SFP-1000BASE-EZX-160-I-C-C

Cisco® Compatible TAA 1000Base-ZX SFP Transceiver (SMF, 1550nm, 160km, LC, DOM, -40 to 85C)

Features:

- Duplex LC Connector
- Operating Data Rate up to 1.25Gbps
- 1550nm DFB Laser Transmitter
- Class 1 Laser Safety Complaint
- Single 3.3V Power Supply and LVTTL Logic Interface
- Hot-Pluggable
- Operating Temperature: -40 to 85 Celsius
- RoHS Compliant and Lead-Free
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free

Applications:

- 1000Base-ZX Ethernet
- 1x Fibre Channel
- Access and Enterprise

Product Description

This Cisco® compatible SFP transceiver provides 1000Base-ZX throughput up to 160km over single-mode fiber (SMF) using a wavelength of 1550nm via an LC connector. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. 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.")

TAA COMPLIANT

Rev. 100725

Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature		Tc	-40		85	°C	
Storage Temperature		Tstg	-40		85	°C	
Relative Humidity		RH			95	%	
Data Rate	**GBE**	DR		1.25		Gbps	
	FC			1.063			
9μm Core Diameter SMF		L		160		km	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.15	3.3	3.45	V	
Power Supply Current		Icc			300	mA	
Transmitter							
LVPECL Differential Input		VIN	500		2400	mVp-p	1
Input Differential Impedance		ZIN	85	100	115	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	
Receiver							
LVPECL Differential Output		VOUT	370		2000	mVp-p	3
Output Differential Impedance		ZOUT	85	100	115	Ω	
Rx_LOS	**LOS**		2		Vcc+0.3	V	
	Normal		0		0.8	V	
MOD_DEF(0.2)		VOH	2.5			V	
		VOL	0		0.8	V	4

Notes:

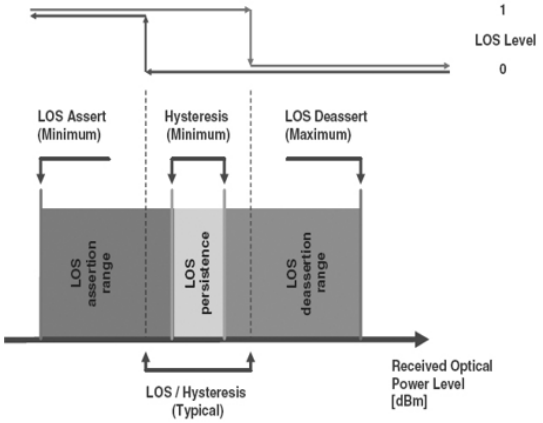
1. AC coupled inputs. LVPECL logic. Internally AC coupled.
2. RIN > 100kΩ @DC.
3. AC coupled outputs. LVPECL logic. Internally AC coupled.
4. With serial ID.

Optical Characteristics

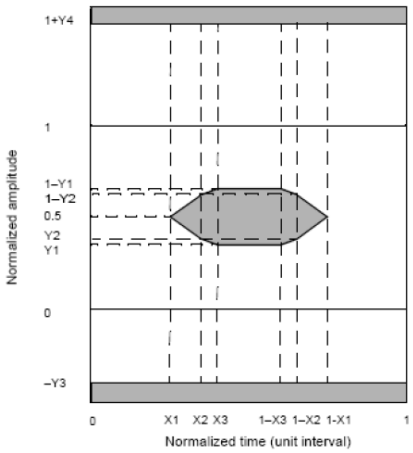
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λC	1500	1550	1580	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Average Output Power	POUT	3		7	dBm	1
Side-Mode Suppression Ratio	SMSR	30			dB	2
Extinction Ratio	ER	9			dB	
Rise/Fall Time (20-80%)	Tr/Tf			0.26	ns	
POUT @Tx_Disable Asserted	POUT			-45	dBm	
Total Jitter	TJ			0.43	UI	
Tx Disable Assert Time	Toff			10	us	
Output Optical Eye	Compliant with IEEE 802.3ah-2004					2, 6
Receiver						
Center Wavelength	λC	1260		1600	nm	
Receiver Sensitivity	Pmin			-37	dBm	3
Receiver Overload	Pmax	-10			dBm	
Return Loss		12			dB	
Optical Path Penalty				1	dB	4
LOS Assert	LOSA	-45			dBm	
LOS De-Assert	LOSD			-38	dBm	
LOS Hysteresis	LOSH	0.5			dB	5

Notes:

1. Output is coupled into a 9/125μm SMF.
2. Filtered, measured with a PRBS 2^7-1 test pattern @1.25Gbps.
3. Minimum average optical power is measured at BER less than $1E^{-12}$ with a 2^7-1 NRZ PRBS and ER=9dB.
4. Measured with a PRBS 2^7-1 test pattern @1.25Gbps, G.652 SMF, BER ≤1×10^{-10}.
5. LOS Hysteresis.



6. Eye Pattern Mask.



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	SDA. 2-Wire Serial ID Interface.	3	3
5	MOD_DEF1	SCL. 2-Wire Serial ID Interface.	3	3
6	MOD_DEF0	MOD_ABS. Grounded within the module.	3	3
7	Rate Select	No User Connection. 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-	Receiver Inverse Data Out.	3	6
13	RD+	Receiver 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+	Transmitter Data In.	3	8
19	TD-	Transmitter Inverse 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. Pull-up voltage between 2.0V and VccT/R+0.3V. When “high,” output indicates a laser fault of some kind. “Low” indicates normal operation. In the “low” state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:

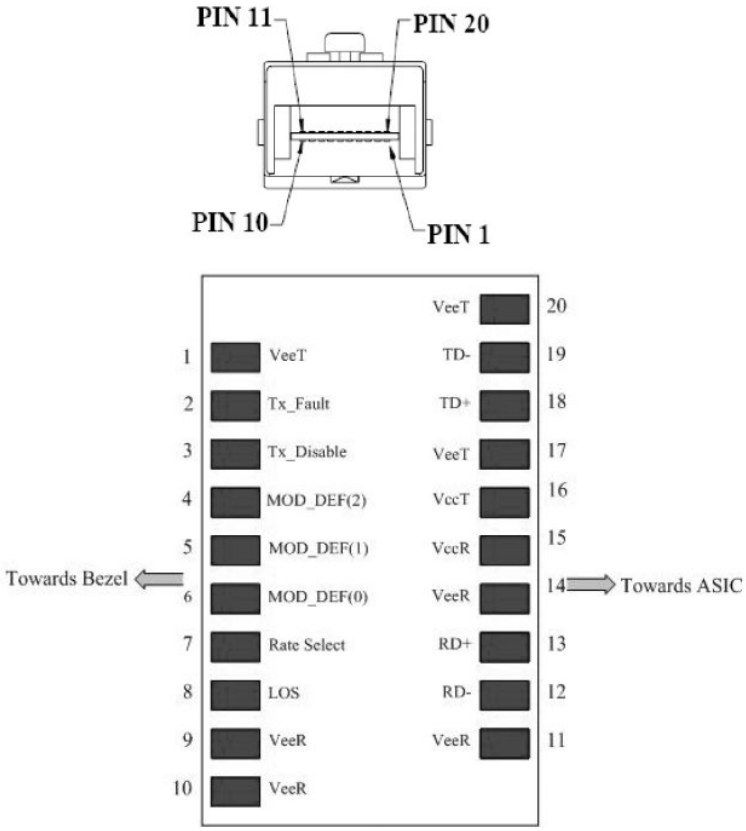
   Low (0V – 0.8V): Transmitter On
   (>0.8V, <2.0V): Undefined
   High (2.0V – 3.465V): Transmitter Disabled
   Open: Transmitter Disabled.
3. MOD-DEF0, 1, & 2. These are the module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

   MOD-DEF0 is grounded by the module to indicate that the module is present.
   MOD-DEF1 is the clock line of the 2-wire serial interface for serial ID.
   MOD-DEF2 is the data line of the 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

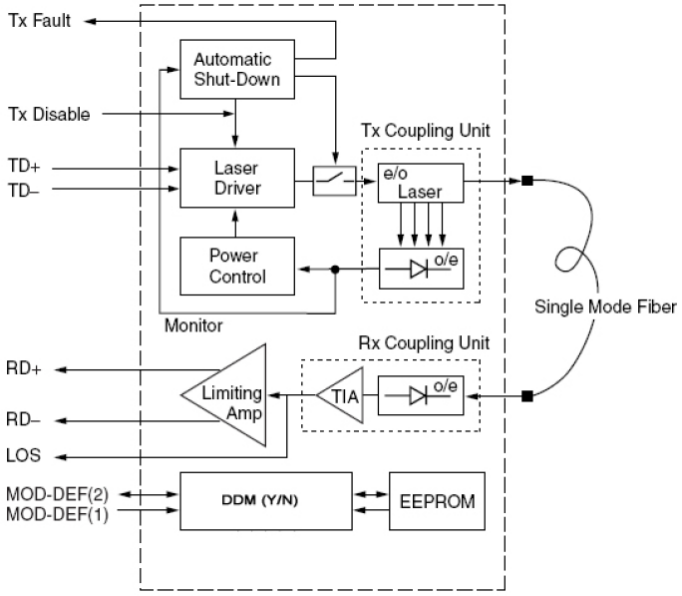
resistor. Pull-up voltage between 2.0V and VccT/R+0.3V. When “high,” this output indicates that the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). “Low” indicates normal operation. In the “low” state, the output will be pulled to <0.8V.

5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100Ω differential lines that should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
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. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot-plugging of the SFP transceiver module will result in an in-rush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module.

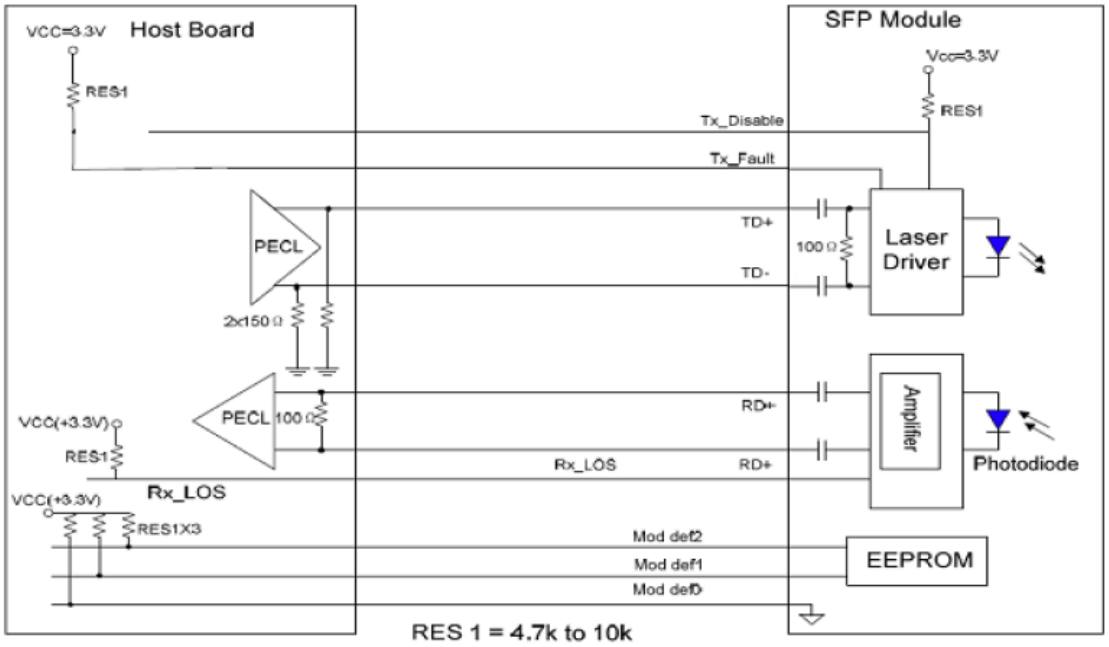
Electrical Pad Layout



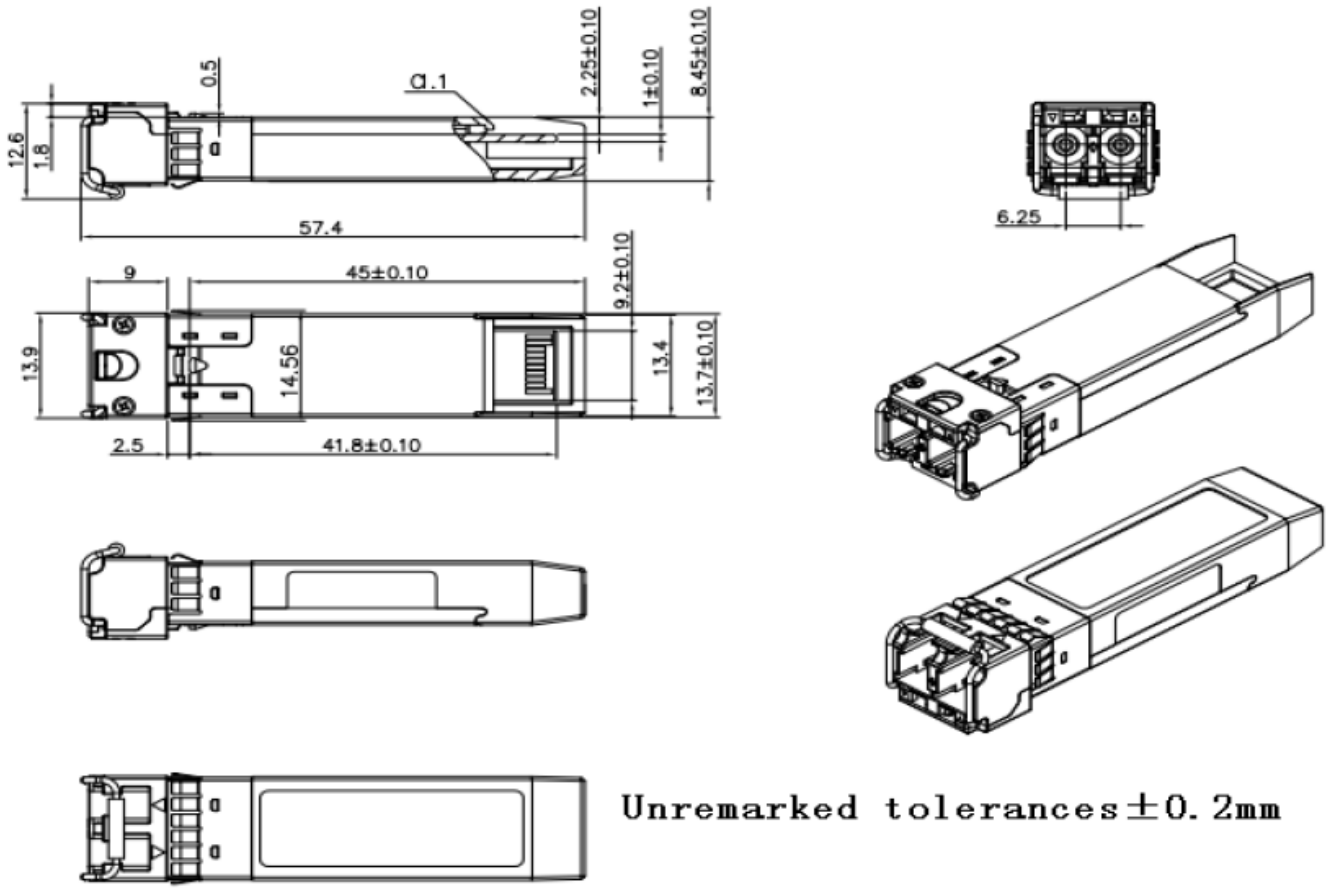
Functional Description



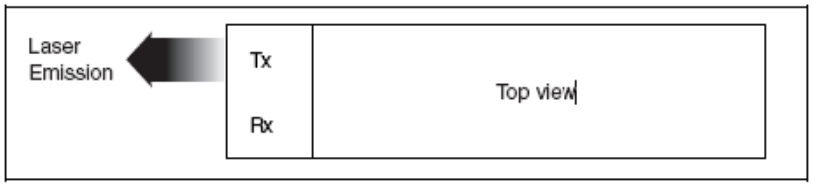
Recommended Circuit Schematic



Mechanical Specifications



Laser Emission



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.

Contact Information

ProLabs US

Email: sales@prolabs.com
Telephone: 952-852-0252

ProLabs UK

Email: salessupport@prolabs.com
Telephone: +44 1285 719 600