

### Product Overview

The MOD-MGLX20-D of Small Form Factor Pluggable (SFP) transceiver module is specifically designed for high performance integrated duplex data link over single mode optical fiber. The high-speed laser diode and photo diode are provided as a light source and a detector, respectively. An EEPROM contained the detailed product information and digital diagnostics function for the host equipment is accessed by the 2-wire serial CMOS EEPROM protocol. It complies with SFP MSA, SONET/SDH standards, Class 1 laser products, EN60825, and EN60950.



### Features

- RoHS Compliant
- Digital Diagnostics are External Calibrated
- Operation Temperature: 0~70°C
- 1310nm uncooled FP LD
- 20Km link distance<sub>(indicative only)</sub>
- Hot pluggable
- Metal enclosure, low EMI
- Single 3.3V power supply
- Low Power Dissipation

### Applications

- Metro Access Rings
- Point-to-Point networking
- 1x Fiber Channel
- Gigabit Ethernet
- Suitable for Fast Ethernet and OC-12

### Ordering information

Product Code	Description/Clasp Color
MOD-MGLX20-D	1310nm, Blue

**Gigabit Ethernet / 1x Fiber Channel**  
**1310 nm LX SFP Transceiver**  
**RoHS, SFF-8472 Compliant**  
**Specification: MOD-MGLX20-D**

**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T <sub>S</sub>	<b>-40</b>		<b>+85</b>	°C	
Supply Voltage	V <sub>CC</sub> T V <sub>CC</sub> R	<b>0</b>		<b>5.5</b>	V	
Relative Humidity	RH	<b>0</b>		<b>85</b>	%	

**Recommended Operating Conditions**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Temperature	T <sub>OP</sub>	<b>0</b>		<b>70</b>	°C	
Supply Voltage	V <sub>CC</sub> T,R	<b>3.1</b>	<b>3.3</b>	<b>3.5</b>	V	
Supply Current	I <sub>TX</sub> +I <sub>RX</sub>		<b>200</b>	<b>300</b>	mA	

**Gigabit Ethernet / 1x Fiber Channel**  
**1310 nm LX SFP Transceiver**  
**RoHS, SFF-8472 Compliant**  
**Specification: MOD-MGLX20-D**

**Transmitter Electro-Optical Interface** ( $T_C = 0 \sim 70^\circ\text{C}$ ,  $V_{CC} T, R = 3.1\text{V} < V_{CC} < 3.5\text{V}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter Differential Input Voltage	TD +/-	<b>400</b>		<b>2000</b>	mVp-p	A
Optical Output Power	P <sub>O</sub>	<b>-9</b>		<b>-3</b>	dBm	A
Optical Extinction Ratio	E <sub>R</sub>	<b>9</b>			dB	A
Center Wavelength	$\lambda_C$	<b>1280</b>	<b>1310</b>	<b>1355</b>	nm	A
Spectral Width	$\Delta\lambda$			<b>&lt;4</b>	nm	A
Optical Rise / Fall Time	t <sub>r</sub> / t <sub>f</sub>			<b>0.25</b>	nsec	A,B
Tx_Fault - High	V <sub>Fault_H</sub>	<b>2</b>		V <sub>CC</sub>	V	A
Tx_Fault - Low	V <sub>Fault_L</sub>	V <sub>ee</sub>		V <sub>ee</sub> + <b>0.5</b>	V	A
Tx_Disable - High	V <sub>Disable_H</sub>	<b>2</b>		V <sub>CC</sub>	V	A
Tx_Disable - Low	V <sub>Disable_L</sub>	V <sub>ee</sub>		V <sub>ee</sub> + <b>0.8</b>	V	A

**Notes:**

**A.** All of data is measured at 1250Mbps , PRBS 2<sup>7</sup>-1 ,NRZ.

**B:** 20%~80%

**Receiver Electro-Optical Interface** ( $T_C = 0 \sim 70^\circ\text{C}$ ,  $V_{CC} T, R = 3.1\text{V} < V_{CC} < 3.5\text{V}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Differential Output Voltage	RD +/-	<b>600</b>	<b>800</b>		mV <sub>P-P</sub>	
Receiver Overload	P <sub>IN</sub> MAX	<b>-3</b>			dBm	A,B
Receiver Sensitivity	P <sub>IN</sub> MIN			<b>-24</b>	dBm	A,B
Operating Center Wavelength	$\lambda_c$	<b>1270</b>		<b>1620</b>	nm	
Receiver LOS Assert Level	P <sub>RX_LOS A</sub>	<b>-35</b>			dBm	B
Receiver LOS Deassert Level	P <sub>RX_LOS D</sub>			<b>-24.5</b>	dBm	B
Receiver Loss of Signal Hysteresis		<b>0.5</b>	<b>2</b>		dB	B

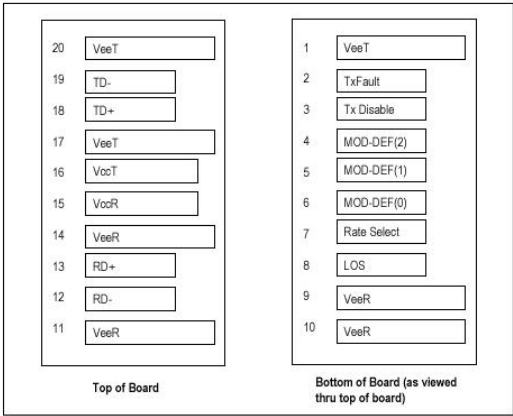
**Notes:**

**A.** With BER better than or equal to  $1 \times 10^{-12}$

**B.** measured in the center of the eye opening with 2<sup>7</sup> -1 PRBS, NRZ

Gigabit Ethernet / 1x Fiber Channel  
1310 nm LX SFP Transceiver  
RoHS, SFF-8472 Compliant  
Specification: MOD-MGLX20-D

Pin Description



SFP Transceiver Electric Pad Layout

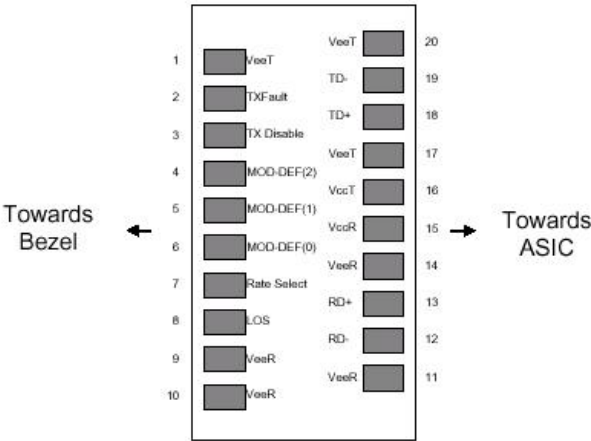


Diagram of Host Board Connector Block Pin Numbers and Names

**Gigabit Ethernet / 1x Fiber Channel**  
**1310 nm LX SFP Transceiver**  
**RoHS, SFF-8472 Compliant**  
**Specification: MOD-MGLX20-D**

Pin No.	Pin Name	Function	Plug Seq.	Notes
1	V <sub>cc</sub> T	Transmitter Ground	1	1
2	TX Fault	Transmitter Fault Indication	3	2
3	TX Disable	Transmitter Disable	3	3
4	MOD_DEF 2	Module Definition 2	3	4
5	MOD_DEF 1	Module Definition 1	3	4
6	MOD_DEF 0	Module Definition 0	3	4
7	Rate Select	Select between full or reduced receiver bandwidth	3	5
8	LOS	Loss of Signal	3	6
9	V <sub>cc</sub> R	Receiver Ground	1	1
10	V <sub>cc</sub> R	Receiver Ground	1	1
11	V <sub>cc</sub> R	Receiver Ground	1	1
12	RD -	Inv. Receiver Data Out	3	
13	RD +	Receiver Data Out	3	
14	V <sub>cc</sub> R	Receiver Ground	1	1
15	V <sub>cc</sub> R	Receiver Power	2	
16	V <sub>cc</sub> T	Transmitter Power	2	
17	V <sub>cc</sub> T	Transmitter Ground	1	1
18	TD +	Transmitter Data In	3	
19	TD -	Inv. Transmitter Data In	3	
20	V <sub>cc</sub> T	Transmitter Ground	1	1

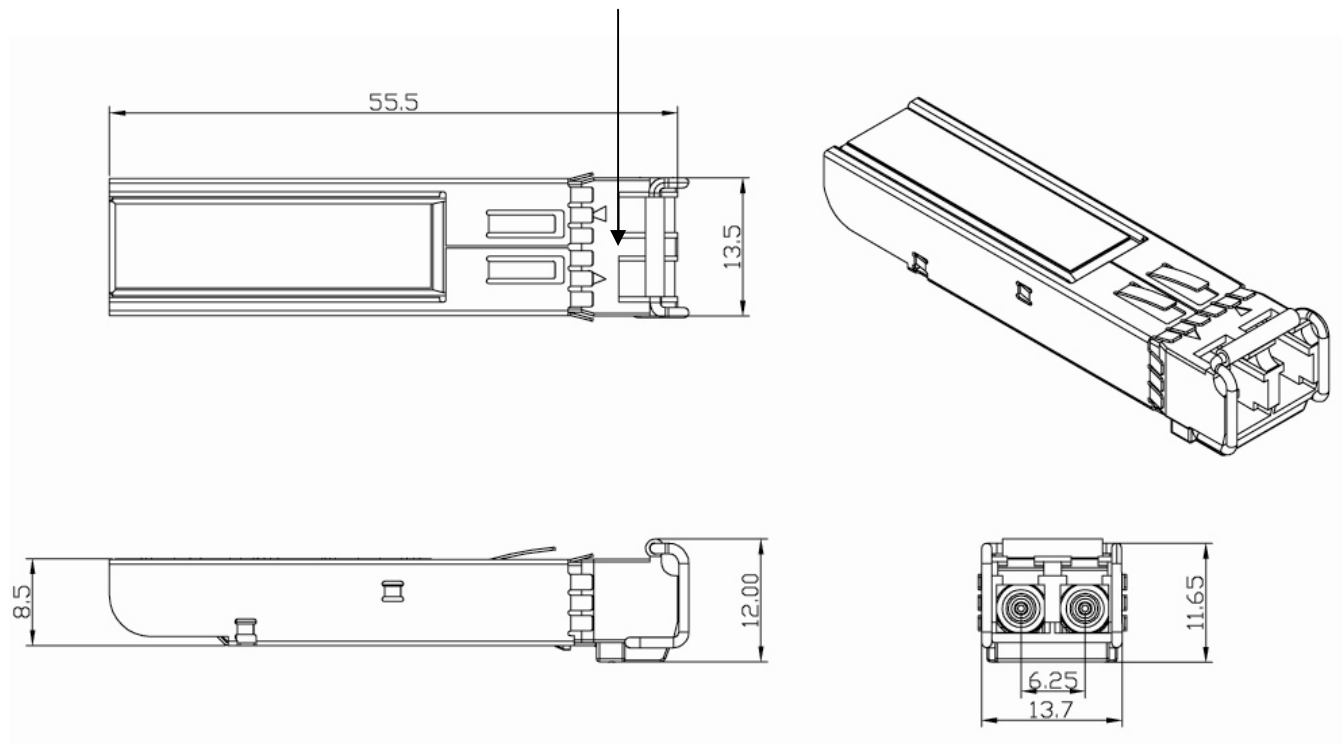
Note:

- 1, Circuit ground is internally isolated from chassis ground
- 2, Open-Collector outputs, asserted when LD and/or APC function fail.
- 3, Disable when high voltage (>2.0V or Open)
- 4, Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 5.5V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
- 5, No connection required
- 6, LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 5.5V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

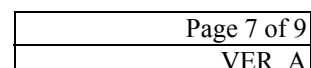
**Gigabit Ethernet / 1x Fiber Channel**  
**1310 nm LX SFP Transceiver**  
**RoHS, SFF-8472 Compliant**  
**Specification: MOD-MGLX20-D**

**Mechanical Dimensions** (Units in mm)

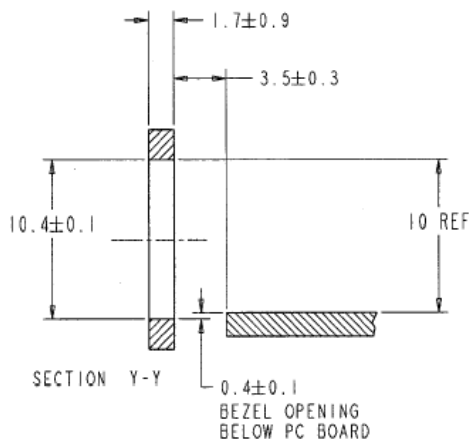
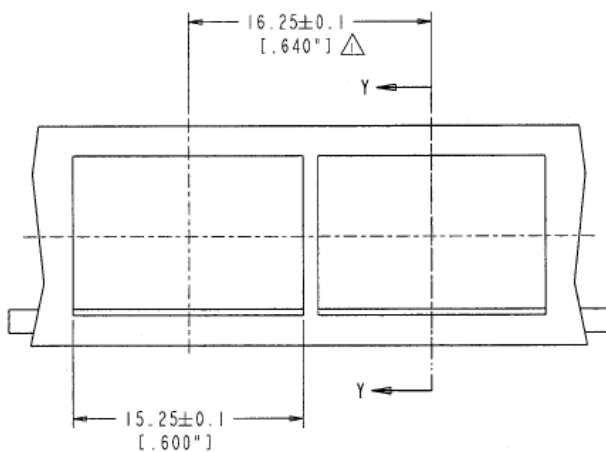
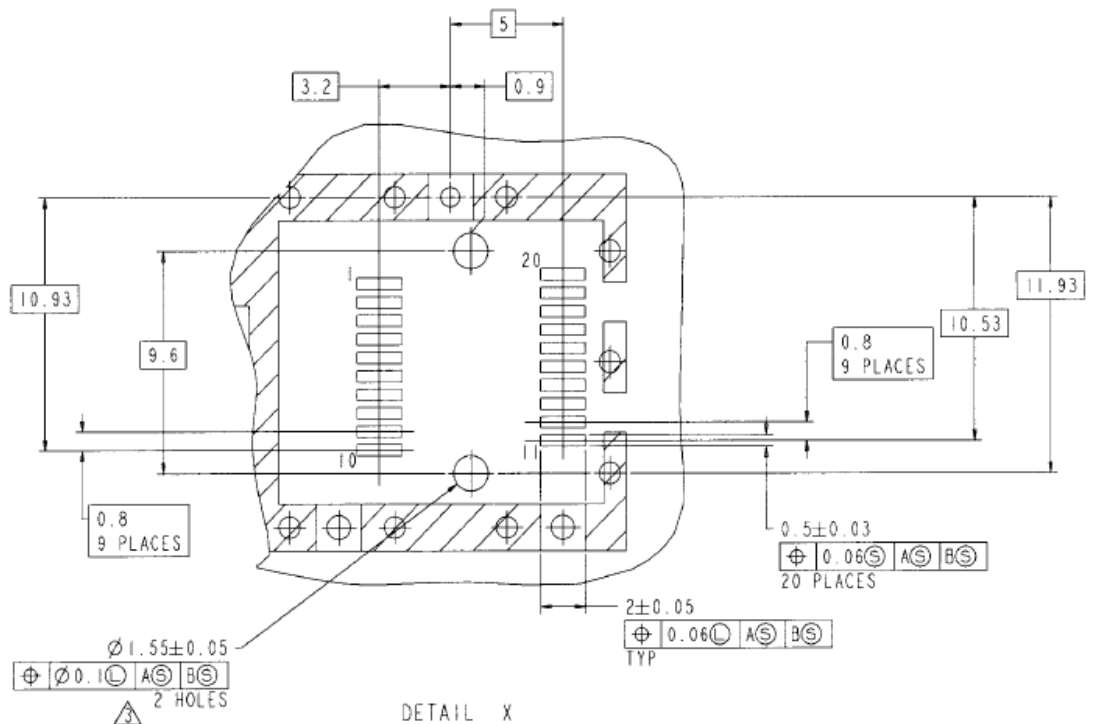
Tc measurement point



## 1. SFP Host PCB layout



**Gigabit Ethernet / 1x Fiber Channel**  
**1310 nm LX SFP Transceiver**  
**RoHS, SFF-8472 Compliant**  
**Specification: MOD-MGLX20-D**

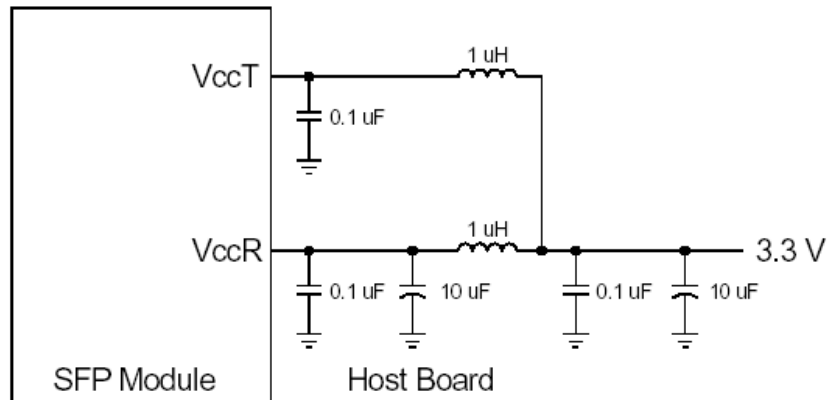


NOTES:

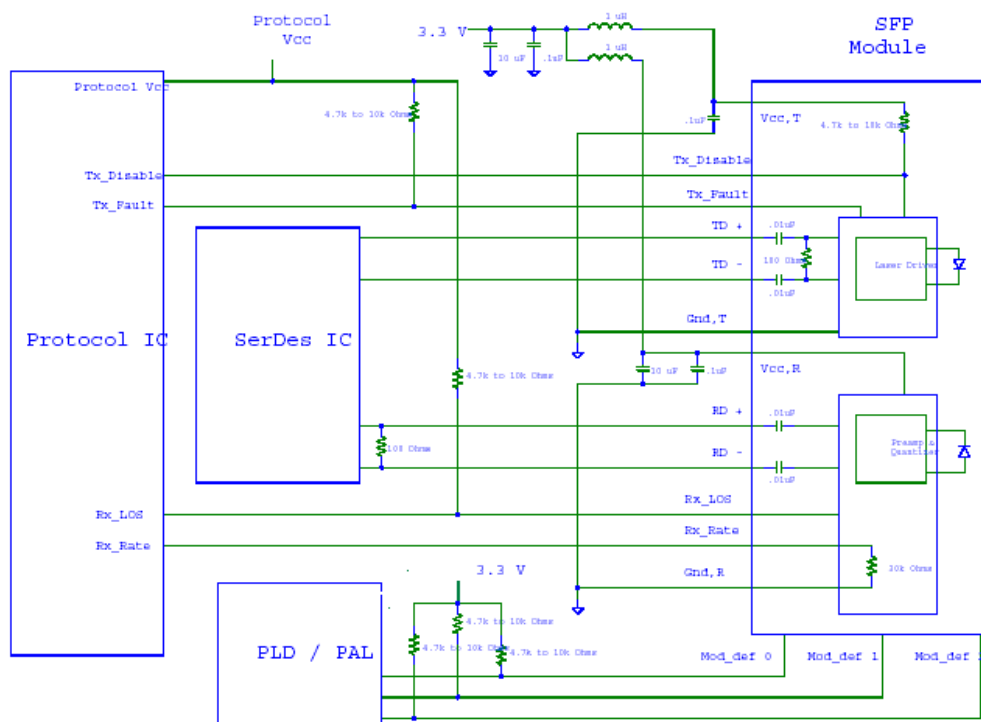
1. MINIMUM PITCH ILLUSTRATED, ENGLISH DIMENSIONS ARE FOR REFERENCE ONLY
2. NOT RECOMMENDED FOR PCI EXPANSION CARD APPLICATIONS



## 2.Application Circuit



**Figure 2A. Recommended Host Board Supply Filtering Network**



**Figure 2B. Example SFP Host Board Schematic**