HD 3.0Gbps/155Mbps Bi-Di Asymmetry Transceiver Module

TSTR-H8821XL / H8281XL

Product Description

TSTR-H8821XL/H8281XL HD series of transceiver Modules are the perfect solution for High-speed communication networks.

The transceiver modules may use different data rates (or data level) between transmitter and receiver, support data rates up to 3.0 Gbps. These modules are fully compliant with the Multi-sourced SFP protocol.

The TSTR-H8821XL/H8281XL series is high performance module for single fiber communications by using 1310nm/1550nm transmitter and 1550nm/1310nm receiver. The transmitter section uses a DFB (or FP) laser diode and is a class 1 laser compliant according to International Safety Standard IEC-825. The receiver section uses an integrated 1310 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A LVPECL/CML logic interface simplifies interface to external circuitry.

Order Information

Table 1: Order Information

Type	Fiber Type	Tx Wavelength (nm)	Fiber Length (Km)
TSTR-H82812L	SM	1310 (FP LD)	20
TSTR-H88213LJ	SM	1550 (DFB LD)	20

Product Features

- SMPTE 297-2006 Compatible
- 1-Fiber Bi-Directional SFP Optical Transceiver
- Speed from 155 Mbps to 3.0Gbps with up to 20 km Single-mode Fiber
- Support Video Pathological Patterns for SD-SDI,
- HD-SDI and 3.0G-SDI :1550 nm Transmitter ,1310 nm Receiver
- Simplex LC Connector
- Single +3.3 V Power Supply
- RoHS-6 Compliant
- 0 to 70oC Operation
- Compliant with Small Form-Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA) and SFF-8472 v9.3

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Application

- SMPTE 292M/297M/259M Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

Absolute Maximum Ratings

Operating of the transceiver beyond the Absolute Conditions Listed in Table 1 will degrade or damage the product. It's not implied that the product would function above the recommended operating environment, it's possible to reduce the reliability and lifetime of device if Recommended Operating Environment is exceeded (Refer to table 2)

Table 1-- Absolute Maximum Conditions

Parameter		Symbol	Min	Max	Units
Storage Temperature		T_{ST}	-40	+85	℃
Operating Temperature	Commerce level	T_{OP}	0	+70	℃
Supply Voltage		V_{CC}	0	+3.6	V
Output Current		I_O	0	30	mA
Relative Humidity		RH	5	95	%
Input voltage		V_{IN}	0	V_{CC}	V
Lead Soldering Temperature & Time		-	-	260/10	℃/S

Table 2-- Recommended Operating Environment

Parameter		Symbol	Min	Typ	Max	Units
Supply Voltage	3.3V power	V_{CC}	3.1	3.3	3.5	V
operating Case Temperature	Commerce level	TOP	0	-	+70	℃
Baud Rate			-	3.0	-	Gbps
			-	155	-	Mbps
Supply Current		$I_{TX}+I_{RX}$	-	200	280	mA

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Optical Parameters

Table 3 NTR-H82812L **Asymmetry Transceiver Optical Characteristics**

(Ambient Operating Temperature Ta=+25±5°C, V_{CC} = 3.3±0.2V)

Parameter	Symbol	Min	Typ	Max	Units
Transmitter					
Data rate	B	-	155	-	Mb/s
Output Center Wavelength	λc	1260	1310	1360	nm
Output Spectral width (RMS)	λ	-	-	3.0	nm
Average Optical Output Power	Po	-10	-	-5	dBm
Extinction Ratio	EXT	10	-	-	dB
Optic Output Eye: Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
Receiver					
Data rate	B	-	3.0	-	Gb/s
Receiver Sensitivity	P_{MIN}	-	-	-18	dBm
Maximum Input Power	P_{MAX}	-3	-	-	dBm
Loss of Signal -- Assert	LOS_A	-30	-	-	dBm
Loss of Signal -- Deassert	LOS_D	-	-	-18	dBm
LOS Hysteresis	LOS_{HYS}	0.5	-	-	dB

Table 4 NTR-H88213LJ **Asymmetry Transceiver Optical Characteristics**

(Ambient Operating Temperature Ta=+25±5°C, V_{CC} = 3.3±0.2V)

Parameter	Symbol	Min	Typ	Max	Units
Transmitter					
Data rate	B	-	3.0	-	Gb/s
Output Center Wavelength	λc	1480	1550	1580	nm
Output Spectral width (-20dB)	λ	-	-	1.0	nm
Average Optical Output Power	Po	-5	-3	0	dBm
Extinction Ratio	EXT	6.5	-	-	dB
Optic Output Eye: Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
Receiver					
Data rate	B	-	155	-	Mb/s
Receiver Sensitivity	P_{MIN}	-	-	-25	dBm
Maximum Input Power	P_{MAX}	-3	-	-	dBm
Loss of Signal -- Assert	LOS_A	-35	-	-	dBm
Loss of Signal -- Deassert	LOS_D	-	-	-25	dBm
LOS Hysteresis	LOS_{HYS}	0.5	-	-	dB

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Electrical Parameters

Table5 (Ambient Operating Temperature Ta=+25±5°C, V_{CC} = 3.3±0.2V)

Parameter	Symbol	Min	Typ	Max	Units
Transmitter					
Differential Input	VIN,P-P	200	-	2400	mV
Tx_Fault-High	VFault_H	Vcc-0.4	-	Vcc	V
Tx_Fault-Low	VFault_L	-	-	0.4	V
Tx_Disable-High	VDisable_H	Vcc-1.3	-	Vcc	V
Tx_Disable-Low	VDisable_L	V_{EE}	-	V_{EE} +0.8	V
Receiver					
Differential Output Voltage	VOUT,P-P	600	700	1000	mVpp
LOS Fault	VLOS_H	2.0	-	Vcc	V
LOS Normal	VLOS_L	-	-	0.4	V

EEPROM Information Functions

The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

Additionally, SFP transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real- time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end - users when particular operating parameters are outside of a factory set normal range.

The SFP MSA defines a 256- byte memory map in E^2PROM that is accessible over a 2- wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged. The interface is identical to, and is thus fully backward compatible with both the GBIC Specification and the SFP Multi Source Agreement. The complete interface is described in "Digital Diagnostics Monitoring Interface for SFP Optical Transceivers".

2 wire address 1010000X(A0h)

Serial ID Defined by SFP MSA (96 bytes)
Vendor Specific (32 bytes)
Reserved in SFP MSA(128 bytes)

2 wire address 1010001X(A2h)

larm and Warning Thresholds (56 bytes)
Cal constants (40 bytes)
Real Time Diagnostic Interface(24 bytes)
Vendor specific(8 bytes)
User Writable EEPROM (120 bytes)
Vendor specific(8 bytes)

EPROM Serial ID Memory Contents:

Table 6 Serial ID Memory Contents

Data Address	Size (Byte)	Name of Field	Description
Base ID Fields			
0	1	Identifier	SFP
1	1	Ext. Identifier	SFP function is defined by serial ID only
2	1	Connector	LC Connector
3-10	8	Transceiver	Transceiver Codes
11	1	Encoding	NRZ
12	1	BR, Nominal	3Gbps
13	1	Reserved	
14	1	Length(9μm)km	Transceiver transmit distance
15	1	Length(9μm)100m	
16	1	Length(50μm)10m	
17	1	Length(62.5μm)10m	
18	1	Length(Copper)	Not compliant
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: Neton
36	1	Reserved	
37-39	3	Vendor OUI	
40-55	16	Vendor PN	Part Number: “NTR-xxxxx”
56-59	4	Vendor rev	3.0
60-61	2	Wavelength	Transceiver wavelength
62	1	Reserved	
63	1	CC_BASE	Check code for Base ID Fields
Extended ID Fields			
64-65	2	Options	TX_FAULT, TX_DISABLE and Loss of Signal implemented.
66	1	BR, max	
67	1	BR, min	
68-83	16	Vendor SN	Serial number
84-91	8	Date code	Manufactory date code
92	1	Diagnostic Monitoring Type	Digital diagnostic monitoring implemented, “internally calibrated” is implemented, RX measurement type is “Average Power”.
93	1	Enhanced Options	Optional Alarm/Warning flags implemented for all monitored quantities, Optional Soft RX_LOS monitoring implemented.
94	1	SFF-8472 Compliance	Includes functionality described in Rev 9.3 SFF-8472.
95	1	CC_EXT	Check sum for the extended ID Fields
Vendor Specific ID Fields			
96-127	32	Vendor Specific	Depends on customer information

Pin Assignment & Signal Definition

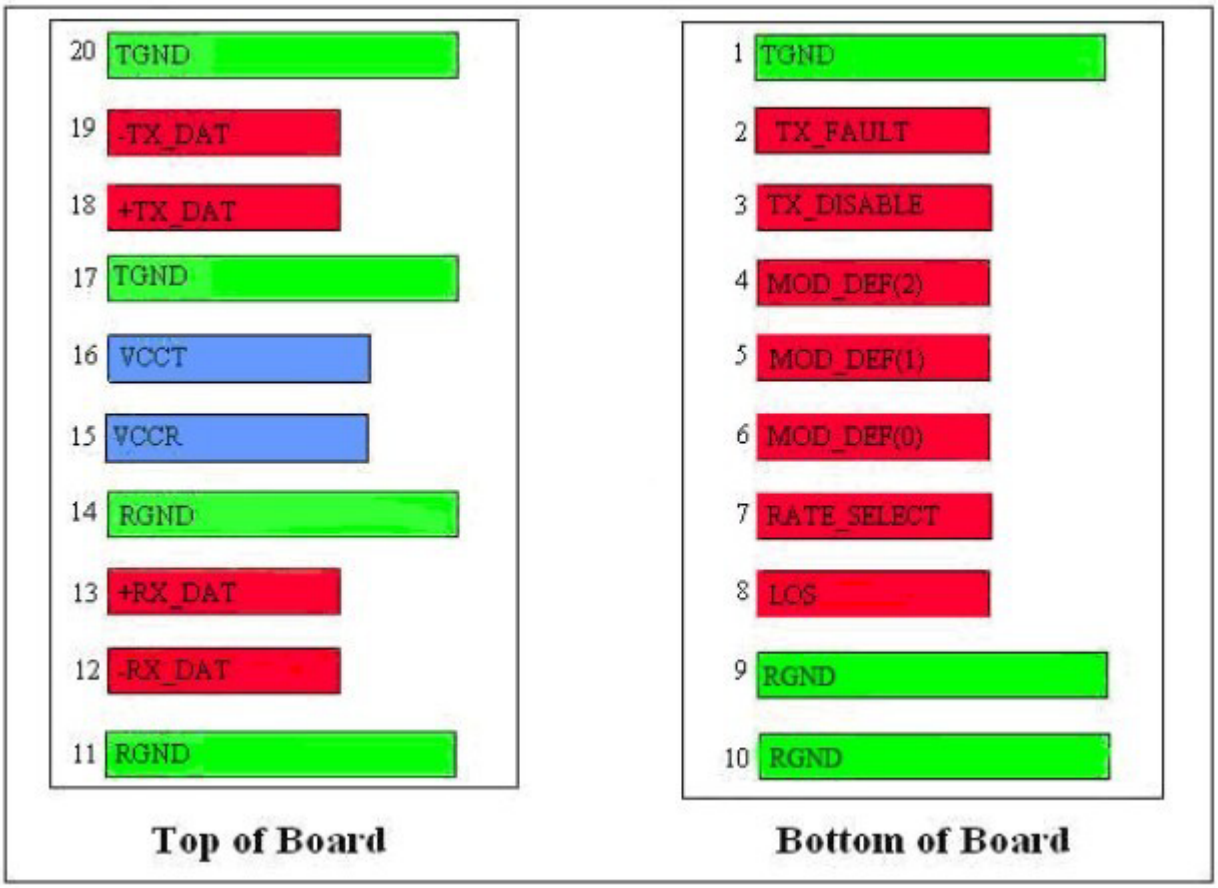

Table 7－SFP to host connector pin assignment

Pin #	Pin Name	Plug Sequence	Input/Output	Description
1	TGND	1		Transmitter Ground
2	TX_FAULT	3	Output	Transmit Fault Indication
3	TX_DISABLE	3	Input	Transmit Disable
4	MOD_DEF(2)	3	Input/Output	SDA Serial Data Signal
5	MOD_DEF(1)	3	Input	SCL Serial Clock Signal
6	MOD_DEF(0)	3	I/O	Grounded to indicate that the module is present
7	Rate Select	3	Output	Select Between Full or Reduced Receiver Bandwidth
8	LOS	3	Output	Loss of Signal
9	RGND	1		Receiver Ground
10	RGND	1		Receiver Ground
11	RGND	1		Receiver Ground
12	-RX_DAT	3	Output	Differential receiver outputs.
13	+RX_DAT	3	Output	Differential receiver outputs.
14	RGND	1		Receiver Ground
15	VCCR	2	Input	Receiver power supply
16	VCCT	2	Input	Transmitter power supply
17	TGND	1		Transmitter Ground
18	+TX_DAT	3	Input	Differential transmitter inputs.
19	-TX_DAT	3	Input	Differential transmitter inputs.
20	TGND	1		Transmitter Ground

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Host Board Layout

A typical host board mechanical layout for attaching the SFP Connector and Cage System is shown in Figures 1 and 2.

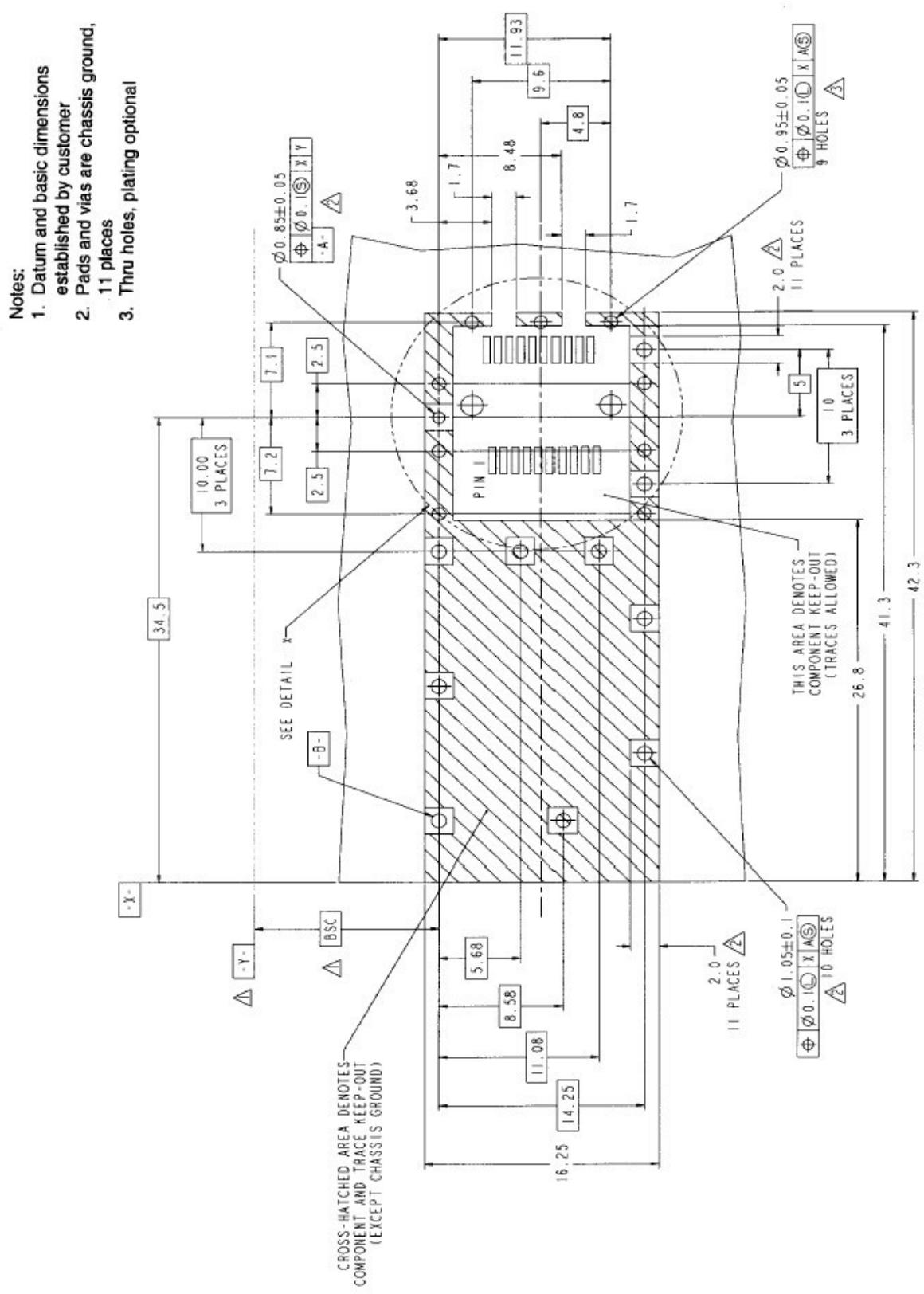


Figure 1 SFP Host Board Mechanical Layout

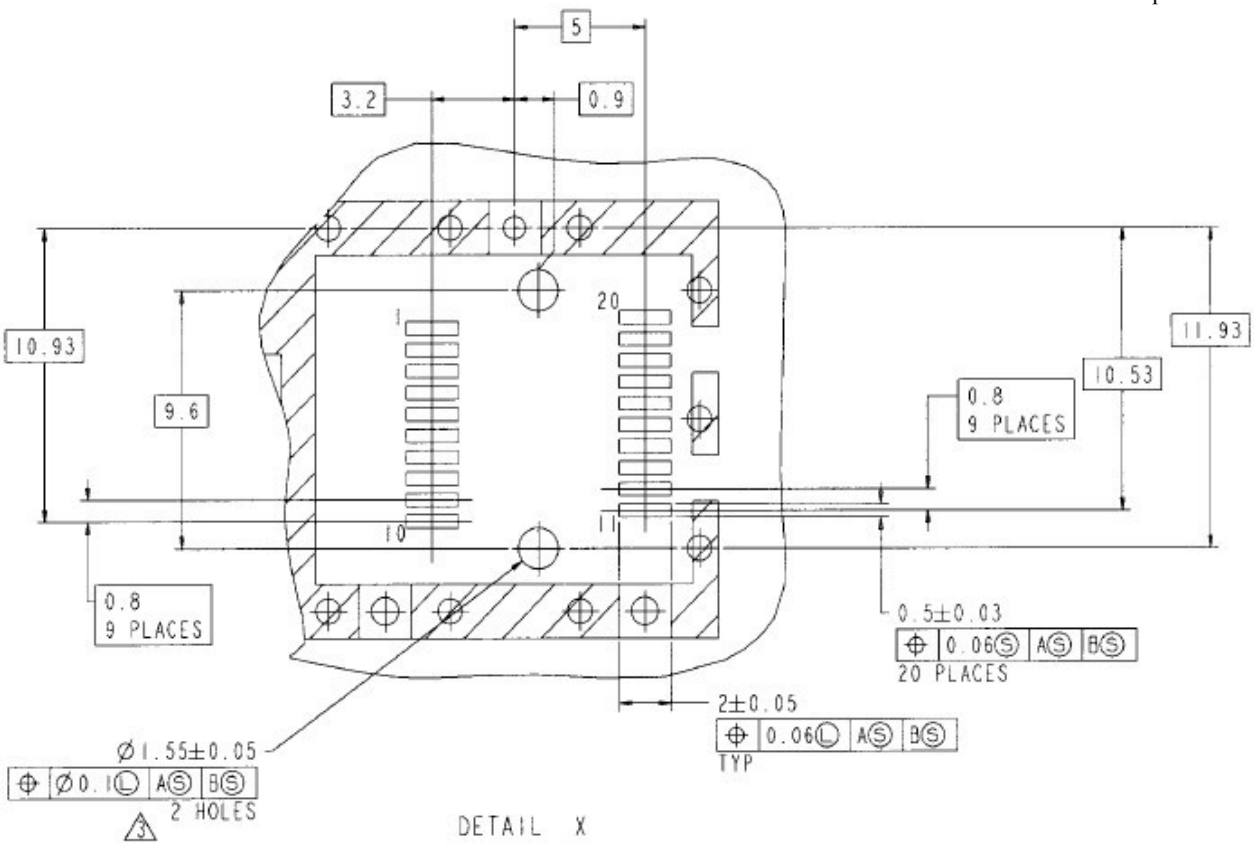
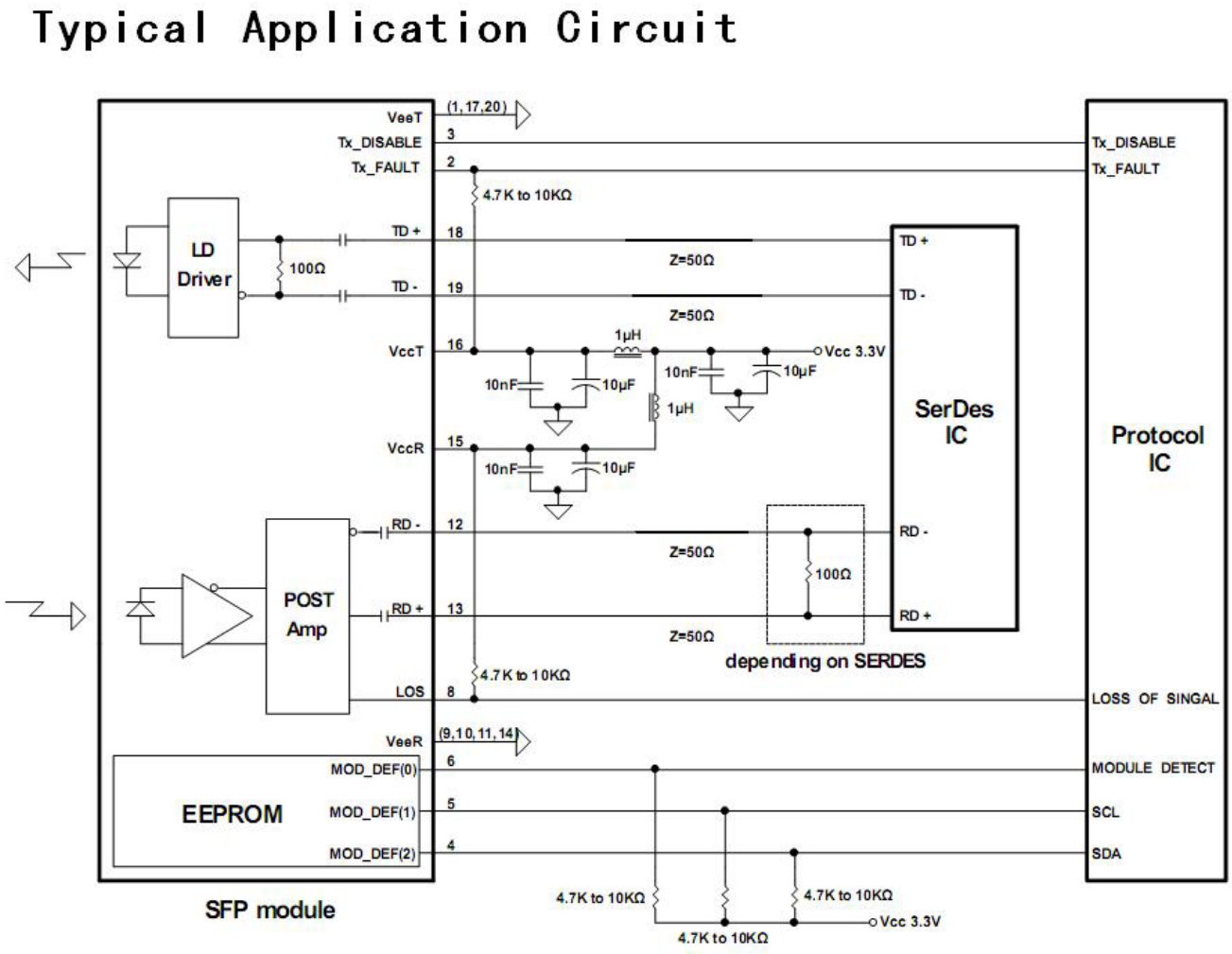
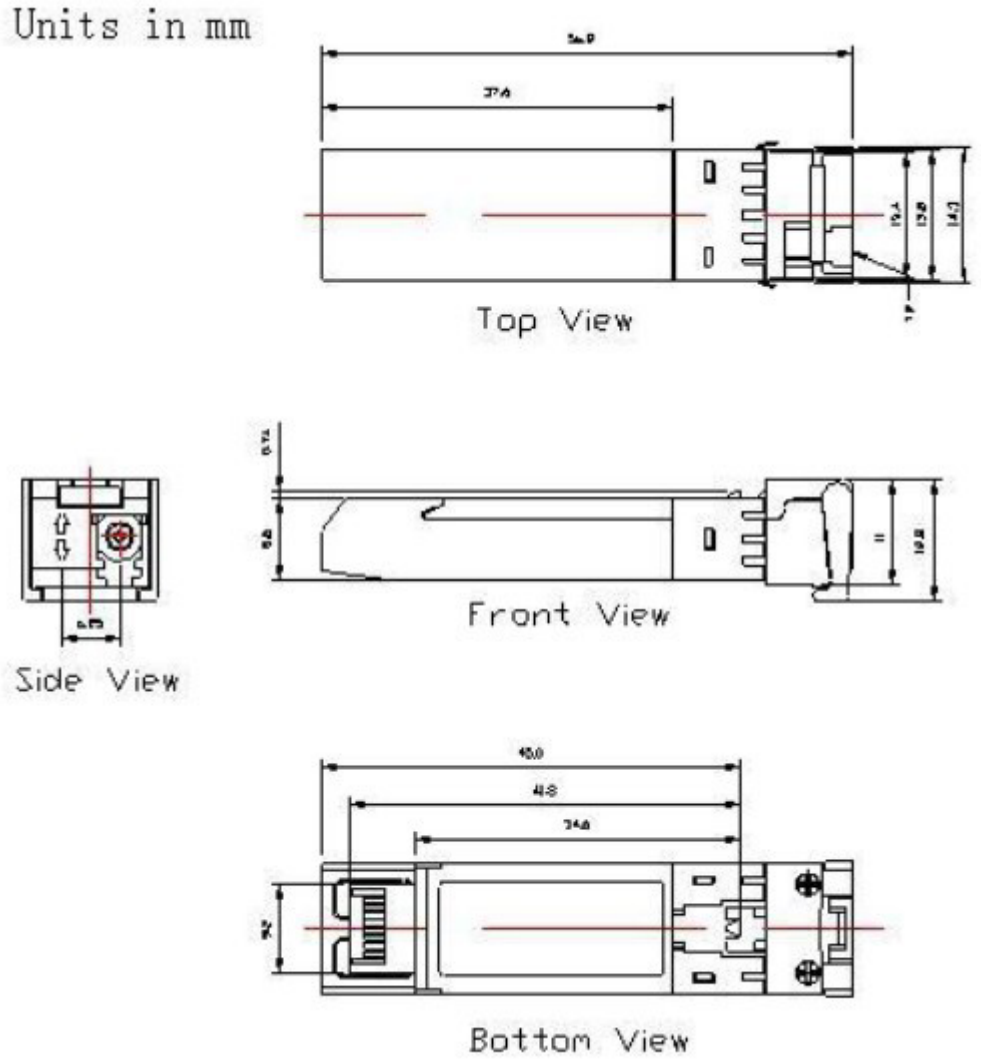


Figure 2 SFP Host Board Mechanical Layout (Cont.)

Recommended Circuit Schematic



Module Outline Drawing



Note: Specifications subject to change without notice.