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Data Sheet
Rev 01.1220

155Mbps TX:1550nm/RX:1490nm SMF 120km BiDi SFP LC Optical Transceiver

CS5T4-03H-3U-Tx-L

DESCRIPTION

The CS5T4-03H-3U-Tx-L bi-directional SFP (Small Form Pluggable) transceivers are designed for use in 155Mbps links up to 120km over a single strand single-mode fiber.

FEATURES

- SFF8472 diagnostic monitoring interface
- Industry standard small form pluggable (SFP) package
- Simplex LC connector
- Single power supply 3.3V
- Differential inputs and outputs
- TTL signal detect indicator
- Hot pluggable
- Class 1 laser product compliant with EN 60825-1
- Input/Ouput: AC/AC
- Signal Detect: LVTTL
- LD Type: 1550 DFB

APPLICATIONS

- Single-mode core fiber backbone links up to 120km
- Fast Ethernet

PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CS5T4-03H-3U-TC-L	0°C to 70°C
CS5T4-03H-3U-TI-L	-40°C to 85°C

DIAGNOSTICS

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Temperature	-40 to 95	±3	°C	External
Voltage	3.1 to 3.5	±0.1	V	
Bias Current	0 to 100	±10%	mA	
TX Power	-4 to +5	±3 dB	dBm	
RX Power	-31 to 0	±3 dB	dBm	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	-0.5	4.0	V	
Input Voltage	V_{IN}	-0.5	V_{CC}	V	

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Case Operating Temperature	T_C	0	70	°C	CS5T4-03H-3U-TC-L
		-40	85		CS5T4-03H-3U-TI-L
Supply Voltage	V_{CC}	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	-	300	mA	

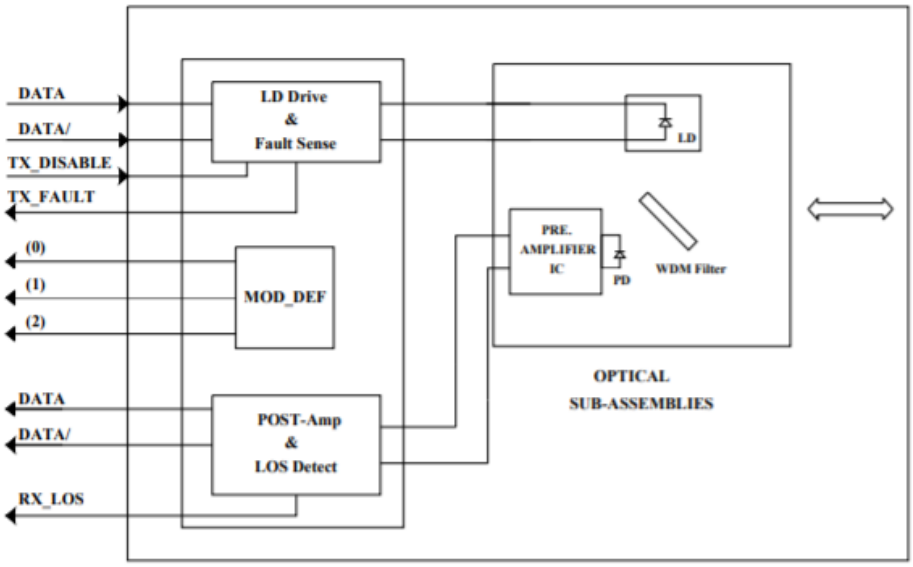
TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.1V to 3.5V, T_C = 0°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Output Optical Power 9/125um fiber	P_{out}	-2	-	+3	dBm	Average
Extinction Ratio	ER	9	-	-	dB	
Center Wavelength	λ_C	1540	1550	1560	nm	
Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Rise/Fall Time, 10%~90%	$T_{r,f}$	-	1	2	ns	
Output Eye	Compliant with Telcordia GR-253-CORE Issue 3 and ITU-T recommendation G-957					
Max. P_{out} TX-DISABLE Asserted	P_{OFF}	-	-	-45	dBm	
Differential Input Voltage	V_{DIFF}	0.4	-	2.0	V	

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.1V to 3.5V, T_C = 0°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Optical Input Power-Maximum	P_{IN}	0	-	-	dBm	BER<10^{-10}
Optical Input Power-Minimum (Sensitivity)	P_{IN}	-	-	-34	dBm	BER<10^{-10}
Operating Center Wavelength	λ_C	1480	-	1500	nm	
Optical Return Loss	ORL	14	-	-	dB	λ=1480~1500nm
Loss of Signal-Asserted	P_A	-	-	-34	dBm	
Loss of Signal-Deasserted	P_D	-45	-	-	dBm	
Differential Output Voltage	V_{DIFF}	0.5	-	1.2	V	
Data Output Rise/Fall Time, 10%~90%	$T_{r,f}$	-	1	2	ns	
Receiver Loss of Signal Output Voltage-Low	RX_LOS_L	0	-	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOS_H	2.4	-	V_{CC}	V	

BLOCK DIAGRAM OF TRANSCEIVER

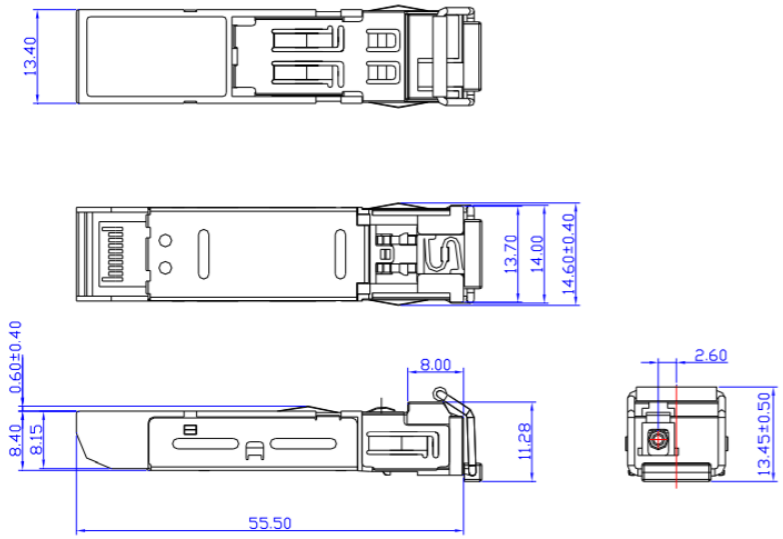


Transmitter and Receiver Optical Sub-Assembly Section - A 1550 nm InGaAsP laser and an InGaAs PIN photodiode integrate with an WDM filter to form a bi-directional single fiber optical subassembly (OSA). The laser of OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into an analog laser driving current. The photodiode of OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

TX_DISABLE - The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output.

Receive Loss (RX_LOS) - The RX_LOS is high (logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

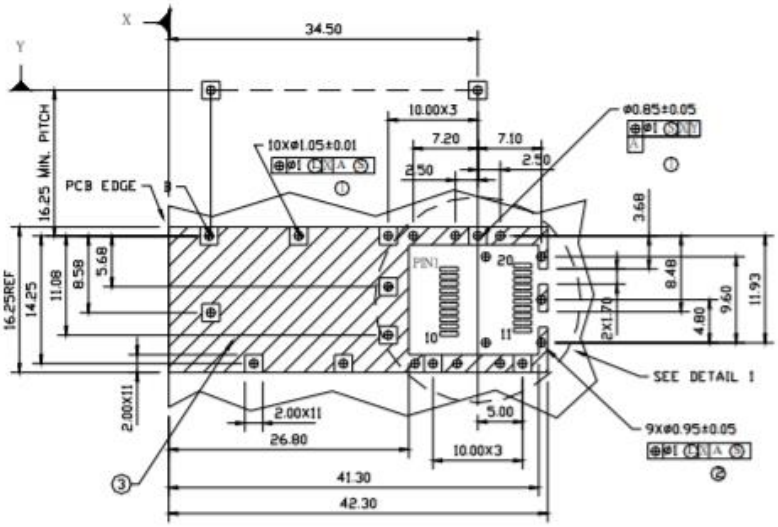
DIMENSIONS

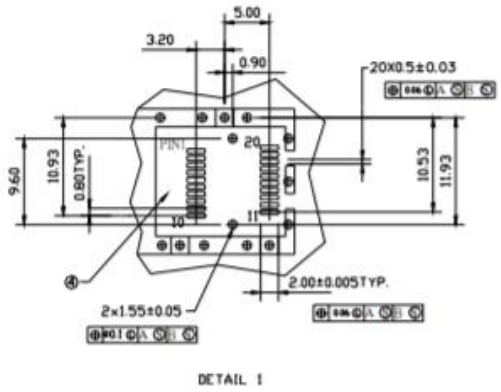


DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE ± 0.2mm UNLESS OTHERWISE SPECIFIED

SFP HOST BOARD MECHANICAL LAYOUT





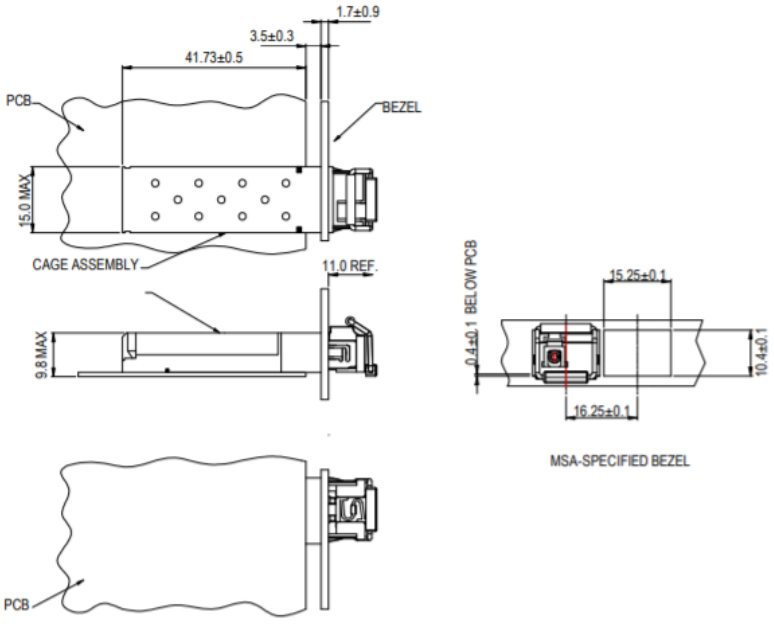
DETAIL 1

LEGEND

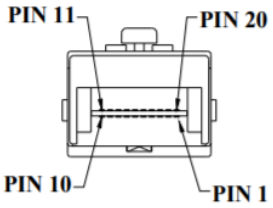
1.PADS AND VIAS ARE CHASSIS GROUND
2.THROUGH HOLES, PLATING OPTIONAL
3.HATCHED AREA DENOTES COMPONENT AND TRACE KEEPOUT(EXCEPT CHASSIS GROUND)
4.AREA DENOTES COMPONENT KEEPOUT (TRACES ALLOWED)

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 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.

[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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