



10GBASE-LW/LR 10G Ethernet 1310nm SMF Mini SFF Optical Transceiver

CS13-10GM-3L-TI



Description

The CS13-10GM-3L-TI transceivers provide products for maximum bandwidth of 10Gbps and transmission up to 6.6dB margin. The transceiver is provided in mini SFF with duplex LC connector interface.

Features

- Single power supply 3.3V
- Duplex LC optical connection
- Class 1 laser product compliant with EN 60825-1
- Input/Output: AC/AC
- Industrial temperature range -40°C to 85°C

Applications

- Single mode core fiber backbone links up to 6.6dB margin
- 10GBASE-LW/LR Ethernet

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Internal Transceiver Temperature	-40 to 95	±3	°C	Internal
Internal Transceiver Voltage	3.0 to 3.6	±0.1	V	
Bias Current	0 to 15	±10%	mA	
TX Power	-9 to +2	±3	dB	
RX Average Power	-16 to 0	±3	dB	

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	-40	85	°C	
Supply Voltage	V _{CC}	3.14	3.46	V	
Supply Current	I _{TX} + I _{RX}		300	mA	
Power Consumption	P	-	1.0	W	

Transmitter Electro-Optical Characteristics (V_{CC} = 3.14V to 3.46V, T_C = -40°C to 85°C)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	B	10.3125			Gbps	
Output Optical Power	P _{out}	-6	-	0.5	dBm	
Optical Modulation Amplitude	OMA	-5.2			dBm	
Extinction Ratio	ER	3.5			dB	
Center Wavelength	λ _C	1290	1310	1330	nm	
Spectral Width (RMS)	Δλ	-	-	1	nm	
Side Mode Suppression Ratio	SSR _{min}	30			dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Output Eye	Compliant with IEEE802.3ae					
Max. P _{out} TX-DISABLE Asserted	P _{OFF}	-	-	-35	dBm	
Differential Input Impedance	Z _d	75	100	125	Ω	
Differential Input Voltage Swing	V _{DIFF}	200		800	mV	
TX_DISABLE Assert Time	t _{off}	-	-	100	μs	
TX_DISABLE Negate Time	t _{on}	-	-	2	ms	
Time to Initialize	t _{init}	-	-	300	ms	
TX_DISABLE Time to start reset	t _{reset}	10	-	-	μs	

Receiver Electro-Optical Characteristics (V_{CC} = 3.14V to 3.46V, T_C = -40°C to 85°C)

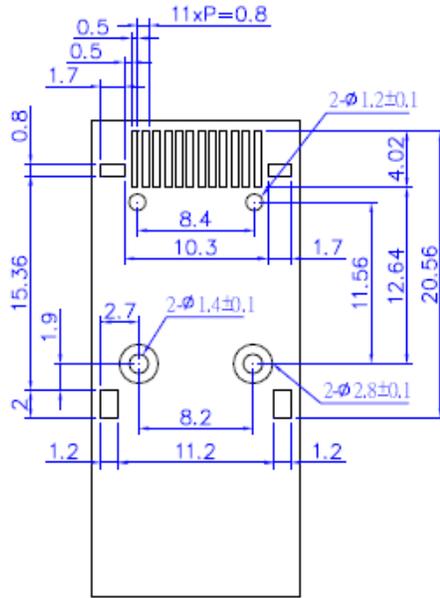
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	B	10.3125			Gbps	
Optical Input Power-Maximum	P _{IN}	0.5	-	-	dBm	BER<10 ⁻¹²
Receiver Sensitivity (OMA)	P _{IN}	-	-	-12.6	dBm	BER<10 ⁻¹²
Operating Center Wavelength	λ _C	1260	-	1355	nm	
Optical Return Loss	ORL	12	-	-	dB	
Loss of Signal-Asserted	P _A	-30	-	-	dBm	Note 1
Loss of Signal-Deasserted	P _D	-	-	-15	dBm	Note 1
Differential Output Impedance	Z _d	75	100	125	Ω	
Differential Output Voltage	V _{DIFF}	300	-	800	mV	

Note:

- The LOS state is monitored and defined at SFF-8472 byte 110 bit 1.

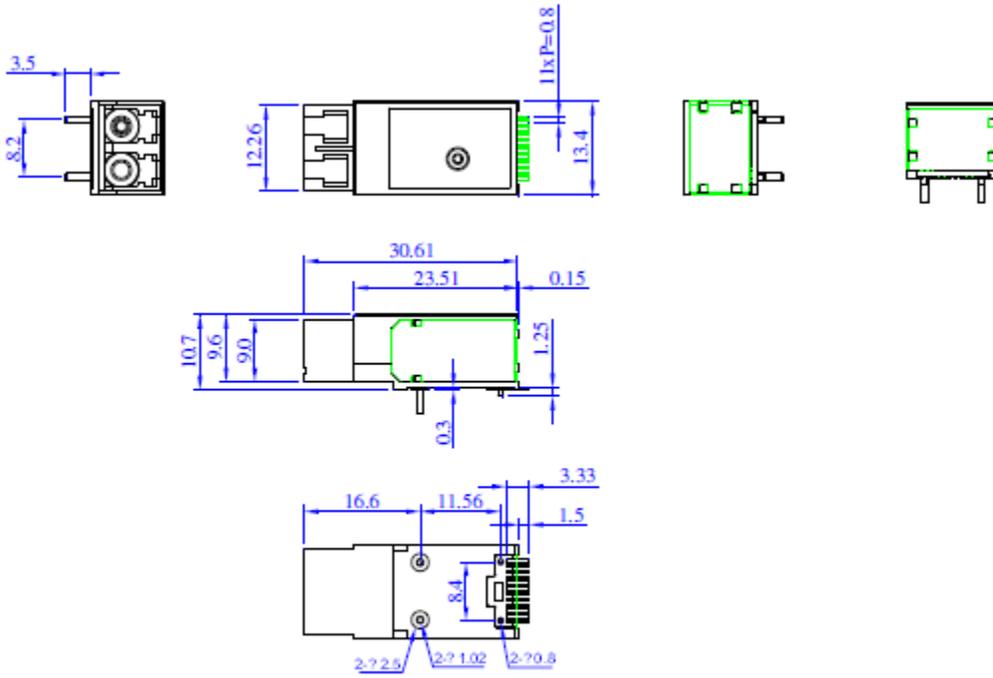
Recommended Host Board Mechanical Layout

PCB Design Guidelines



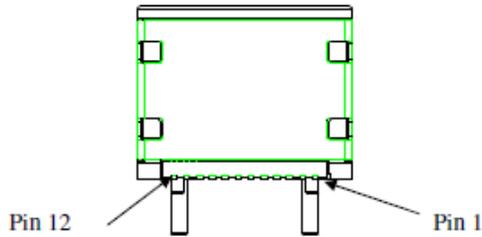
Unit: mm

Dimensions



Unit: mm

Pin Assignment



PIN	SIGNAL NAME	DESCRIPTION
1	GND	Ground
2	TX+	Transmit Data in, ac coupled
3	TX-	Transmit Data in Bar, ac coupled
4	GND	Ground
5	TX_DISABLE	Transmit Disable
6	V _{CC}	3.3V Power Supply
7	MOD_DEF (2)	SDA Serial Data Signal
8	MOD_DEF (1)	SCL Serial Clock Signal
9	GND	Ground
10	RX-	Receive Data out Bar, ac coupled
11	RX+	Receive Data out, ac coupled
12	GND	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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