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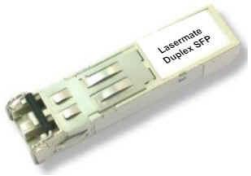
Data Sheet
Rev 01.1220

155Mbps 1310nm MMF 2km SFP Optical Transceiver with Duplex LC Connector

CM13L-03F-3S-Tx-L



DESCRIPTION

The CM13L-03F-3S-Tx-L duplex SFP (Small Form Pluggable) optical transceivers are high performance, cost effective optical transceiver modules for serial optical data communications application specified for a data rate of 155 Mb/s. The SFP transceiver module provides 2km transmission distance over multi-mode fiber at nominal wavelength of 1310nm. The optical transceiver is RoHS compliant.

FEATURES

- RoHS compliant
- Compliant with Fast ethernet standard
- Compatible with SONET/SDH application
- Industry standard small form pluggable (SFP) package
- Hot pluggable
- Single power supply 3.3V
- Duplex LC optical connection
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Class 1 laser product compliant with EN 60825-1
- Input/Output: AC/AC
- Up to 2km over multimode fiber

APPLICATIONS

- Distributed multi-processing
- Switch to switch interface
- High speed I/O for file server
- Bus extension application
- Channel extender, data storage
- Fast Ethernet / OC3

PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CM13L-03F-3S-TC-L	-10°C to 70°C
CM13L-03F-3S-TI-L	-40°C to 85°C

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
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
Output Current	I_o	-	50	mA
Operating Current	I_{OP}	-	400	mA

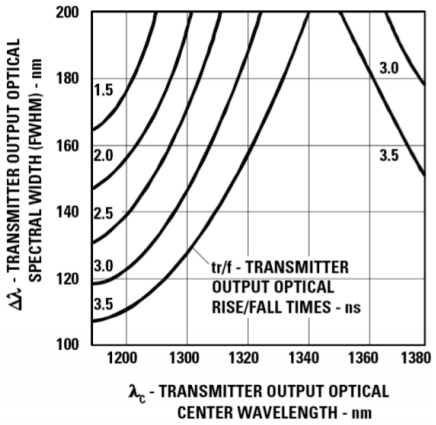
RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Case Operating Temperature	T_C	-10	70	°C	CM13L-03F-3S-TC-L
		-40	85		CM13L-03F-3S-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 = -10°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Data Rate	B	10	155	200	Mbps
Average Output Optical Power 62.5/125um fiber	P_{out}	-20	-	-14	dBm
Average Output Optical Power 50/125um fiber	P_{out}	-23.5	-	-14	dBm
Extinction Ratio	ER	10	-	-	dB
Center Wavelength	λ_C	1270	1310	1380	nm
Spectral Width (FWHM)	$\Delta\lambda$		Fig 1		nm
Rise/Fall Time (10~90%)	$T_{r,f}$	-	-	3	ns
Differential Input Voltage	V_{DIFF}	0.4	-	2.0	V

Figure 1 – LED spectral width limit

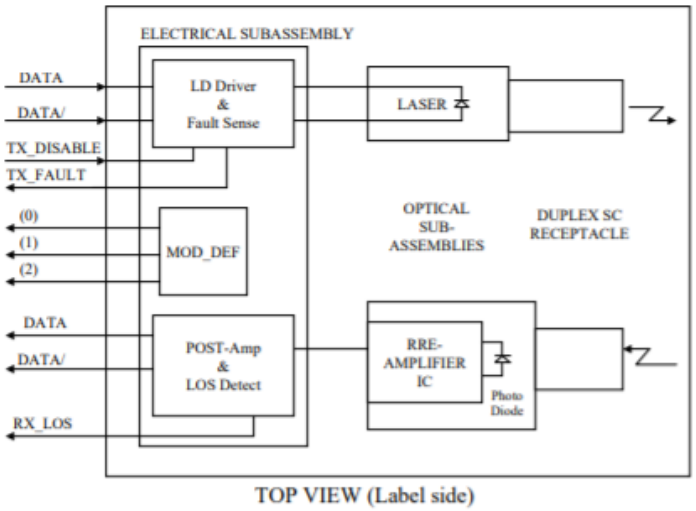


RECEIVER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.1V to 3.5V, T_C = -10°C to 70°C, -40°C to 85°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Data Rate	B	10	155	200	Mbps	
Optical Input Power-Maximum	P_{IN}	-8	-	-	dBm	Note 1
Receiver Input Power-Minimum (Sensitivity)	P_{IN}	-	-	-31	dBm	Note 1
Operating Center Wavelength	λ_C	1260	-	1600	nm	
Loss of Signal-Asserted	P_A	-	-	-32	dBm	Average
Loss of Signal-Deasserted	P_D	-47	-	-	dBm	Average
Loss of Signal-Hysteresis	P_A-P_D	0.5	-	-	dB	
Data Output Rise, Fall time (10~90%)	$T_{r,f}$	-	1	2	ns	
Differential Output Voltage	V_{DIFF}	0.5	-	1.8	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	

Note 1: The input data is at 155.52 Mbps, 223−1 PRBS data pattern with 72 “1”s and 72 “0”s inserted per the ITU-T recommendation G.958 Appendix 1. The receiver is guaranteed to provide output data with Bit Error Rate (BER) better than or equal to 1 × 10–10.

BLOCK DIAGRAM OF TRANSCEIVER



TOP VIEW (Label side)

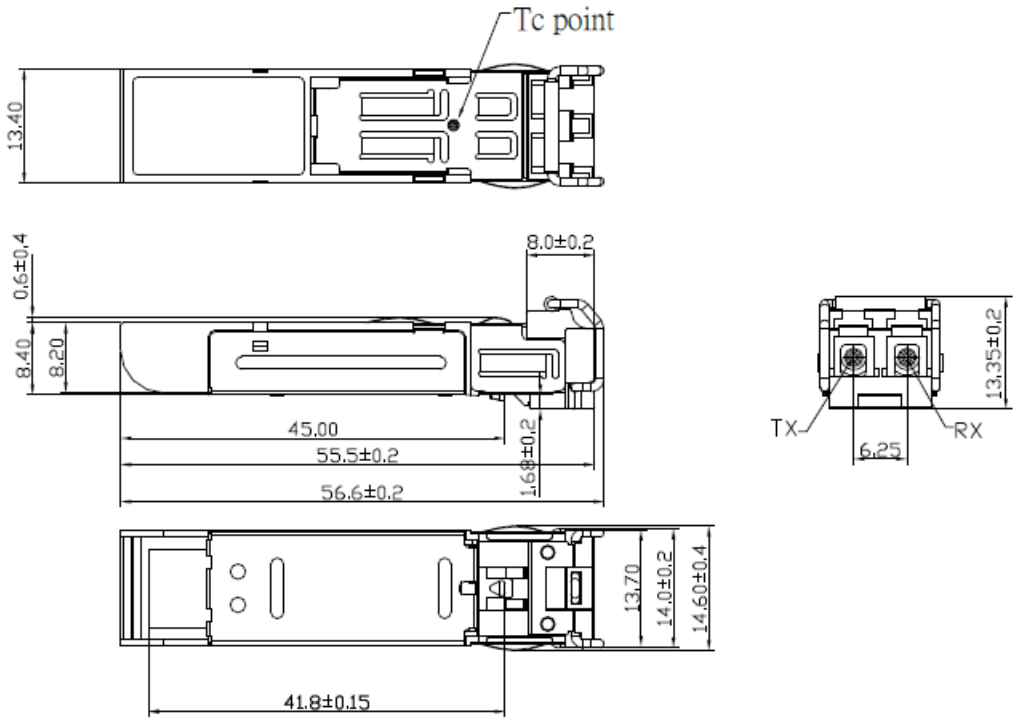
Transmitter Section - The transmitter section consists of a 1310 nm LED in an eye safe optical subassembly (OSA) which mates to the fiber cable. The laser OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into an analog laser driving current.

TX_DISABLE - The TX_DISABLE signal is high (TTL logic “1”) to turn off the laser output. The laser will turn on when TX_DISABLE is low (TTL logic “0”).

Receiver Section - The receiver utilizes an InGaAs PIN photodiode mounted together with a trans-impedance preamplifier IC in an OSA. This OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

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

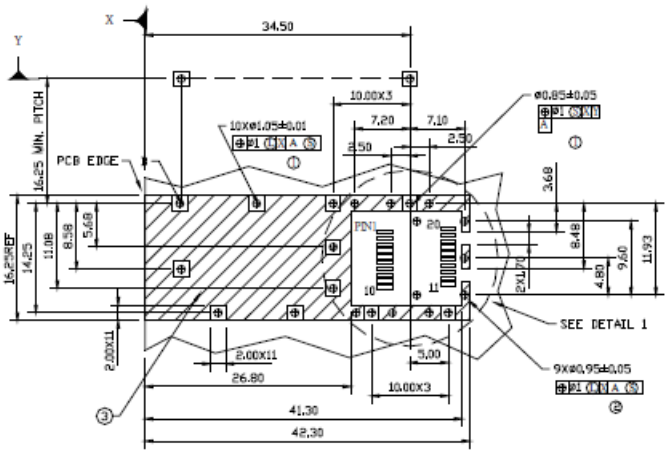


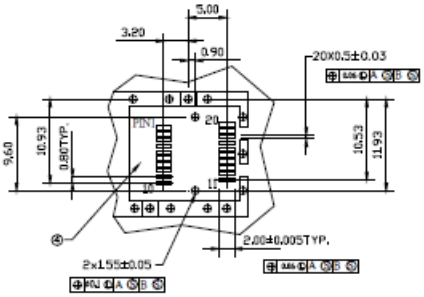
DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE ± 0.1mm UNLESS OTHERWISE SPECIFIED

Unit: mm

SFP HOST BOARD MECHANICAL LAYOUT





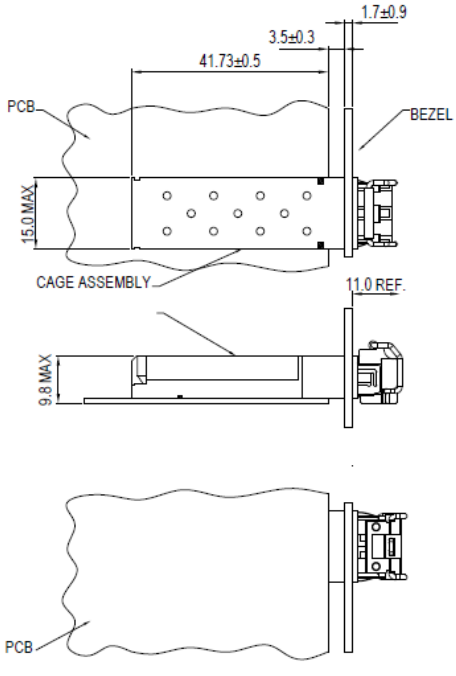
DETAIL 1

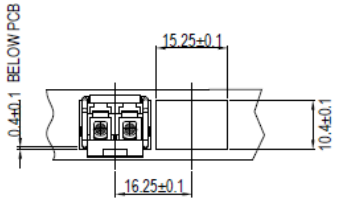
LEGEND

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



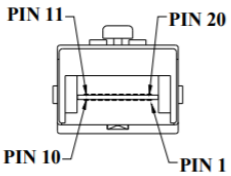


MSA-SPECIFIED BEZEL

DIMENSIONS ARE IN MILLIMETERS

Unit: mm

PIN ASSIGNMENT



PIN	SIGNAL NAME	DESCRIPTION	PIN	SIGNAL NAME	DESCRIPTION
1	T_{GND}	Transmit Ground	11	R_{GND}	Receiver Ground
2	TX_FAULT	Transmit Fault	12	RX-	Receive Data Bar, Differential, ac coupled
3	TX_DISABLE	Transmit Disable	13	RX+	Receive Data, Differential, ac coupled
4	MOD_DEF (2)	SDA Serial Data Signal	14	R_{GND}	Receiver Ground
5	MOD_DEF (1)	SCL Serial Clock Signal	15	V_{CCR}	Receiver Power Supply
6	MOD_DEF (0)	TTL Low	16	V_{CCT}	Transmitter Power Supply
7	RATE SELECT	Open Circuit	17	T_{GND}	Transmitter Ground
8	RX_LOS	Receiver Loss of Signal, TTL High, open collector	18	TX+	Transmit Data, Differential, ac coupled
9	R_{GND}	Receiver Ground	19	TX-	Transmit Data Bar, Differential, ac coupled
10	R_{GND}	Receiver Ground	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.

www.lasermate.com

Lasermate Group, Inc.
19608 Camino De Rosa
Walnut, CA 91789 USA
Tel: (909)718-0999
Fax: (909)718-0998
sales@lasermate.com
www.lasermate.com