



**RoHS compliant**  
**TX-1270/RX-1330 nm Single-mode Bi-directional , 40km**  
**SFP LC Simplex Connector**  
**10.3125Gbps**

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### Features

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- 10.3125Gbps application
- Compliant with SFF 8432 SFP+ Module
- Simplex LC connector
- Single power supply 3.3V
- LVTTTL signal detect indicator
- Hot Pluggable
- Class 1 laser product complies with EN 60825-1
- Reliability compliant with Telcordia (Bellcore) GR-468-CORE



### Ordering Information

PART NUMBER	TX/RX	TEMPERATURE	LD Type	Distance
LG38-H3L-TC-N27	1270/1330	0°C to 70 °C	1270 DFB	40km <sub>(Note)</sub>
LG38-H3L-TI-N27	1270/1330	-40°C to 85 °C	1270 DFB	40km <sub>(Note)</sub>

Note: Attenuation of 0.40 dB/km @1270nm is used for the link length calculations



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### Diagnostics

Parameter	Range	Accuracy	Calibration
Internal Transceiver Temperature	-45 to 95 °C	± 3 °C	Internal
Internal Transceiver Voltage	3.1 to 3.5 V	± 0.1 V	
Bias Current	0 to 100 mA	± 10 %	
TX Power	+2 to +6 dBm	± 3 dB	
RX average Power	-15 to 0 dBm	± 3 dB	

### Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
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	UNITS	NOTE
Case Operating Temperature	$T_C$	0	70	°C	For TC type
		-40	85	°C	For TI type
Supply Voltage	$V_{CC}$	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	300	mA	For TC type
		---	350		For TI type
Fiber	SMF(G.652)				
Distance	$D$	---	40	km	
Dispersion penalty			1	dB	@40km



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**Transmitter Electro-optical Characteristics**

$V_{CC} = 3.1\text{ V to }3.5\text{ V}$ , For TC type :  $T_C = 0^\circ\text{C to }70^\circ\text{C}$ , For TI type :  $T_C = -40^\circ\text{C to }85^\circ\text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Bit Rate	$B$	---	10.3125	---	Gbps	
Output Optical Power	$P_{out}$	+2	---	+6	dBm	Average
Extinction Ratio	$ER$	6	---	---	dB	
Center Wavelength	$\lambda_c$	1260	1270	1280	nm	
Spectral Width (-20dB)	$\Delta\lambda$	---	---	0.5	nm	
Side Mode Suppression Ratio	$SMSR$	30			dB	
Max. $P_{out}$ TX-DISABLE Asserted	$P_{OFF}$	---	---	-45	dBm	
Differential Input Voltage	$V_{DIFF}$	180		850	mV	
Transmit Fault Output-Low	$TX\_FAULT_L$	0.0	---	0.5	V	
Transmit Fault Output-High	$TX\_FAULT_H$	2.4	---	$V_{CC}$	V	
TX_DISABLE Assert Time	$t_{off}$	---	---	100	$\mu s$	
TX_DISABLE Negate Time	$t_{on}$	---	---	2	ms	
Time to initialize, include reset of TX_FAULT	$t_{init}$	---	---	300	ms	
TX_FAULT from fault to assertion	$t_{fault}$	---	---	100	$\mu s$	
TX_DISABLE time to start reset	$t_{reset}$	10	---	---	$\mu s$	



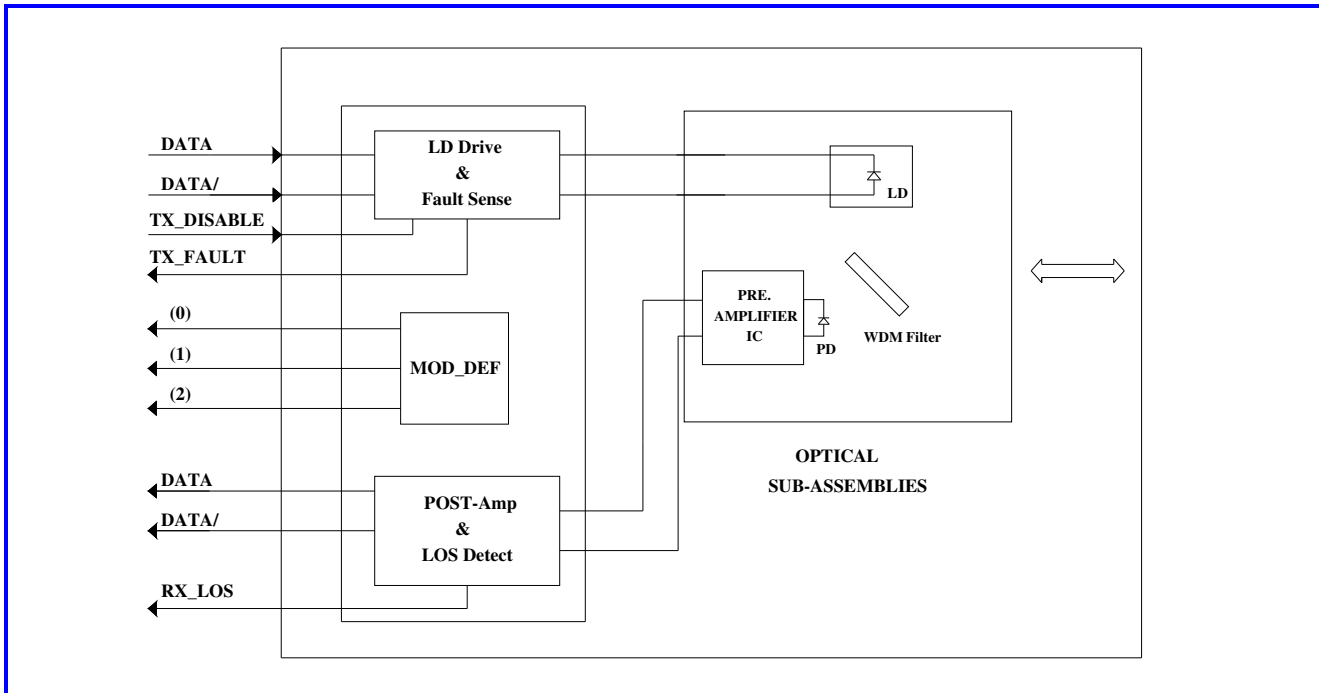
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**Receiver Electro-optical Characteristics**

$V_{CC} = 3.1\text{ V to }3.5\text{ V}$ , For TC type :  $T_C = 0^\circ\text{C to }70^\circ\text{C}$ , For TI type :  $T_C = -40^\circ\text{C to }85^\circ\text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Bit Rate	$B$	---	10.3125	---	Gbps	
Optical Input Power-maximum	$P_{IN}$	0	---	---	dBm	BER < $10^{-12}$
Optical Input Power-minimum (Sensitivity)	$P_{IN}$	---	---	-15	dBm	BER < $10^{-12}$
Operating Center Wavelength	$\lambda_C$	1320	---	1340	nm	
Optical Return Loss	$ORL$	14	---	---	dB	
Loss of signal -Deasserted	$P_D$	---	---	-15	dBm	
Loss of signal -Asserted	$P_A$	-30	---	---	dBm	
Differential Output Voltage	$V_{DIFF}$	350	---	850	mV	
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	
Receiver Loss of Signal Assert Time (off to on)	$t_{A,RX\_LOS}$	---	---	100	$\mu s$	
Receiver Loss of Signal Assert Time (on to off)	$t_{D,RX\_LOS}$	---	---	100	$\mu s$	

### Block Diagram of Transceiver



#### Transmitter and Receiver Optical Sub-assembly Section

A 1270 nm InGaAsP laser and an InGaAs PIN photodiode integrate with a 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 signals into an analog laser driving current. And, the photodiode of OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

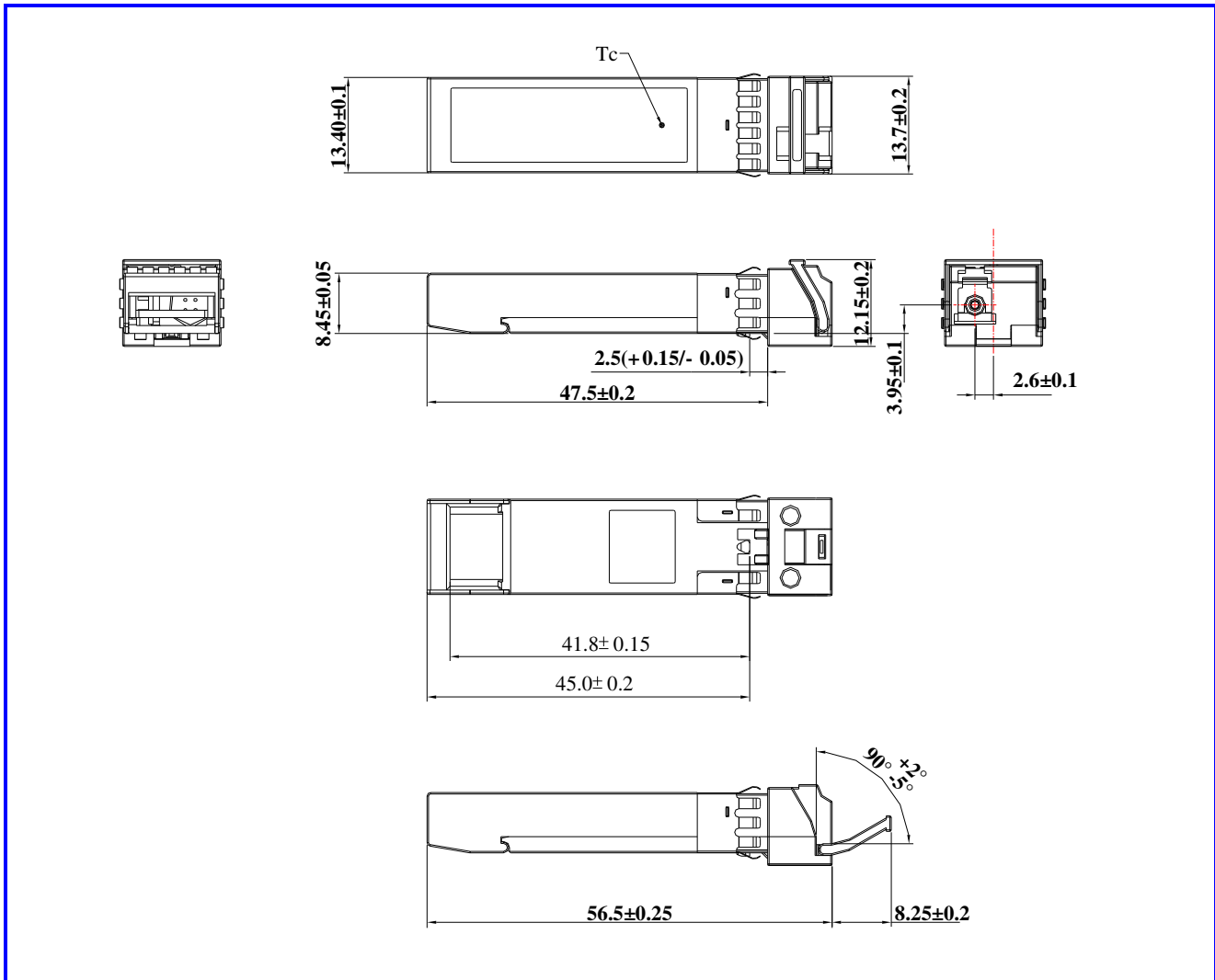
#### TX\_DISABLE

The TX\_DISABLE signal is high (TTL logic “1”) to turn off the laser output.

#### Receive Loss (RX\_LOS)

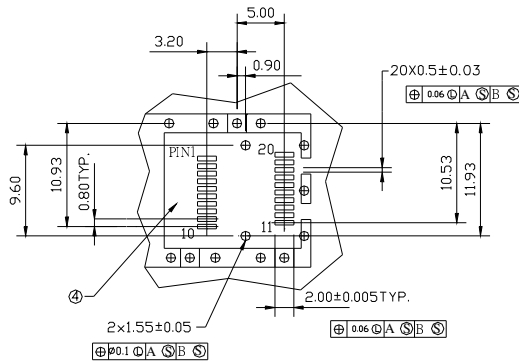
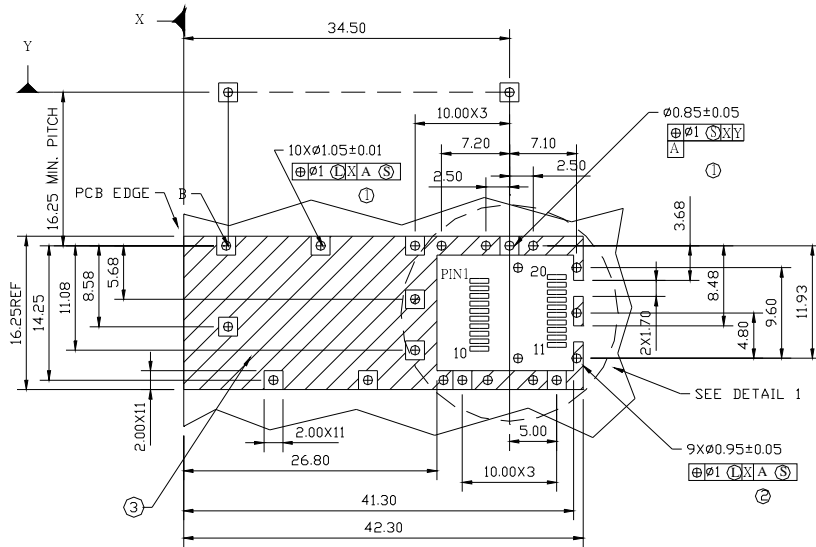
The RX\_LOS is high (logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

### Dimensions



Latch color: Blue

SFP host board mechanical layout



DETAIL 1

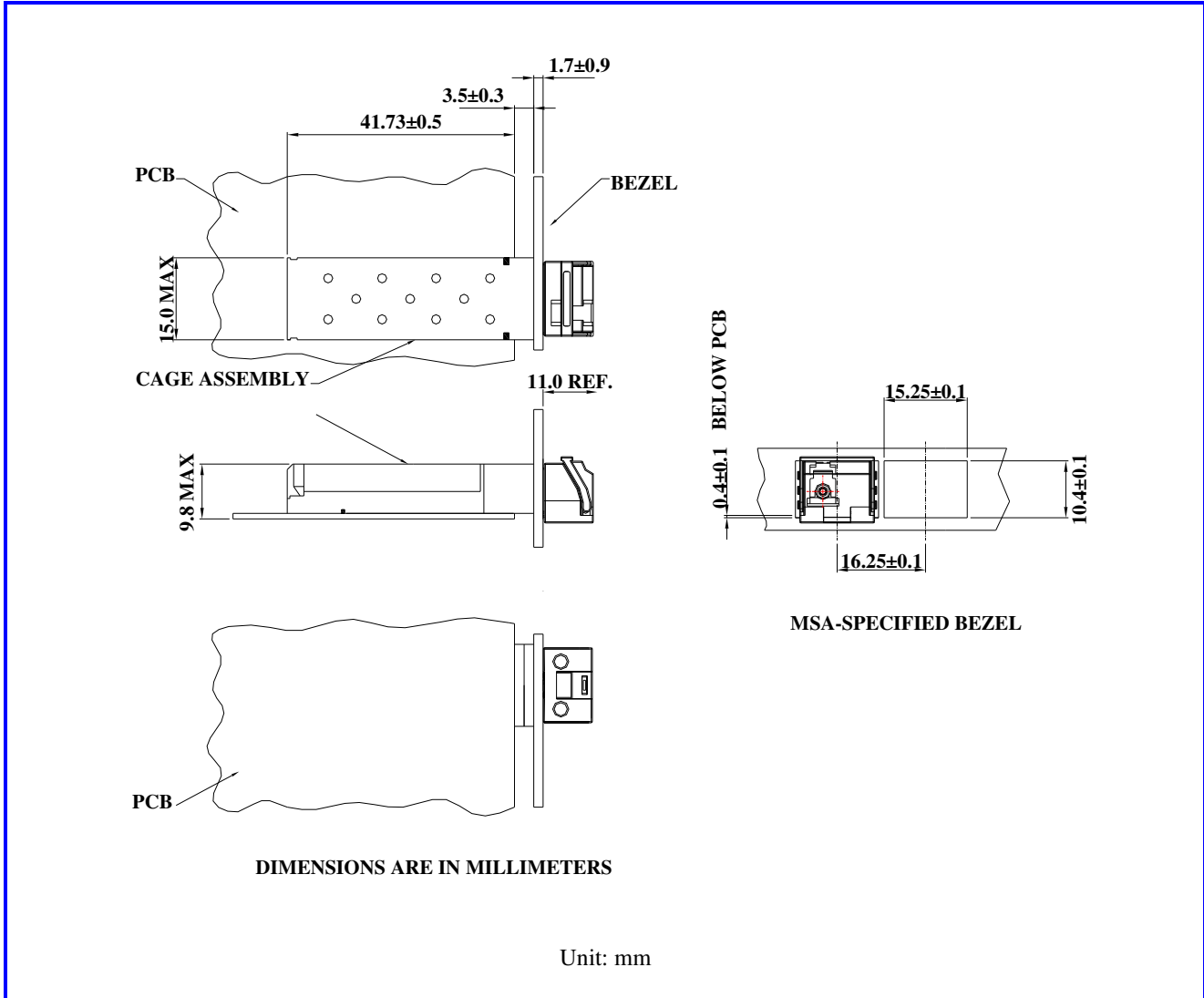
LEGEND

- 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

Unit: mm

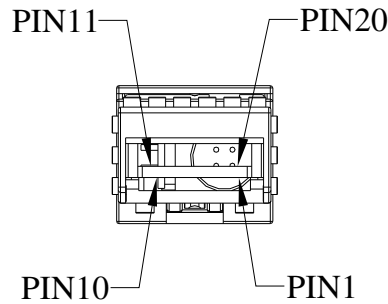
Assembly drawing





## Pin Assignment

Pin-Out



Pin	Signal Name	Description
1	$T_{GND}$	Transmit Ground
2	$TX\_FAULT$	Transmit Fault
3	$TX\_DISABLE$	Transmit Disable
4	$SDA$	SDA Serial Data Signal
5	$SCL$	SCL Serial Clock Signal
6	$MOD\_ABS$	Internal connected to ground
7	$RS0$	Rate select 0, not used
8	$RX\_LOS$	Receiver Loss of Signal, LVTTTL High, open collector
9	$RS1$	Rate select 1, not used
10	$R_{GND}$	Receiver Ground
11	$R_{GND}$	Receiver Ground
12	$RX-$	Receive Data Bar, ac coupled
13	$RX+$	Receive Data, 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, ac coupled
19	$TX-$	Transmit Data Bar, ac coupled
20	$T_{GND}$	Transmitter Ground

Note : All information contained in this document is subject to change without notice.