SFP-1GB-BX91-D-120-C-C

Cisco® Compatible TAA 1000Base-BX SFP Transceiver (SMF, 1590nmTx/1510nmRx, 120km, LC, DOM)

Features:

- Operating Data Rate up to 1.25Gbps
- 120km with 9/125μm SMF
- Single 3.3V Power Supply
- Hot-Pluggable SFP
- Compliant with SFF-8472
- Compliant with MSA SFP Specifications
- Class 1 Laser Safety Compliant
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free

Applications:

- 1000Base-BX Ethernet
- Access and Enterprise

Product Description

This Cisco® SFP-1GB-BX91-D-120-C compatible SFP transceiver provides 1000Base-BX throughput up to 120km over single-mode fiber (SMF) using a wavelength of 1590nmTx/1510nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Cisco®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. 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.")

Rev. 111125

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate			1.063/1.25		Gbps	
Operating Temperature	Tc	0		70	°C	
Storage Temperature	Tstg	-40		+85	°C	
Operating Relative Humidity	RH	5		85	%	
Power Supply Voltage	Vcc	-0.5		3.6	V	
Power Budget			32		dB	

Notes:

1. Exceeding any one of these values may destroy the device permanently.

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
CML Differential Inputs		VIN	400		1800	mVp-p	1
Input AC Common-Mode Voltage			0		25	mV	2
Input Differential Impedance		ZIN	90	100	110	Ω	3
Tx_Disable	High		2		Vcc+0.3	V	
	Low		0		0.8		
Tx_Fault	High		2		Vcc+0.3	V	4
	Low		0		0.8		5
Receiver							
CML Differential Outputs		VOUT	400		2000	mVp-p	6
Output Differential Impedance		ZOUT	90	100	110	Ω	
Rx_LOS	High		2		Vcc+0.3		4
	Low		0		0.8		5
MOD_DEF (0.2)		VOH	2.5		Vcc+0.3	V	7
		VOL	0		0.5		

Notes:

1. AC coupled inputs.
2. RMS.
3. RIN > 100kΩ @DC.
4. lo = 400µA; Host_Vcc.
5. lo = -4.0mA.
6. AC coupled outputs.
7. With serial ID.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Operating Wavelength	λ	1570	1590	1610	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Average Output Power	POUT	0		5	dBm	1
Extinction Ratio	ER	9			dB	
Average Power of Off Transmitter	Poff			-45	dBm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Tx_Disable Assert Time	T_off			10	us	
Output Optical Eye	Compliant with IEEE 802.3					2
Receiver						
Center Wavelength	λC	1490	1510	1530	nm	
Receiver Sensitivity	Pmin			-32	dBm	3
Receiver Overload	Pmax	-9			dBm	
LOS De-Assert	LOSD			-34	dBm	
LOS Assert	LOSA	-45			dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Output is coupled into a 9/125µm SMF.
2. Filtered, measured with a PRBS 2^7-1 test pattern @1.25Gbps.
3. Measured with ER=9, BER less than $1E^{-12}$, and PRBS 2^7-1 @1.25Gbps.

Pin Descriptions

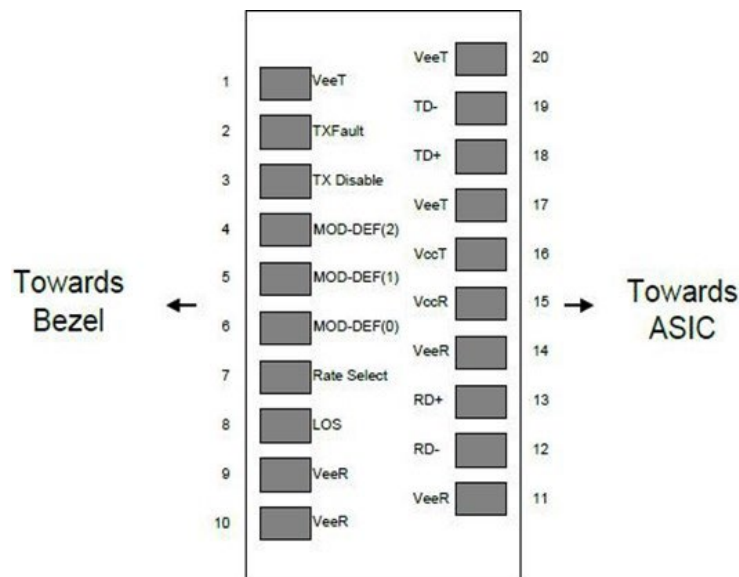| Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	5
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable. Module disables on "high" or "open."	3	2
4	MOD_DEF2	Module Definition 2. 2-Wire Serial ID Interface.	3	3
5	MOD_DEF1	Module Definition 1. 2-Wire Serial ID Interface.	3	3
6	MOD_DEF0	Module Definition 0. Grounded within the module.	3	3
7	Rate Select	Not Connected. Function not available.	3	
8	LOS	Loss of Signal.	3	4
9	VeeR	Receiver Ground.	1	5
10	VeeR	Receiver Ground.	1	5
11	VeeR	Receiver Ground.	1	5
12	RD-	Inverted Received Data Out.	3	6
13	RD+	Received Data Out.	3	7
14	VeeR	Receiver Ground.	1	5
15	VccR	3.3 ± 5% Receiver Power.	2	7
16	VccT	3.3 ± 5% Transmitter Power.	2	7
17	VeeT	Transmitter Ground.	1	5
18	TD+	Transmit Data In.	3	8
19	TD-	Inverted Transmit Data In.	3	8
20	VeeT	Transmitter Ground.	1	5

Notes:

1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. When "high," the output indicates a laser fault of some kind. "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up in the module with a 4.7kΩ to 10kΩ resistor. The states are:
    Low (0V – 0.8V): Transmitter On
    (>0.8V, <2.0V): Undefined
    High (2.0V – 3.465V): Transmitter Disabled
    Open: Transmitter Disabled.
3. MOD_DEF0, 1, & 2. These are module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board.
    MOD_DEF0 is grounded by the module to indicate that the module is present.
    MOD_DEF1 is the clock line of 2-wire serial interface for serial ID.
    MOD_DEF2 is the data line of 2-wire serial interface for serial ID.
4. LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor. When "high," this output indicates that the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.
5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100 differential lines which
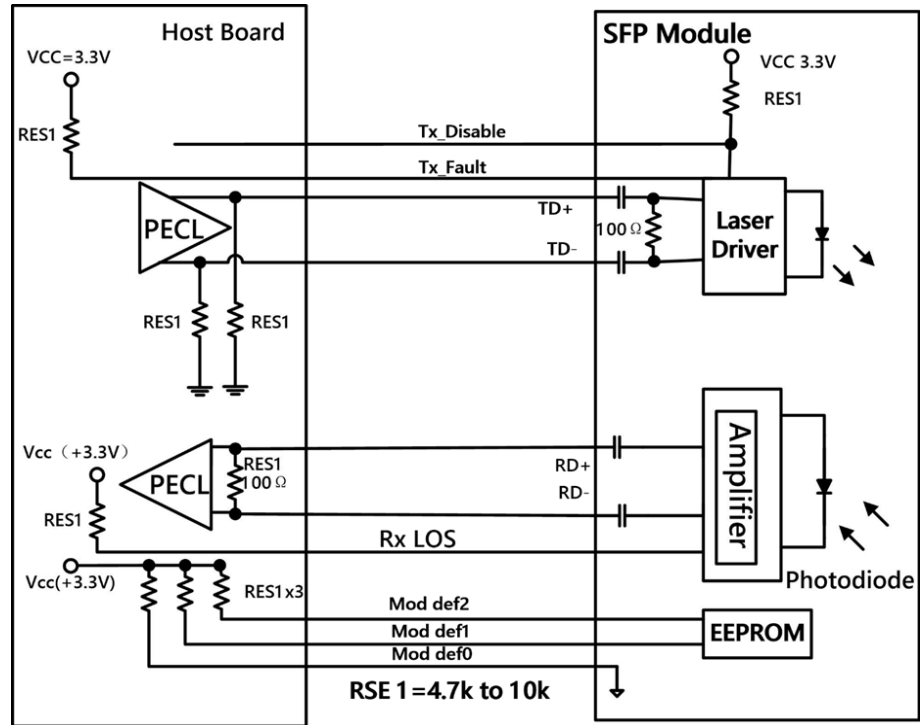
should be terminated with 100 (differential) at the user SERDES. The voltage swing on these lines will be between 400mV and 2000mV differential (200mV and 1000mV single-ended) when properly terminated.

7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. Maximum supply current is 300mA. VccR and VccT may be internally connected within the SFP module.

8. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module. The inputs will accept differential swings of 400mV to 2000mV (200mV to 1000mV single-ended).
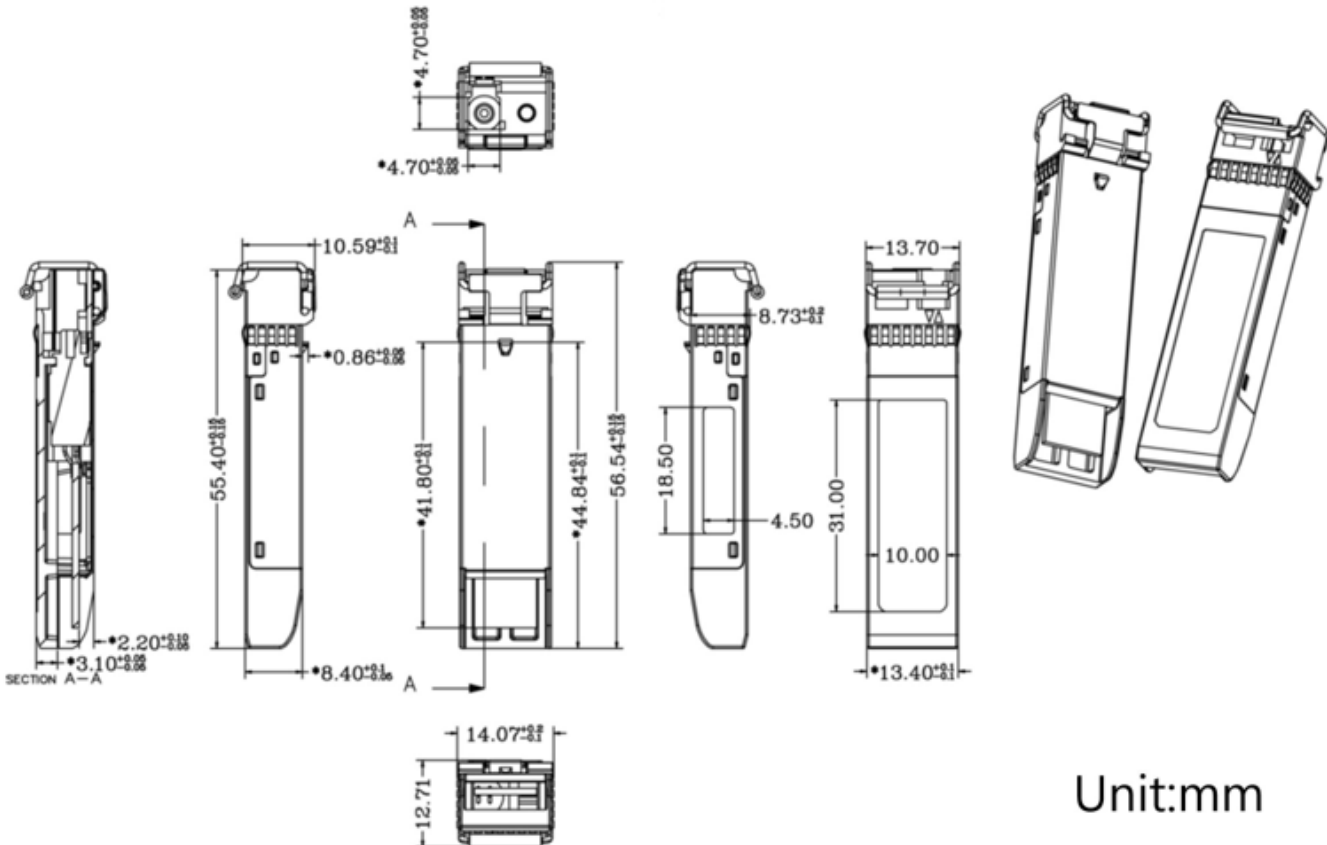
Pin-Out Details

Recommended Circuit Schematic

Host Board

VCC=3.3V

RES1

Tx_Disable

Tx_Fault

PECL

TD+

TD-

100 Ω

RES1   RES1

Vcc（+3.3V）

RES1
100 Ω

PECL

RES1

RD+

RD-

Rx LOS

Vcc(+3.3V)

RES1 x3

Mod def2

Mod def1

Mod def0

RSE 1 =4.7k to 10k

SFP Module

VCC 3.3V

RES1

Laser Driver

Amplifier

Photodiode

EEPROM

Mechanical Specifications

Unit:mm

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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