



## **1.25Gbps TX:1570nm/RX:1510nm SMF 120km BiDi SFP SC Optical Transceiver (Commercial)**

**CS7T5-24H-3U-TC-C**



### **DESCRIPTION**

The CS7T5-24H-3U-TC-C is a high-performance 1.25Gbps BiDi SFP transceiver designed for Gigabit Ethernet applications over singlemode fiber (SMF). It features a 1570nm transmit and 1510nm receive wavelength configuration, enabling point-to-point communication up to 120 kilometers. Equipped with a simplex SC connector and compliant with commercial temperature ranges, this module is ideal for extended-distance data transmission in fiber networks where space and cost efficiency are key.

### **FEATURES**

- Industry standard small form pluggable (SFP) package
- Simplex SC connector
- Single power supply 3.3V
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable
- Class 1 laser product compliant with EN 60825-1
- Temperature: 0°C to 70°C
- LD Type: 1570 DFB

### **APPLICATIONS**

- Single-mode core fiber backbone links up to 120km
- 1000Base Bidi

## DIAGNOSTICS

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Temperature	-40 to 95	±3	°C	External
Voltage	0 to V <sub>CC</sub>	±0.1	V	
Bias Current	0 to 120	±5	mA	
TX Power	-5 to +6	±3 dB	dBm	
RX Power	-28 to -10	±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	
Supply Voltage	V <sub>CC</sub>	3.1	3.5	V	
Supply Current	I <sub>TX</sub> + I <sub>RX</sub>		300	mA	

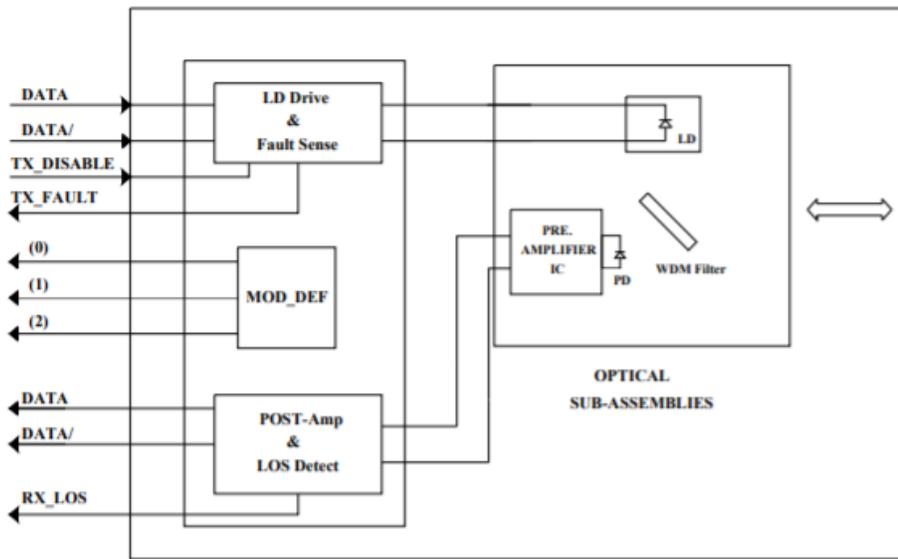
TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V<sub>CC</sub> = 3.1V to 3.5V, T<sub>C</sub> = 0°C to 70°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Output Optical Power 9/125um fiber	P <sub>out</sub>	-2	-	+3	dBm	Average
Extinction Ratio	ER	9	-	-	dB	
Center Wavelength	λ <sub>c</sub>	1560	1570	1580	nm	
Spectral Width (-20dB)	Δλ	-	-	0.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
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	

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

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Optical Input Power-Maximum	P <sub>IN</sub>	-8	-	-	dBm	BER<10 <sup>-12</sup>
Optical Input Power-Minimum (Sensitivity)	P <sub>IN</sub>	-	-	-33	dBm	BER<10 <sup>-12</sup>
Operating Center Wavelength	λ <sub>c</sub>	1500	-	1520	nm	
Optical Return Loss	ORL	14	-	-	dB	λ=1500~1520nm
Optical Isolation	ISO	-	-	-40	dB	λ=1560~1580nm
Signal Detect-Asserted	P <sub>A</sub>	-	-	-33	dBm	
Signal Detect-Deasserted	P <sub>D</sub>	-45	-	-	dBm	
Differential Output Voltage	V <sub>DIFF</sub>	0.5	-	1.2	V	
Data Output Rise, Fall Time (20%~80%)	T <sub>r, f</sub>	-	-	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 <sub>CC</sub>	V	

**BLOCK DIAGRAM OF TRANSCEIVER**

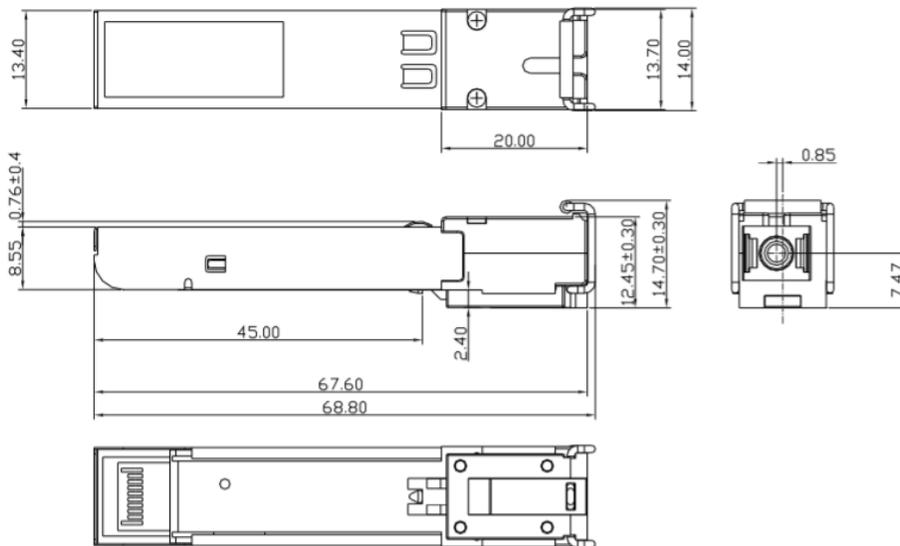


**Transmitter and Receiver Optical Sub-Assembly Section** - A 1570 nm InGaAsP laser and an APD photodiode integrate with an WDM filter to form a bi-directional single fiber optical subassembly (OSA). The laser of OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into 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**



**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.

**Required Mark**

Class 1 Laser Product  
Complies with  
21 CFR 1040.10 and 1040.11

**[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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