.5	dBm	
Stressed Receiver Sensitivity (OMA)	$P_{IN}$	-	-	-6.8	dBm	
Operating Center Wavelength	$\lambda_C$	1300	-	1320	nm	
Optical Return Loss	ORL	14	-	-	dB	
Loss of Signal-Asserted	$P_A$	-25	-	-	dBm	
Loss of Signal-Deasserted	$P_D$	-	-	-12	dBm	
Differential Output Voltage	$V_{DIFF}$	300	-	800	mV	
Receiver Loss of Signal Output Voltage-Low	RX_LOSL	0	-	0.5	V	
Receiver Loss of Signal Output-High	RX_LOSH	2.4	-	$V_{CC}$	V	
Receiver Loss of Signal Assert Time (off to on)	$t_{A,RX\_LOS}$	-	-	100	$\mu s$	
Receiver Loss of Signal Assert Time (on to off)	$t_{D,RX\_LOS}$	-	-	100	$\mu s$	

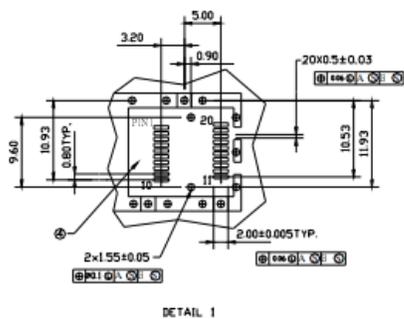
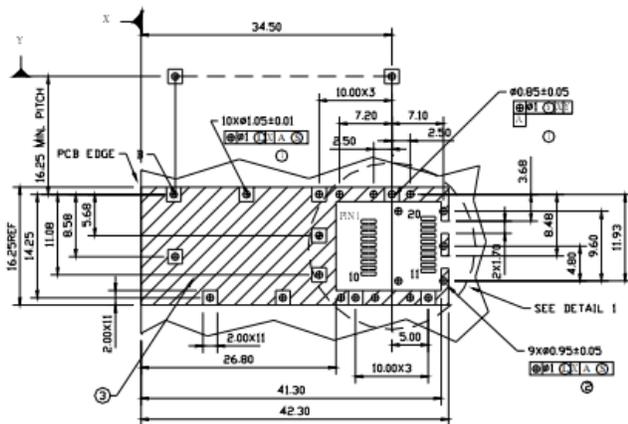
**I2C ELECTRICAL CHARACTERISTICS**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
High-Level Input Voltage SDA, SCL	$V_{IH}$	$0.7 * V_{CC}$	-	$V_{CC} + 0.3$	V	
Low-Level Input Voltage SDA, SCL	$V_{IL}$	-0.3	-	$0.3 * V_{CC}$	V	
SCL Clock Frequency	fSCL	0	-	400	kHz	
Serial Interface Clock Holdoff "Clock Stretching"	T_clock_hold	-	-	500	$\mu s$	

**DIMENSIONS (unit: mm)**



SFP HOST BOARD MECHANICAL LAYOUT



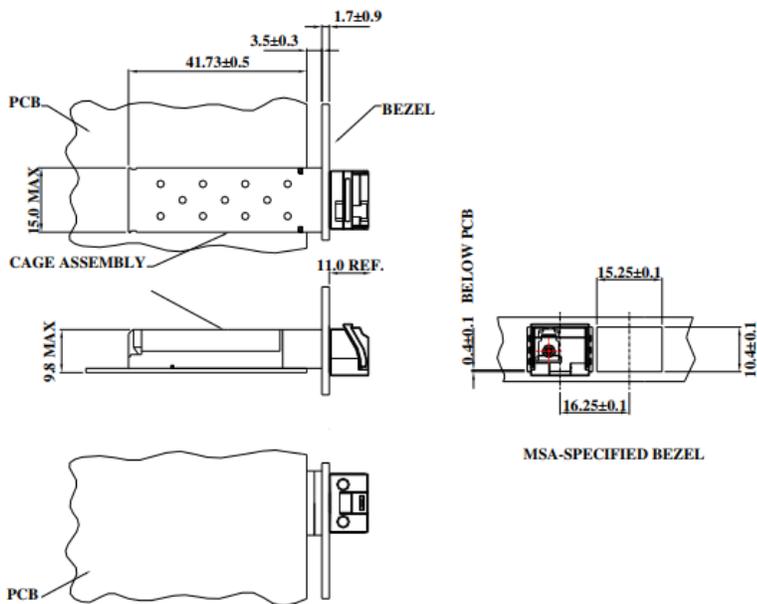
LEGEND

- 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

Unit: mm

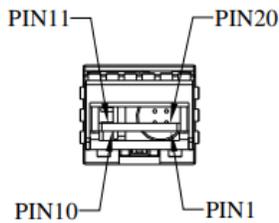
ASSEMBLY DRAWING



DIMENSIONS ARE IN MILLIMETERS

Unit: mm

## PIN ASSIGNMENT



Pin	Signal Name	Description
1	$T_{GND}$	Transmit Ground
2	$TX\_FAULT$	Transmit Fault
3	$TX\_DISABLE$	Transmit Disable
4	$SDA$	SDA Serial Data Signal
5	$SCL$	SCL Serial Clock Signal
6	$MOD\_ABS$	Internal connected to ground
7	$RS0$	Rate select 0, not used
8	$RX\_LOS$	Receiver Loss of Signal, LVTTTL High, open collector
9	$RS1$	Rate select 1, not used
10	$R_{GND}$	Receiver Ground
11	$R_{GND}$	Receiver Ground
12	$RX-$	Receive Data Bar, ac coupled
13	$RX+$	Receive Data, 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, ac coupled
19	$TX-$	Transmit Data Bar, 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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