

NTR-861XLI-CWDM

Product Description

Neton's NTR-861XLI-CWDM series of transceiver modules are the perfect solution for high-speed communication networks.

These transceiver modules support data rates up to 1.5Gbps. The module is fully compliant with Small Form-Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA).

These transceiver modules provides the system designer with Telecom, Datacom, and other Fibre Channel applications.



Order Information

Type	Fiber Type	Wavelength(nm)	Fiber Length(Km)
NTR-8612LI(1310CT/1550R)	SM	1310	20
NTR-8613LI(1550CT/1310R)	SM	1550	20

Note: 1.The suffix “-I” denote the extended level.

2.The suffix “-L” denote the optical interface is LC connector on the left

Product Features

- 1310 and 1550 CWDM Laser Diode Transmitter
- Up to 20 Km on 9/125μm SMF
- 3.3V power supply
- LC single optical interface
- CML Differential Input /Output and LVTTTL signal detect
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Operating case temperature range (Standard: 0 to +70°C) or (Extended: -20°C to +85°C)

1.25G SFP BIDI CWDM Transceiver Module NTR-861XLI-CWDM

Application

- Fiber Channel Switch Infrastructure
- Gigabit Ethernet Switches and Routers
- Other optic link

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	Note
Storage Temperature	T _{ST}	-40	+85	°C	-
Relative Humidity	RH	5	95	%	-
Supply Voltage	V _{CC}	0	+3.6	V	-

Table 2--- Recommended Operating Environment and Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Note
Supply Voltage	V _{CC}	+3.1	+3.3	+3.5	V	-
Supply Current	I _{CC}	-	-	260	mA	-
Operating Case Temperature	T _{OP}	0	-	+70	°C	1
		-20	-	+85		2
Data Rate	B	100	1250	1500	Mbps	-

Note 1.Standard level
2.Extended level

Optical Parameters

Table 3--- NTR-8612LI(1310CT/1550R) Transceiver Optical Characteristics
(Ambient Operating Temperature $T_a=+25\pm5^\circ\text{C}$, $V_{CC} = 3.3\pm0.2\text{V}$)

Parameter	Symbol	Min	Typ	Max	Units	Note
Transmitter						
Data rate	B	100	1250	1500	Mbps	-
Output Center Wavelength	λ_c	1307	1310	1313	nm	-
Output Spectral width (-20dB)	λ	-	-	1	nm	-
Average Optical Output Power	P_o	-5	-	0	dBm	1,2
Extinction Ratio	ER	8.2	-	-	dB	1,2
Optic Output Eye: Compliant IEEE802.3						1,2
Receiver						
Receiver Sensitivity	P_{\min}	-	-	-23	dBm	1,2
Receiver Saturation	P_{\max}	-3	-	-	dBm	1,2
Operation Center Wavelength	λ_c	1500	1550	1600	nm	-
Loss of Signal	Assert	LOS_A	-35	-	dBm	1,2
	Deassert	LOS_D	-	-23	dBm	1,2
LOS Hysteresis	$LOSHYS$	0.5	-	-	dB	-

Note1: The optical power is launched into 9/125 μm SMF.

Note2: With a PRBS $2^{23}-1$ test pattern@ 1250Mbps.

Table 4--- NTR-8613LI(1550CT/1310R) Transceiver Optical Characteristics
(Ambient Operating Temperature $T_a=+25\pm5^\circ\text{C}$, $V_{CC} = 3.3\pm0.2\text{V}$)

Parameter	Symbol	Min	Typ	Max	Units	Note
Transmitter						
Data rate	B	100	1250	1500	Mbps	-
Output Center Wavelength	λ_c	1547	1550	1553	nm	-
Output Spectral width (-20dB)	λ	-	-	1	nm	-
Average Optical Output Power	P_o	-5	-	0	dBm	1,2
Extinction Ratio	ER	8.2	-	-	dB	1,2
Optic Output Eye: Compliant IEEE802.3						1,2
Receiver						
Receiver Sensitivity	P_{\min}	-	-	-23	dBm	1,2
Receiver Saturation	P_{\max}	-3	-	-	dBm	1,2
Operation Center Wavelength	λ_c	1260	1310	1360	nm	-
Loss of Signal	Assert	LOS_A	-35	-	dBm	1,2
	Deassert	LOS_D	-	-23	dBm	1,2
LOS Hysteresis	$LOSHYS$	0.5	-	-	dB	-

Note1: The optical power is launched into 9/125 μm SMF.

Note2: With a PRBS $2^{23}-1$ test pattern@ 1250Mbps.

Electrical Parameters

Table 5--- Transceiver Electrical Characteristics

(Ambient Operating Temperature $T_a = +25 \pm 5^\circ\text{C}$, $V_{CC} = 3.3 \pm 0.2\text{V}$)

Parameter		Symbol	Min	Typ	Max	Units	Note
Supply Voltage		V _{CC}	+3.1	+3.3	+3.5	V	-
Supply Current		I _{CC}	-	-	260	mA	-
Transmitter							
Differential Input Voltage		V _{in}	400	-	2000	mV _{P-P}	-
Input Differential Impedance		Z _{in}	90	100	110	Ω	-
TX_DISABLE	Disable	VD	2.0	-	V _{cc}	V	-
	Enable	VEN	0	-	0.8		-
TX_Fault	Fault	VF	2.0		V _{CC}	V	-
	Normal	VN	0	-	0.8		-
Receiver							
Differential Output Voltage		V _{OUT}	400	-	2000	mV _{P-P}	-
RX_LOS	Fault	V _F	2.0	-	V _{cc}	V	-
	Normal	V _N	0	-	0.8		-

Digital diagnostic monitoring Characteristics

Table 6--- Digital diagnostic monitoring Characteristics

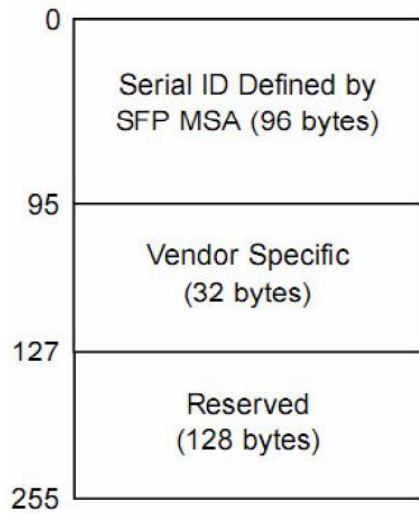
Parameter	Symbol	Range	Accuracy	Note
Transceiver Internal Temperature	T	Recommended Operation Condition	$\pm 3^\circ\text{C}$	-
Transceiver Internal Supply Voltage	V_{CC}	Recommended Operation Condition	$\pm 3\%$	-
Laser Bias Current	I_D	$I_D: 1-100\text{mA}$, Recommended Operation Condition	$\pm 10\%$	-
TX Output Power	P_O	$P_O: \text{min} \sim \text{max}$ dBm, Recommended Operation Condition	$\pm 3\text{dBm}$	-
RX Input Power	P_I	$P_I: \text{min} \sim \text{max}$ dBm, Recommended Operation Condition	$\pm 3\text{dBm}$	-

EEPROM Information Functions

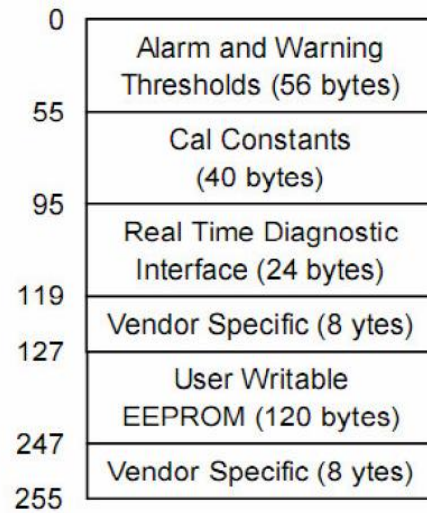
Serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

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.

Defines a 256 byte memory map in E2PROM 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). The interface is identical to, and compatible with both the GBIC Specification and the SFP Multi Source Agreement. The complete interface is described in "Digital Diagnostics Monitoring Interface for SFF Optical Transceivers".



2 wire address 1010000x (A0h)



2 wire address 1010001x (A2h)

EPROM Serial ID Memory Contents:

Table 7--- Serial ID Memory Map:A0h

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	1250Mbps
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-861XLI-CWDM"
56-59	4	Vendor rev	
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	Vendor Specific EEPROM
128-255	128	Reserved	Reserved for SFF-8079

Pin Definitions

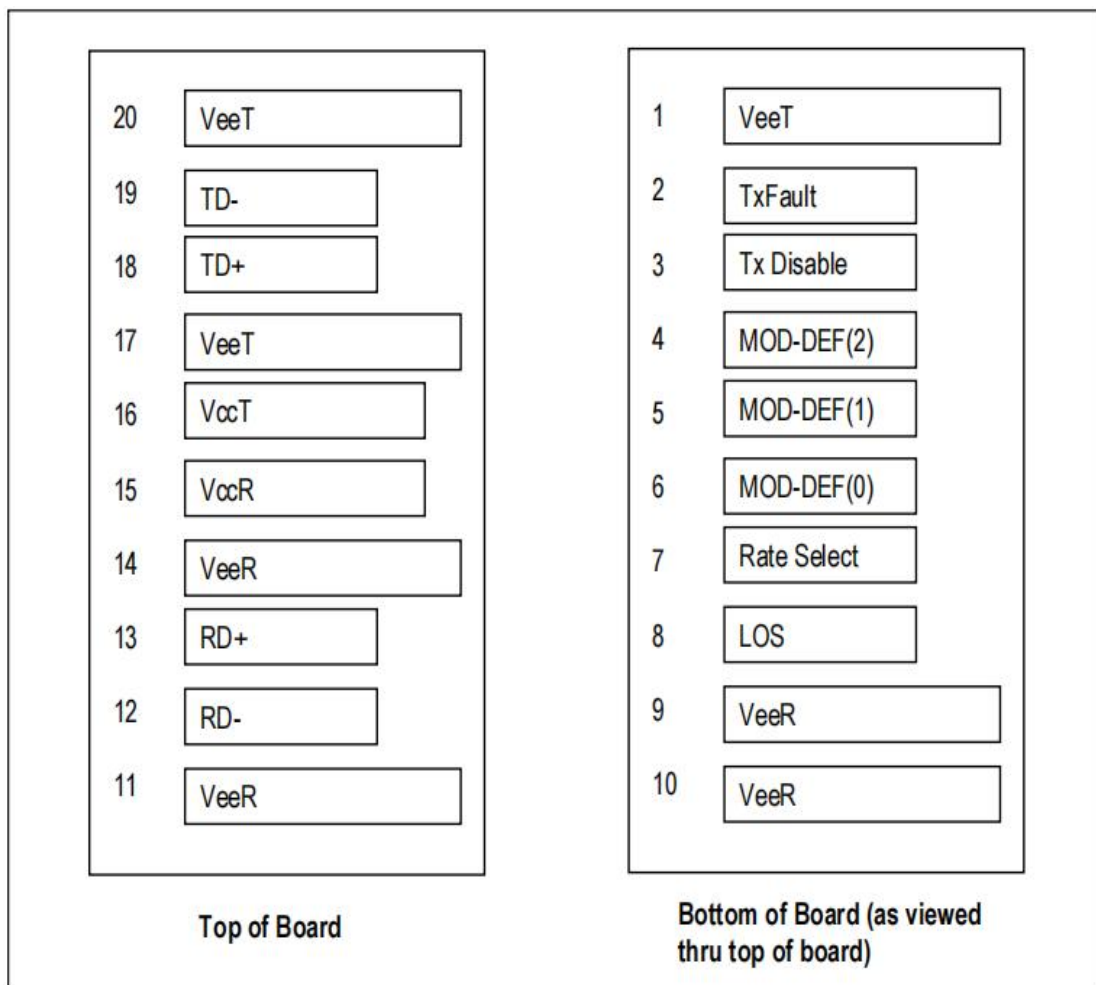


Table 8---Connector pin assignment

Pin #	Pin Name	Plug Seq.	Description	Note
1	VeeT	1	Transmitter Ground	6
2	TX Fault	3	Transmitter Fault Indication	1
3	TX Disable	3	Transmitter Disable	2
4	MOD_DEF(2)	3	SDA Serial Data Signal	3
5	MOD_DEF(1)	3	SCL Serial Clock Signal	3
6	MOD_DEF(0)	3	Grounded to indicate that the module is present	3
7	Rate Select	3	Not in used	4
8	LOS	3	Loss of Signal	5
9	VeeR	1	Receiver Ground	6
10	VeeR	1	Receiver Ground	6
11	VeeR	1	Receiver Ground	6
12	RD-	3	Inv. Received Data Out	8
13	RD+	3	Received Data Out	8
14	VeeR	1	Receiver Ground	6
15	VccR	2	Receiver Power	7
16	VccT	2	Transmitter Power	7
17	VeeT	1	Transmitter Ground	6
18	TD+	3	Transmit Data In	9
19	TD-	3	Inv. Transmit Data In	9
20	VeeT	1	Transmitter Ground	6

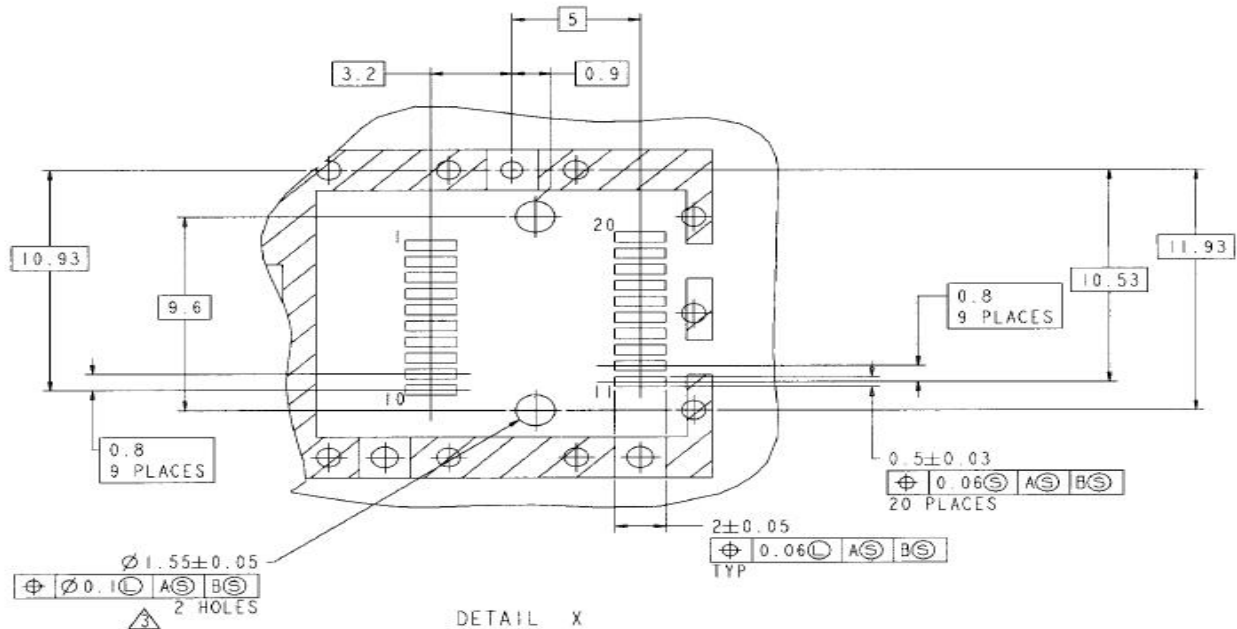
Plug Seq.: Pin engagement sequence during hot plugging.

Note:

- TX_Fault is an open collector/drain output, which should be pulled up with a $4.7\text{K}\Omega$ — $10\text{K}\Omega$ resistor on the host board. Pull up voltage between 2.0V and V_{CCT} , $R+0.3\text{V}$. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to $< 0.8\text{V}$.
- TX_Disable is an input that is used to shut down the transmitter optical output. Its states are:
Low (0 – 0.8V): Transmitter on
($>0.8, < 2.0\text{V}$): Undefined
High ($2.0 - V_{CC}$): Transmitter Disabled
Open: Transmitter Disabled
- Mod-Def 0, 1, 2. These are the module definition pins. They should be pulled up with a $4.7\text{K}\Omega$ — $10\text{K}\Omega$ resistor on the host board. The pull-up voltage shall be V_{CCT} or V_{CCR} .

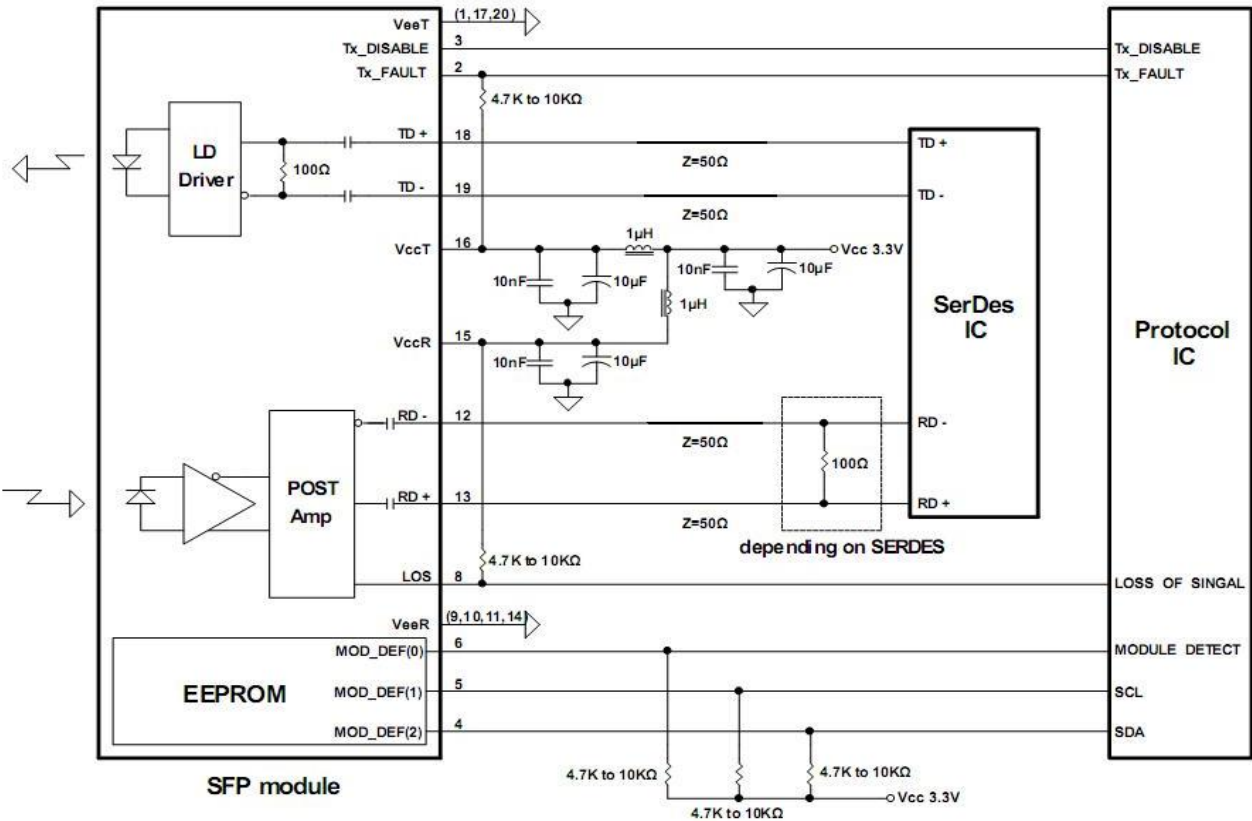
Mod-Def 0 is grounded by the module to indicate that the module is present

- Page 8



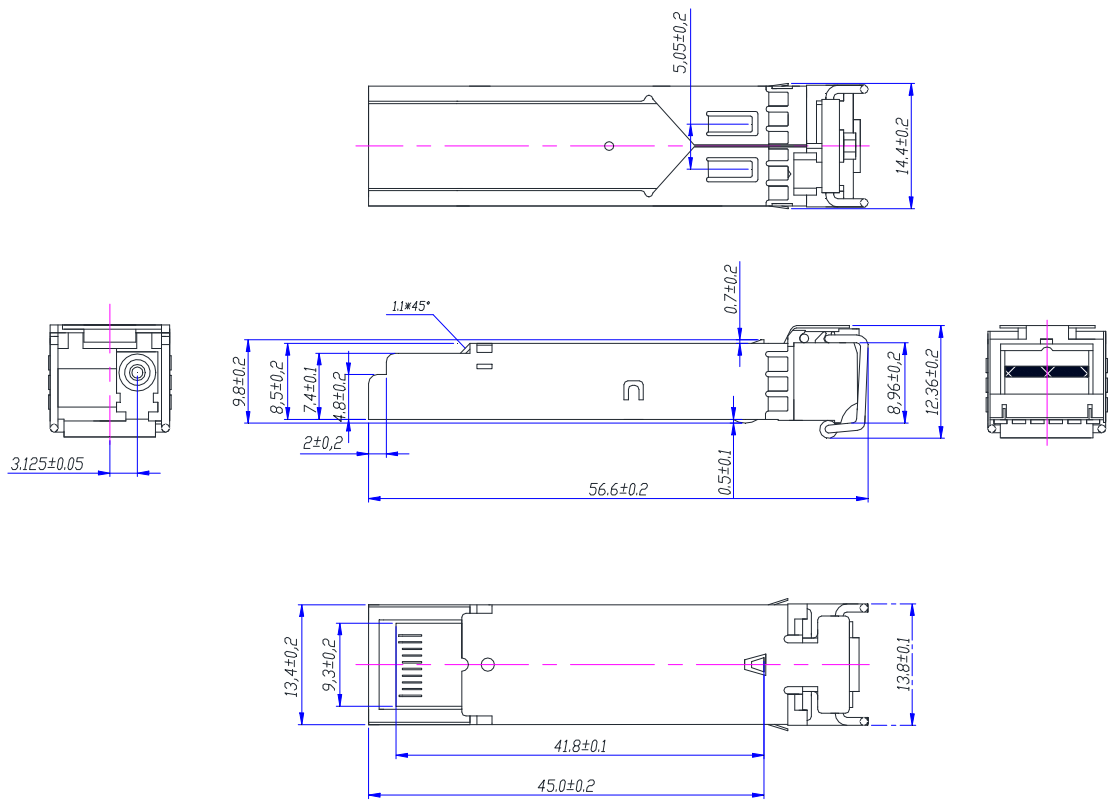
SFP Host Board Mechanical Layout (Cont.)

Recommended Circuit Schematic

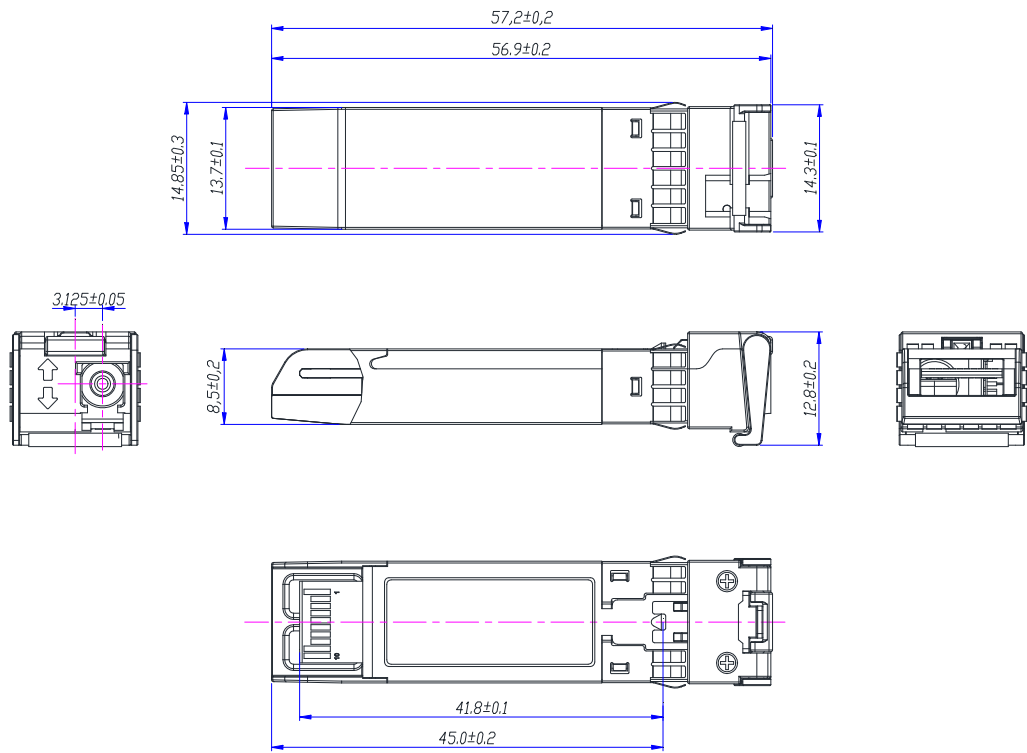


Recommended Circuit Schematic

Module Outline Drawing (Units in mm)



LC receptacle TYPE1



LC receptacle TYPE2

Note: Specifications subject to change without notice.