RoHS compliant
850 nm Multi-mode Transceiver, 1000Base-SX
Small Form Pluggable (SFP), with Diagnostic Monitoring
1.0625Gbd Fiber Channel/1.25 Gigabit Ethernet

Features

- EEE802.3z Gigabit Ethernet application
- SFF8472 diagnostic monitoring interface
- Duplex LC connector
- Differential inputs and outputs
- Single power supply 3.3V
- LVTTL LOS indicator
- Hot Pluggable
- Class 1 laser product complies with EN 60825-1

Ordering Information

PART NUMBER	INPUT/OUTPUT	SIGNAL DETECT	VOLTAGE	TEMPERATURE
LM28-C3S-TC-N-TT	AC/AC	TTL	3.3V	0°C to 70 °C
LM28-C3S-TI-N-TT	AC/AC	TTL	3.3V	-10°C to 85 °C
LM28-C3S-TI-N-ET	AC/AC	TTL	3.3V	-40°C to 85 °C

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 95	± 3	°C	Internal
Voltage	3.1 to 3.5	± 0.1	V	
Bias Current	0 to 15	± 5	mA	
TX Power	-9.5 to -4	± 3 dB	dBm	
RX Power	-18 to 0	± 3 dB	dBm	

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	
		-10	85		
		-40	85		
Supply Voltage	*Vcc*	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	200	mA	

Transmitter Electro-optical Characteristics

***Vcc* = 3.1 V to 3.5 V, T_C = 0 °C to 70 °C (-10 °C to 85 °C) (-40 °C to 85 °C)**

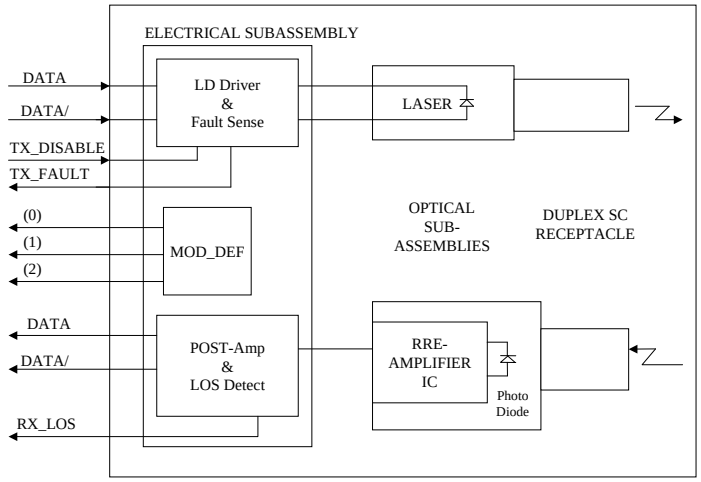
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Output Optical Power 62.5/125, 50/125 μm fiber	P_{out}	-9.5	---	-4	dBm	Average
Extinction Ratio	*ER*	9	---	---	dB	
Center Wavelength	λ_C	830	850	860	nm	
Spectral Width (RMS)	$\Delta\lambda$	---	---	0.85	nm	
Rise/Fall Time, (20–80%)	$T_{r,\,f}$	---	---	260	ps	
Relative Intensity Noise	*RIN*	---	---	–116	dB/Hz	
Total Jitter	*TJ*	---	---	227	ps	
Output Eye			Compliant with IEEE802.3z			
Max. P_{out} TX-DISABLE Asserted	P_{OFF}	---	---	–45	dBm	
Differential Input Voltage	V_{DIFF}	0.4	---	2.0	V	

Receiver Electro-optical Characteristics

Vcc = 3.1 V to 3.5 V, T_C = 0 °C to 70 °C (-10 °C to 85 °C) (-40 °C to 85 °C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Optical Input Power-maximum	P_{IN}	0	---	---	dBm	BER < 10^{-12}
Optical Input Power-minimum (Sensitivity)	P_{IN}	---	---	–18	dBm	BER < 10^{-12}
Operating Center Wavelength	λ_C	770	---	860	nm	
LOS-Deasserted	P_A	---	---	–18	dBm	
LOS-Asserted	P_D	–35	---	---	dBm	
Differential Output Voltage	V_{DIFF}	0.5	---	1.2	V	
Data Output Rise, Fall Time (20–80%)	$T_{r,f}$	---	---	0.35	ns	
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	

Block Diagram of Transceiver



TOP VIEW (Label side)

Transmitter Section

The transmitter section consists of a 850 nm laser 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 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”).

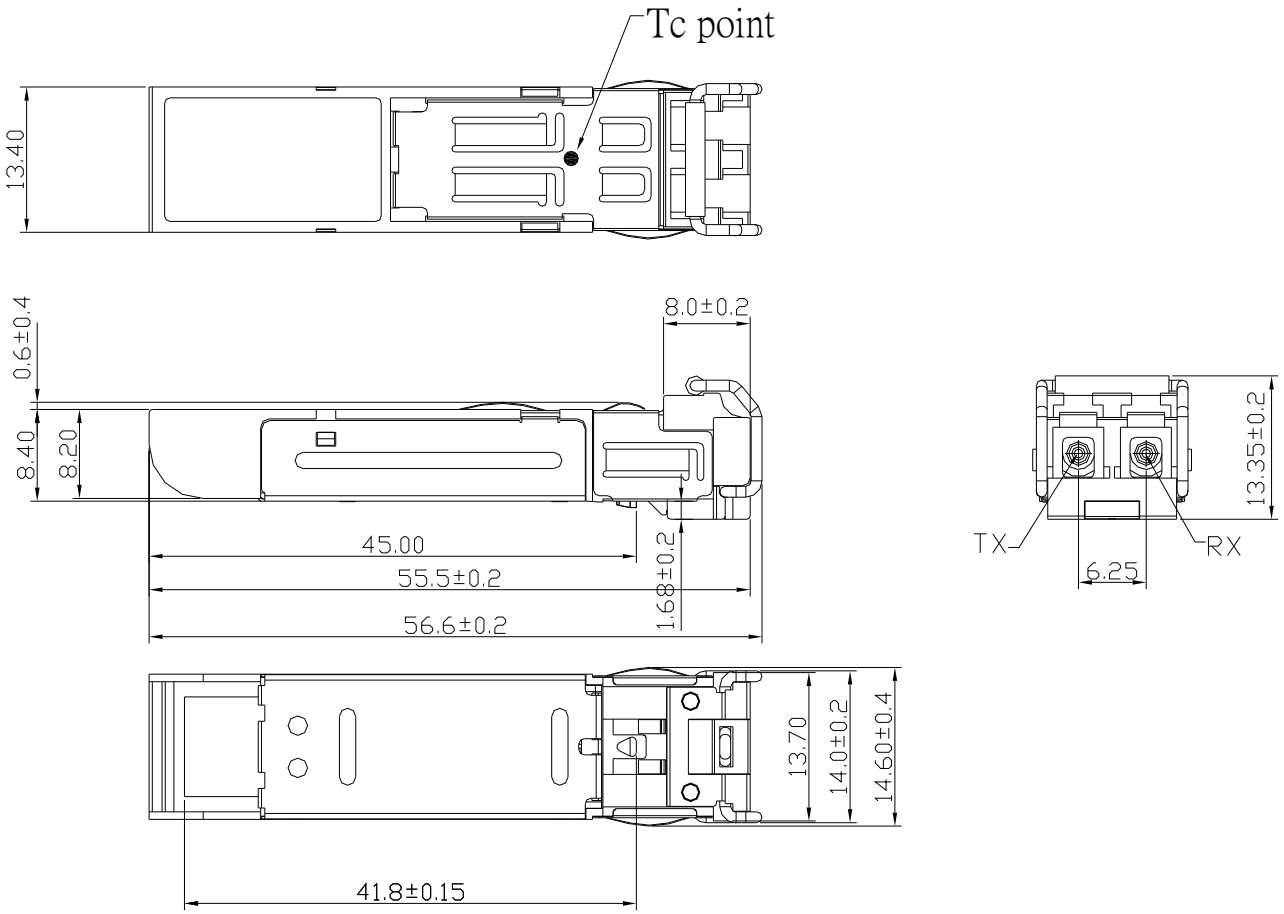
Receiver Section

The receiver utilizes 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 LVTTL level.

Dimensions

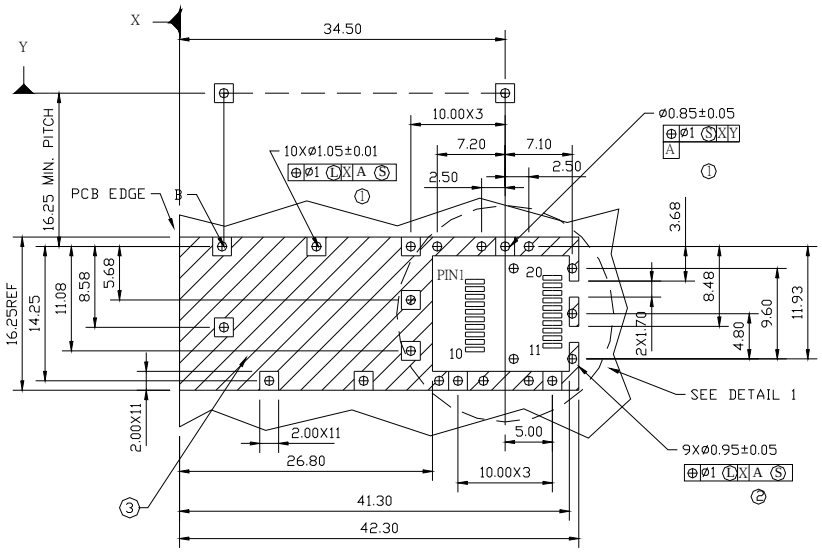


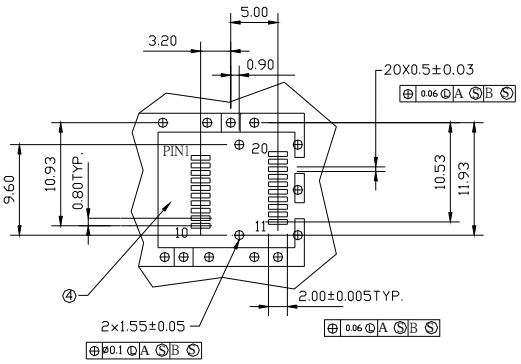
DIMENSIONS ARE IN MILLIMETERS

ALL DIMENSIONS ARE ± 0.1mm UNLESS OTHERWISE SPECIFIED

Unit: mm

SFP host board mechanical layout





DETAIL 1

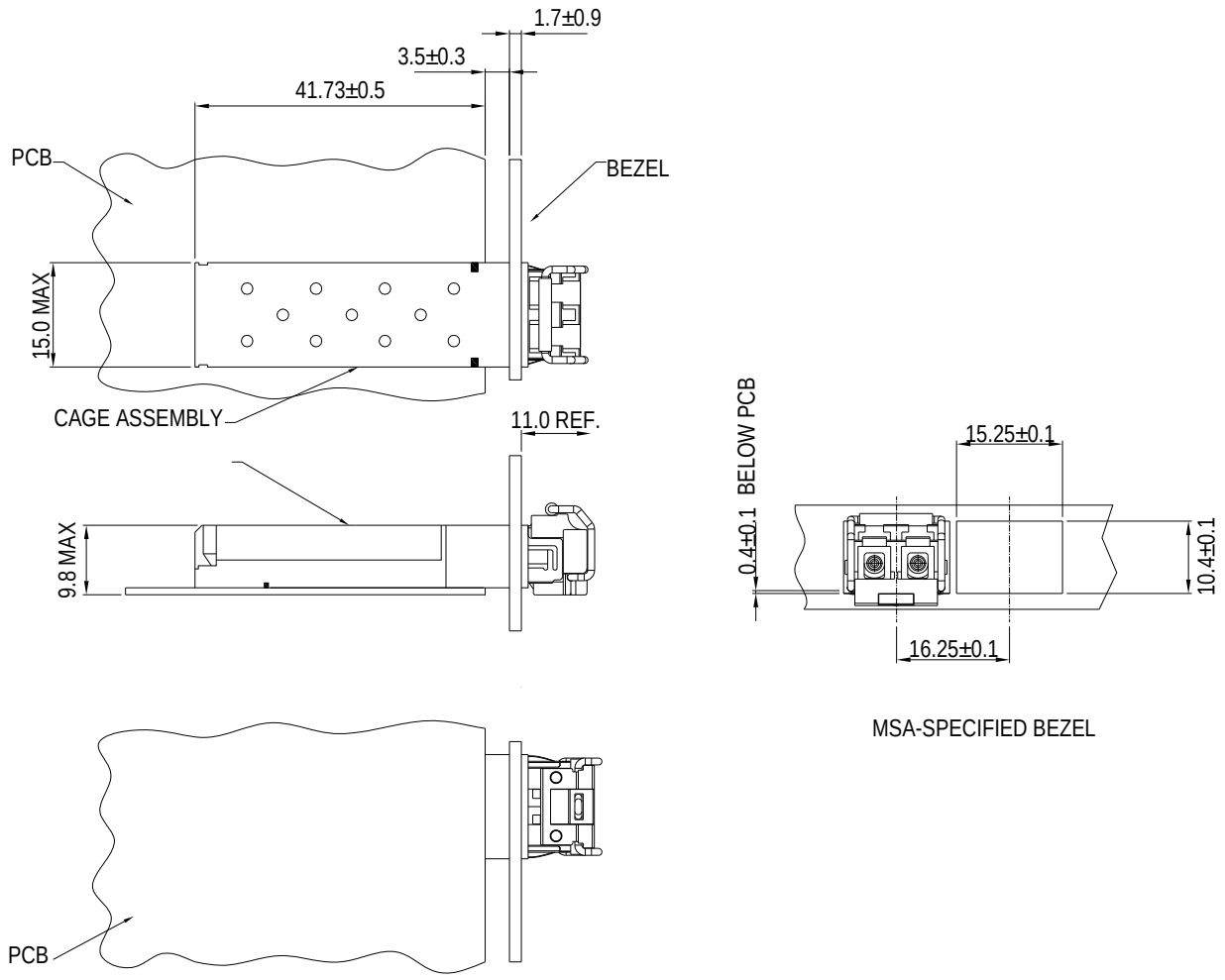
LEGEND

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

Unit: mm

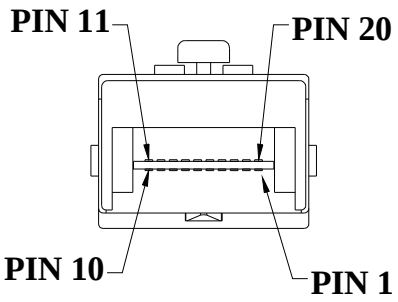
Assembly drawing



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	*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 , ac coupled
13	*RX+*	Receive Data, Differential , 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 , ac coupled
19	*TX–*	Transmit Data Bar, Differential , ac coupled
20	T_{GND}	Transmitter Ground

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