RoHS compliant
TX-1330/RX-1270 nm Single-mode Bi-directional , 60km
SFP LC Simplex Connector
10.3125Gbps

Features

- 10.3125Gbps application
- Compliant with SFF 8432 SFP+ Module
- Simplex LC connector
- Single power supply 3.3V
- LVTTL Loss of signal indicator
- SFF8472 digital diagnostic monitoring interface (DDM)
- 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-H3U-TC-N33	1330/1270	0°C to 70 °C	1330 DFB	60km(Note)

Note: Attenuation of 0.35 dB/km @1330nm is used for the link length calculations

Diagnostics

Parameter	Range	Accuracy	Calibration
Internal Transceiver Temperature	-10 to 95 ℃	± 3 ℃	Internal
Internal Transceiver Voltage	3.1 to 3.5 V	± 0.1 V	
Bias Current	0 to 100 mA	± 10 %	
TX Power	+2.5 to +7 dBm	± 3 dB	
RX average Power	-21.5 to -7 dBm	± 3 dB	

Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_S	–40	85	°C	
Supply Voltage	*Vcc*	–0.5	4.0	V	
Input Voltage	V_{IN}	–0.5	*Vcc*	V	

Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Case Operating Temperature	T_C	0	70	°C	
Supply Voltage	*Vcc*	3.14	3.46	V	
Supply Current	$I_{TX} + I_{RX}$	---	350	mA	
Dispersion penalty			1	dB	@60KM

Transmitter Electro-optical Characteristics

Vcc = 3.14 V to 3.46 V, T_C = 0 °C to 70 °C

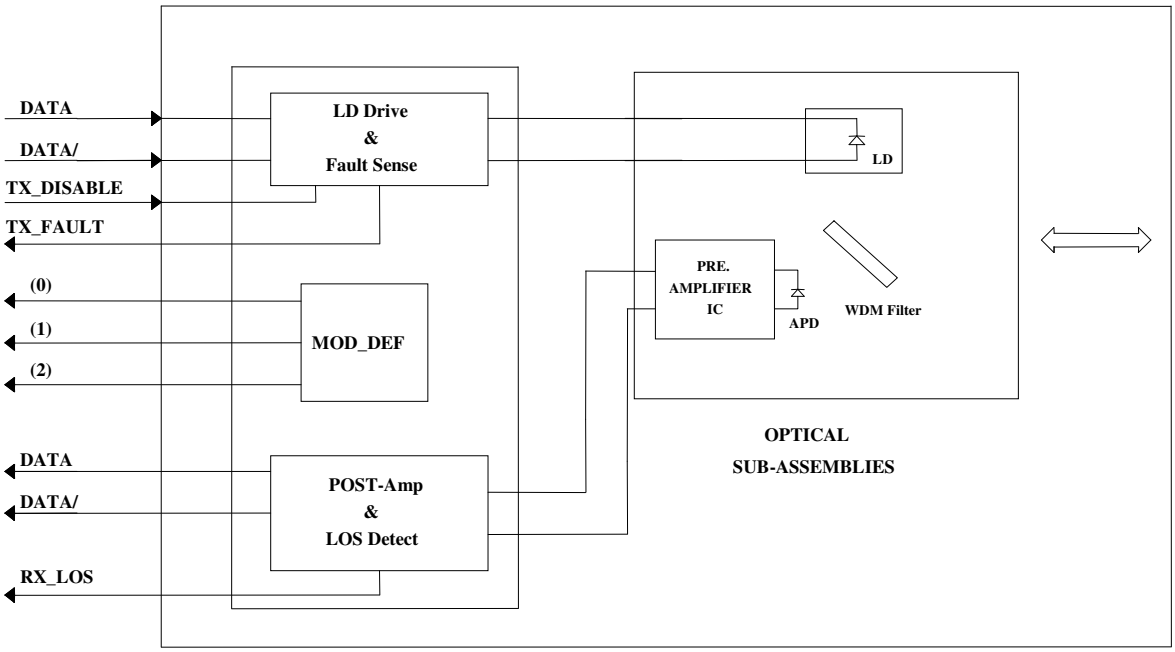
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Bit Rate	B	---	10.3125	---	Gbps	
Output Optical Power	P_{out}	+2.5	---	+7	dBm	Average
Extinction Ratio	ER	6	---	---	dB	
Center Wavelength	λ_C	1320	1330	1340	nm	
Spectral Width (-20dB)	$\Delta\lambda$	---	---	0.5	nm	
Side Mode Suppression Ratio	$SMSR$	30			dB	
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	μs	
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	---	---	1	ms	
TX_DISABLE time to start reset	t_reset	10	---	---	μs	

Receiver Electro-optical Characteristics

Vcc = 3.14 V to 3.46 V, T_C = 0 °C to 70 °C,

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Bit Rate	B	---	10.3125	---	Gbps	
Optical Input Power-maximum	P_{IN}	-7	---	---	dBm	BER < 10^{-12}
Optical Input Power-minimum (Sensitivity)	P_{IN}	---	---	-21.5	dBm	BER < 10^{-12}
Operating Center Wavelength	λ_C	1260	---	1280	nm	
Optical Return Loss	ORL	14	---	---	dB	
Loss of signal -Deasserted	P_D	---	---	-21.5	dBm	
Loss of signal -Asserted	P_A	-35	---	---	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	μs	
Receiver Loss of Signal Assert Time (on to off)	t_{D,RX_LOS}	---	---	100	μs	

Block Diagram of Transceiver



Transmitter and Receiver Optical Sub-assembly Section

A 1330 nm InGaAsP laser and an InGaAs Avalanche 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.

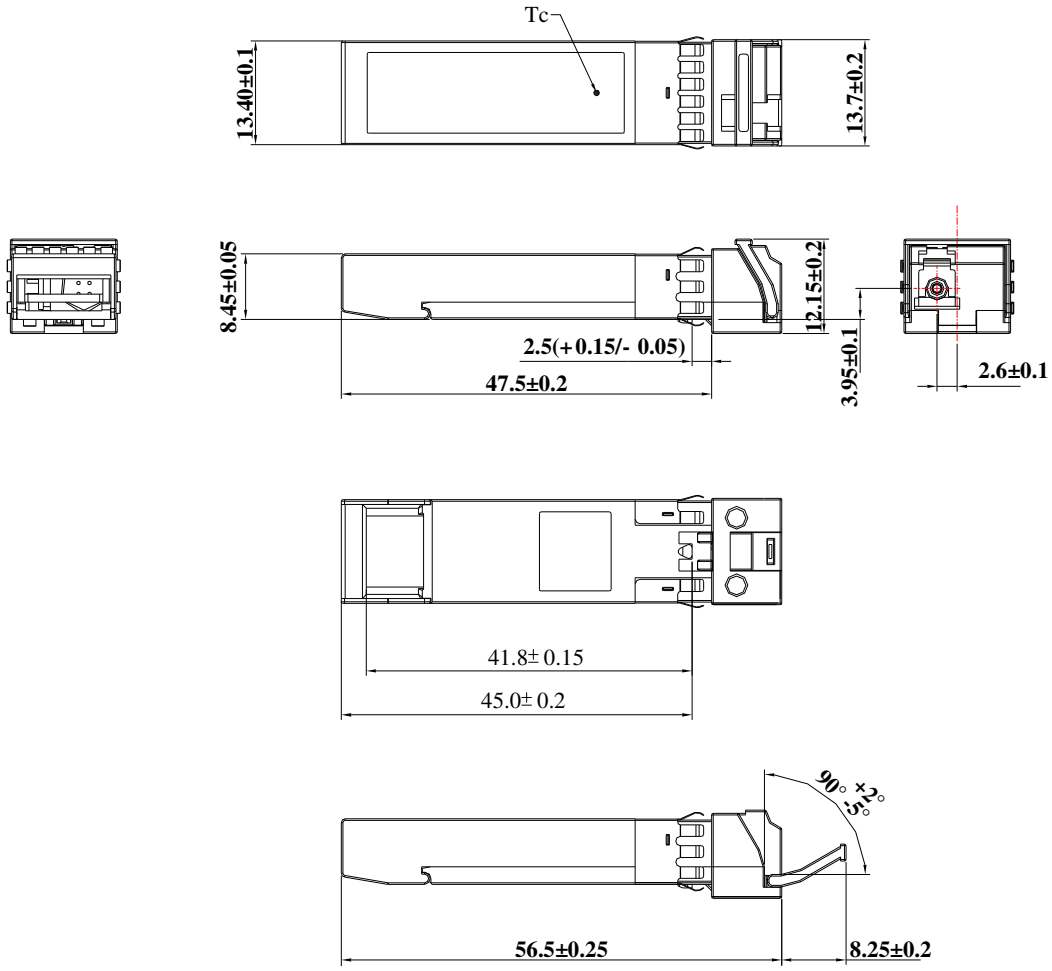
TX_DISABLE

The TX_DISABLE signal is high (LVTTL 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 LVTTL level.

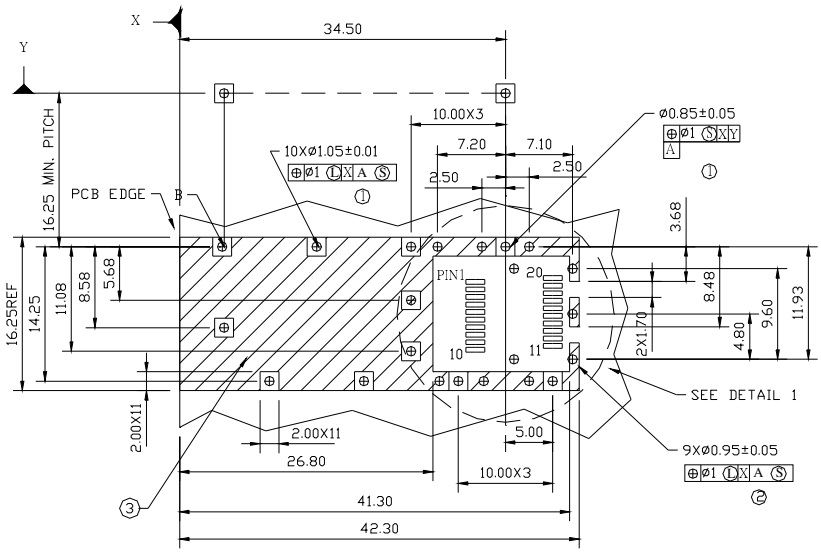
Dimensions

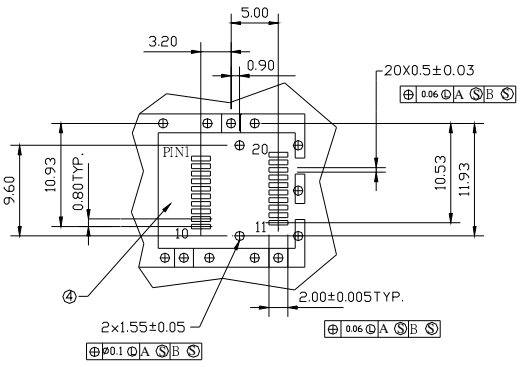


Unit:mm

Latch color: Green

SFP host board mechanical layout





DETAIL 1

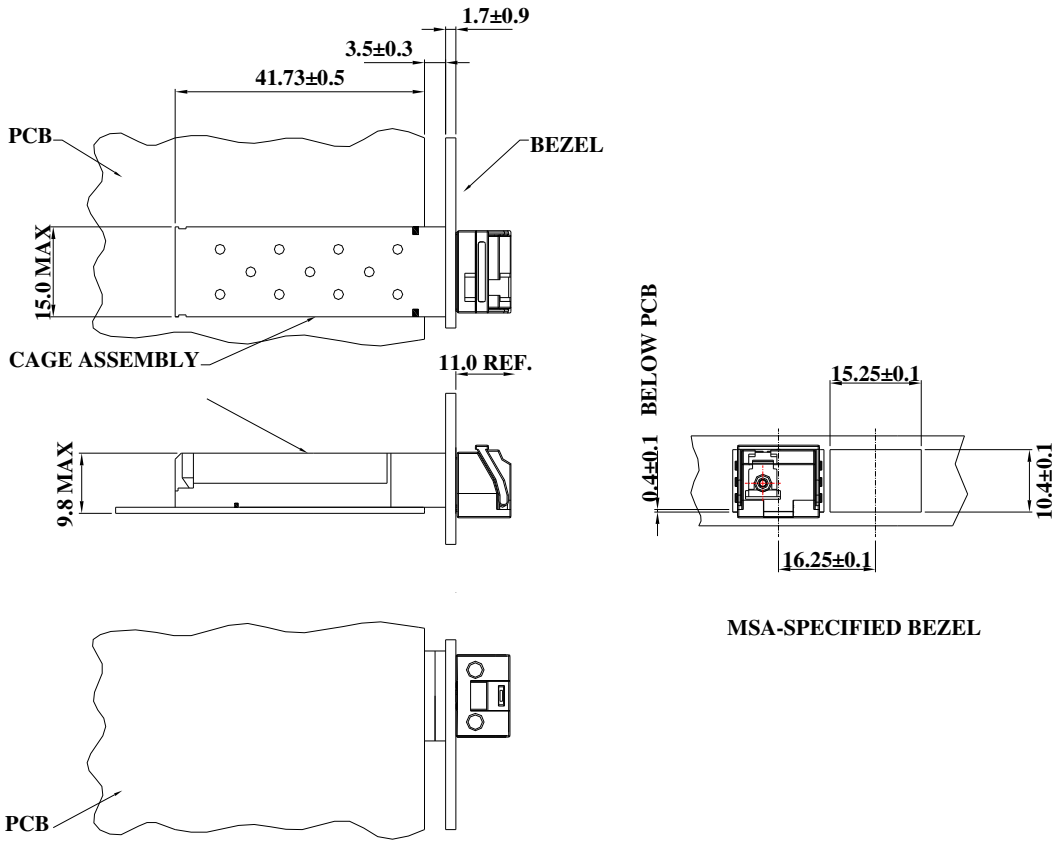
LEGEND

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

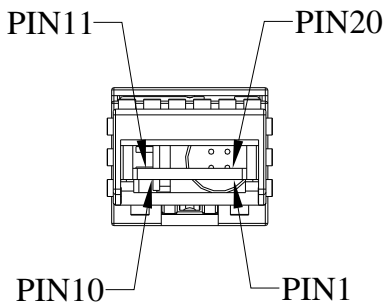
Assembly drawing



Unit: mm

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, LVTTL High, open drain
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.