



**RoHS compliant**  
**1310 nm Single-mode Transceiver, 20km**  
**Small Form Pluggable (SFP), with Diagnostic Monitoring**  
**2Mbps C37.94**



**Features**

- IEEE C37.94 application
- RoHS compliant
- Compliant with SFF8472 diagnostic monitoring interface
- Duplex LC connector
- Single power supply 3.3V
- Hot Pluggable
- Class 1 laser product complies with EN 60825-1

**Ordering Information**

PART NUMBER	INPUT/OUTPUT	SIGNAL DETECT	VOLTAGE	TEMPERATURE	DISTANCE
LS38-A3C-TC-N-EC	AC/AC	TTL	3.3V	0°C to 70 °C	20Km
LS38-A3C-TI-N-EC	AC/AC	TTL	3.3V	-40°C to 85 °C	20Km

**Diagnostics**

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	± 3	°C	Internal
Voltage	3.1 to 3.5	± 0.1	V	
Bias Current	0 to 60	± 10%	mA	
TX Power	-19 to -11	± 3 dB	dBm	
RX Power	-32 to -8	± 3 dB	dBm	



RoHS compliant  
1310 nm Single-mode Transceiver, 20km  
Small Form Pluggable (SFP), with Diagnostic Monitoring  
2Mbps C37.94

---

### 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
Operating Case Temperature	$T_C$	0 -40	70 85	°C	
Supply Voltage	$V_{CC}$	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	250	mA	



**RoHS compliant**  
**1310 nm Single-mode Transceiver, 20km**  
**Small Form Pluggable (SFP), with Diagnostic Monitoring**  
**2Mbps C37.94**

---

**Transmitter Electro-optical Characteristics**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Output Optical Power	$P_{out}$	-19	---	-11	dBm	Average
Extinction Ratio	$ER$	12	---	---	dB	
Center Wavelength	$\lambda_C$	1290	1310	1350	nm	
Max. $P_{out}$ TX-DISABLE Asserted	$P_{OFF}$	---	---	-45	dBm	
Differential Input Voltage	$V_{DIFF}$	0.4	---	2.0	V	



RoHS compliant  
1310 nm Single-mode Transceiver, 20km  
Small Form Pluggable (SFP), with Diagnostic Monitoring  
2Mbps C37.94

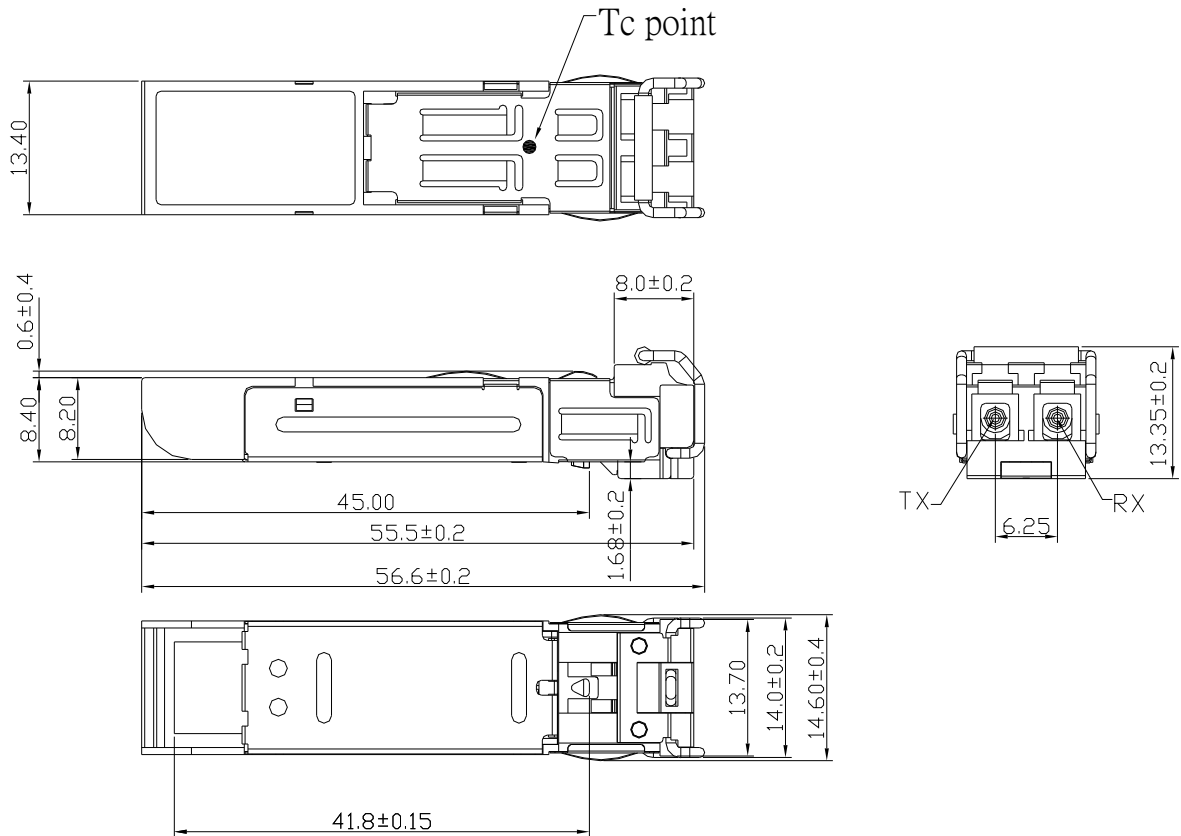
### Receiver Electro-optical Characteristics

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Optical Input Power-maximum	$P_{IN}$	-8	---	---	dBm	PRBS7, BER < $10^{-9}$
Optical Input Power-minimum (Sensitivity)	$P_{IN}$	---	---	-32	dBm	PRBS7, BER < $10^{-9}$
Operating Center Wavelength	$\lambda_C$	1260	---	1360	nm	
LOS-Deasserted	$P_A$	---	---	-32	dBm	
LOS-Asserted	$P_D$	-45	---	---	dBm	
Differential Output Voltage	$V_{DIFF}$	0.6	---	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	



**RoHS compliant**  
**1310 nm Single-mode Transceiver, 20km**  
**Small Form Pluggable (SFP), with Diagnostic Monitoring**  
**2Mbps C37.94**

**Dimensions**

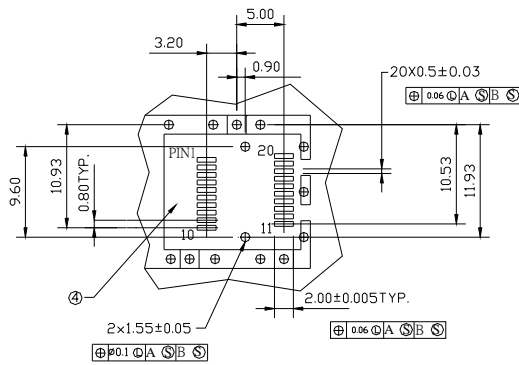
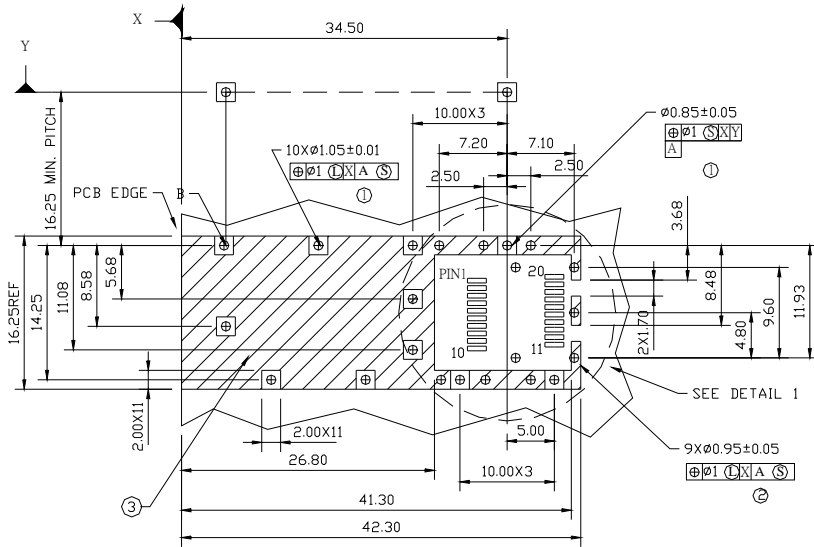


**DIMENSIONS ARE IN MILLIMETERS**

**ALL DIMENSIONS ARE ± 0.1mm UNLESS OTHERWISE SPECIFIED**

Unit: mm

**SFP host board mechanical layout**



DETAIL 1

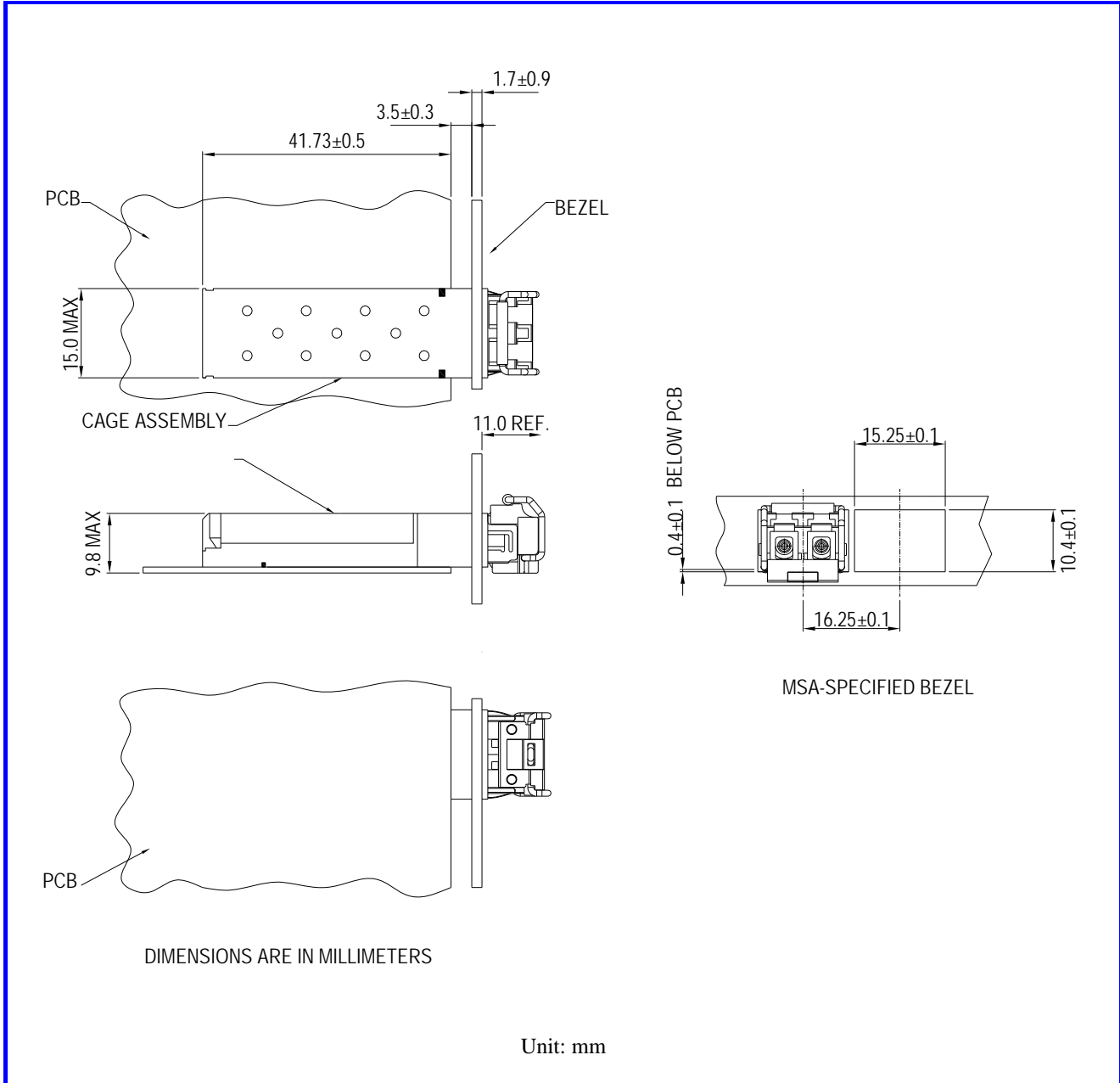
**LEGEND**

- 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

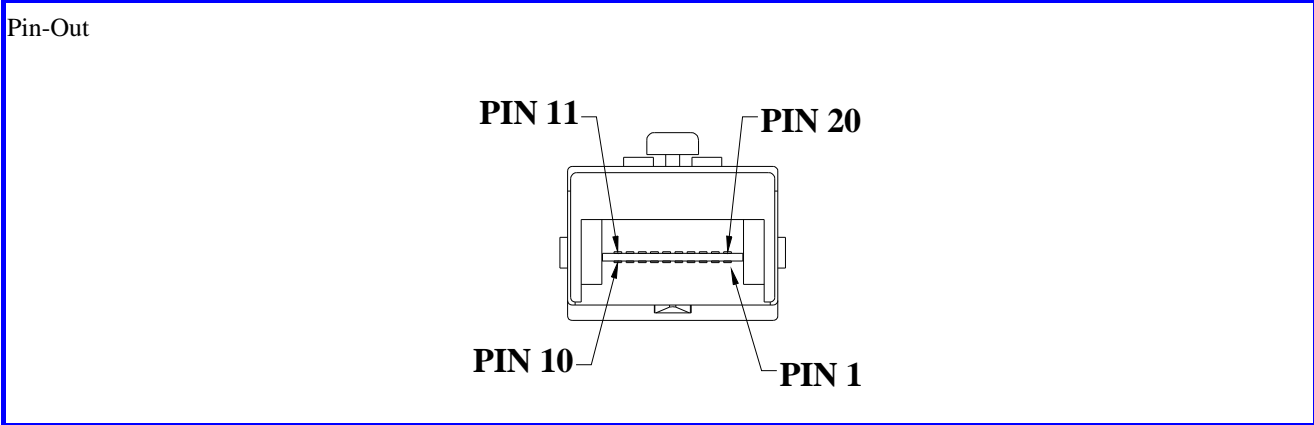
**Assembly drawing**





**RoHS compliant**  
**1310 nm Single-mode Transceiver, 20km**  
**Small Form Pluggable (SFP), with Diagnostic Monitoring**  
**2Mbps C37.94**

**Pin Assignment**



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