

### SFP-1GB-BX47-U-80-I-C

MSA and TAA 1000Base-BX SFP Transceiver (SMF, 1490nmTx/1570nmRx, 80km, LC, DOM, -40 to 85C)

#### Features:

- INF-8074 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Industrial Temperature -40 to 85 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### Applications:

- 1000Base-BX Ethernet
- 1x Fibre Channel
- Access (FTTx) and Enterprise

#### Product Description

This MSA Compliant SFP transceiver provides 1000Base-BX throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1490nmTx/1570nmRx via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS: compliant with EU RoHS 2.0 directive 2015/863/EU.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	Tstg	-40		85	°C
Operating Case Temperature	Tc	-40		85	°C
Operating Humidity	RH	5		85	%
Data Rate (GBE)	DR		1.25		Gbps
Data Rate (FC)	DR		1.063		Gbps

## Electrical Characteristics (TOP=25°C, Vcc=3.3 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.15	3.30	3.47	V	
Power Supply Current	Icc			300	mA	
Power Dissipation	P <sub>DISS</sub>			1	W	
<b>Transmitter</b>						
LVPECL Differential Inputs	VIN	400		1800	mVp-p	1
Input Differential Impedance	ZIN	90	100	110	Ω	2
Tx_Disable	Disable	2		Vcc+0.3	V	
	Enable	0		0.8	V	
Tx_Fault	Fault	2		Vcc+0.3	V	
	Normal	0		0.8	V	
<b>Receiver</b>						
LVPECL Differential Outputs	VOUT	400		2000	mVp-p	1
Output Differential Impedance	ZOUT	90	100	110	Ω	
Tx_Disable Assert Time	T <sub>off</sub>			10	us	
Rx_LOS	LOS	2		Vcc+0.3	V	
	Normal	0		0.8	V	
MOD_DEF (0.2)	VOH	2.5		Vcc+0.3	V	3
	VOL	0		0.5	V	3

**Notes:**

1. AC coupled inputs.
2. RIN > 100kΩ @ DC.
3. With Serial ID.

**Optical Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes	
<b>Transmitter</b>							
Optical Power (Average)	$P_{AVE}$	0		5	dBm	1	
Optical Extinction Ratio	ER	9			dB		
Center Wavelength	$\lambda_C$	1470	1490	1510	nm		
Spectral Width (-20dB)	$\Delta\lambda$			1	nm		
Side-Mode Suppression Ratio	SMSR	30			dB		
Rise/Fall Time (20-80%)	$T_r/T_f$			0.26	ns		
POUT @ Tx_Disable Asserted	POUT			-35	dBm		
Output Optical Eye		Compliant with IEEE 802.3					2
<b>Receiver</b>							
Receiver Sensitivity (Average)	$R_{AVE}$			-24	dBm	3	
Receiver Overload	$P_{max}$	-3			dBm		
Receiver Wavelength	$R\lambda$	1550	1570	1590	nm		
LOS De-Assert	LOSD			-25	dBm		
LOS Assert	LOSA	-35			dBm		
LOS Hysteresis		0.5			dB		

**Notes:**

1. Output power is power coupled into a 9/125μm single-mode fiber.
2. Filtered. Measured with a PRBS 2<sup>7</sup>-1 test pattern @1250Mbps.
3. Minimum average optical power is measured at BER less than 1E<sup>-12</sup> with 1.25Gbps, 2<sup>7</sup>-1 PRBS, and ER=9dB.

## Pin Descriptions

Pin	Symbol	Name/Description	Note
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault. LVTTTL-O.	2
3	Tx_Disable	Transmitter Disable. Laser output disabled on “high” or “open.” LVTTTL-I.	3
4	SDA	2-Wire Serial Interface Data (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O.	
5	SCL	2-Wire Serial Interface Clock (Same as MOD-DEF2 in INF-8074i). LVTTTL-I.	
6	MOD_ABS	Module Absent. Connect to VeeT or VeeR in the module.	4
7	RS0	Rate Select 0. Not Used.	5
8	LOS	Loss of Signal indication. “Logic 0” indicates normal operation. LVTTTL-O.	2
9	RS1	Rate Select 1. Not Used.	5
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Receiver Inverted Data Out. AC Coupled. CML-O.	
13	RD+	Receiver Non-Inverted Data Out. AC Coupled. CML-O.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground (Common with Receiver Ground).	1
18	TD+	Transmitter Non-Inverted Data In. AC Coupled. CML-I.	
19	TD-	Transmitter Inverted Data In. AC Coupled. CML-O.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

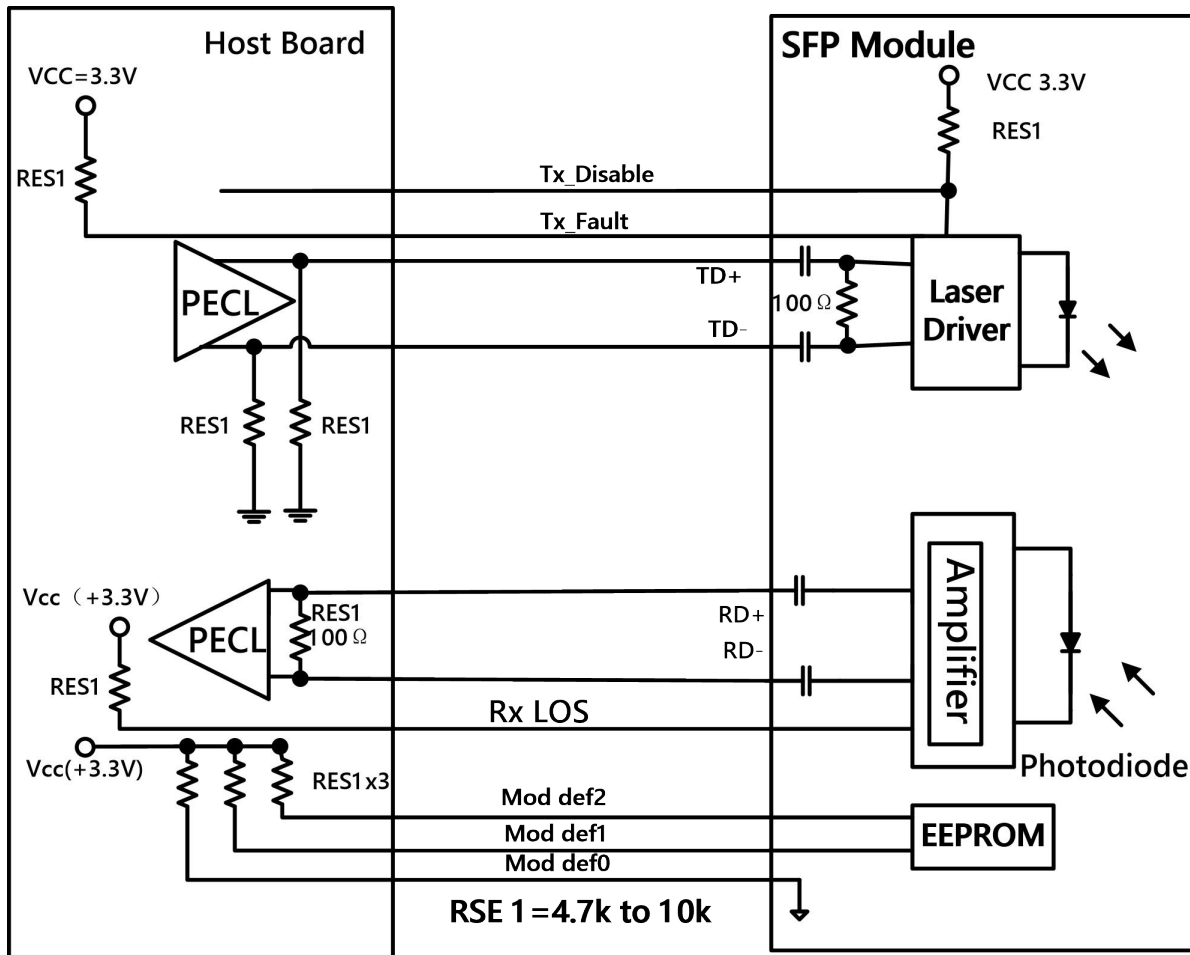
### Notes:

1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
2. This contact is an open collector/drain output and should be pulled up to the Host\_Vcc with resistor in the range 4.7kΩ to 10kΩ. Pull-ups can be connected to one or several power supplies; however, the host board design shall ensure that no module contract has voltage exceeding module VccT/R+0.5V.
3. Tx\_Disable is an input contact with a 4.7kΩ to 10kΩ pull-up resistor to the VccT inside the module.
4. MOD\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull the contact up to the Host\_Vcc with a resistor in the range from 4.7kΩ to 10kΩ. MOD\_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.
5. Internally pulled down per SFF-8431.

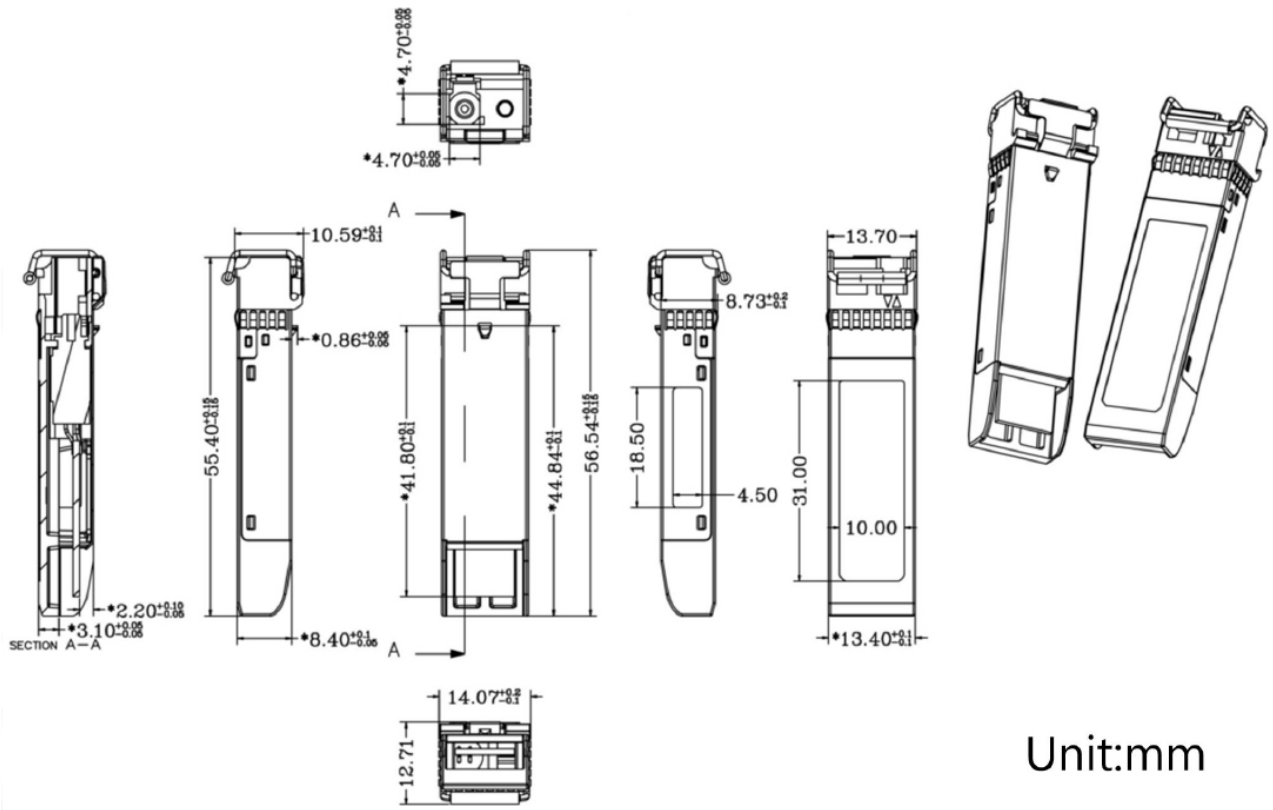


Pin-Out of Connector Block on the Host Board

**Recommended Circuit Schematic**



## Mechanical Specifications



## EEPROM Information

EEPROM memory map-specific data field description is as below:

2 wire address 1010000X (A0h)		2 wire address 1010001X (A2h)	
0	Serial ID Defined by SFP MSA (96 bytes)	0	Alarm and Warning Thresholds (56 bytes)
95		55	Cal Constants (40 bytes)
127		95	Real Time Diagnostic Interface (24 bytes)
	Vendor Specific (32 bytes)	119	Vendor Specific (8 bytes)
	Reserved, SFF8079 (128 bytes)	127	User Writable EEPROM (120 bytes)
		247	
255			255

## **About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## **Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## **Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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