



2.5Gbps TX:1550nm/RX:1490nm SMF 120km BiDi SFP LC Optical Transceiver (Commercial)

CS5T4-48H-3U-TC-L



DESCRIPTION

The CS5T4-48H-3U-TC-L is a high-performance 2.5Gbps BiDi SFP optical transceiver designed for single-mode fiber (SMF) communications up to 120km. Utilizing 1550nm for transmit (TX) and 1490nm for receive (RX), this module features an LC connector and offers reliable performance for long-distance commercial applications in networking and telecommunications.

FEATURES

- Telecordia GR-253-GORE and ITU-T Recommendation G.957 application
- Industry standard small form pluggable (SFP) package
- Simplex LC connector
- Single power supply 3.3V
- Hot pluggable
- TTL signal detect indicator
- Class 1 laser product compliant with EN 60825-1
- Input/Output: AC/AC
- LOS: LVTTL
- LD Type: 1550 DFB
- Temperature: 0°C to 70°C

APPLICATIONS

- Single-mode core fiber backbone links up to 120km
- 2500M / OC48 / STM-16

DIAGNOSTICS

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Module Internal Temperature	-10 to 80	±3	°C	Internal
Module Internal Voltage	3.1 to 3.5	±0.1	V	
Bias Current	0 to 100	±10%	mA	
TX Power	-3.5 to +6.5	±3 dB	dBm	
RX Power	-29.5 to -9	±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	
Optical Input Power	P_{in}	-	-8	dBm	@1490nm

RECOMMENDED OPERATING CONDITIONS

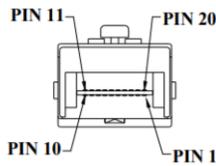
PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Case Operating Temperature	T_C	0	70	°C	
Supply Voltage	V_{CC}	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	-	300	mA	
Optical Path Loss	Loss	12.5~29		dB	
Optical Fiber		ITU-T G.652 (SMF)			
Distance	D		120	km	
Optical Path Dispersion Penalty			2.5	dB	
Dispersion Tolerance			2400	ps/nm	

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

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Bit Rate	B	622	-	2670	Mbps	
Output Optical Power 9/125um fiber	P_{out}	-0.5	-	+3.5	dBm	Average
Extinction Ratio	ER	6	-	-	dB	
Center Wavelength	λ_c	1540	1550	1560	nm	
Spectral Width (-20dB)	$\Delta\lambda$	-	-	0.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN	-	-	-120	dB/Hz	
Output Rise/Fall Time (20~80%)	$T_{r,f}$	-	-	160	ps	
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 $3.5V$, $T_C = 0^\circ C$ to $70^\circ C$)

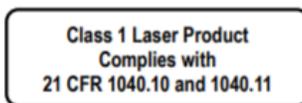
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Bit Rate	B	622	-	2670	Mbps	
Optical Input Power-Maximum	P_{IN}	-9	-	-	dBm	$BER < 10^{-10}$
Optical Input Power-Minimum (Sensitivity)	P_{IN}	-	-	-29.5	dBm	$BER < 10^{-10}$ 2670Mbps
Operating Center Wavelength	λ_c	1480	-	1500	nm	
Optical Return Loss	ORL	14	-	-	dB	$\lambda = 1480 \sim 1500nm$
LOS Asserted	P_A	-45	-	-	dBm	
LOS Deasserted	P_D	-	-	-29.5	dBm	
Differential Output Voltage	V_{DIFF}	0.5	-	1.2	V	
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	

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.

Required Mark

[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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