

## SFP-1GB-CW-39-160-C

MSA and TAA 1000Base-CWDM SFP Transceiver (SMF, 1390nm, 160km, LC, DOM)

### Features:

- INF-8074 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



### Applications:

- Gigabit Ethernet over CWDM
- 1x Fibre Channel
- Access, Metro and Enterprise

### Product Description

This MSA compliant SFP transceiver provides 1000Base-CWDM throughput up to 160km over single-mode fiber (SMF) using a wavelength of 1390nm via an LC connector. It can operate at temperatures between 0 and 70C. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.")



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Data Rate</b>	DR	0.622		1.25	Gbps	
<b>Bit Error Rate</b>	BER			$10^{-12}$		
<b>Operating Case Temperature</b>	Tc	0		70	C	1, 4
<b>Storage Temperature</b>	Tstg	-40		85	C	2
<b>Supply Current</b>	Icc		200	300	mA	3
<b>Maximum Voltage</b>	VMAX	-0.5		4	V	3

### Notes:

1. Case temperature.
2. Ambient temperature.
3. For the electrical power interface.
4. Commercial temperature.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Input Voltage</b>	Vcc	3.14	3.3	3.46	V	
<b>Supply Current</b>	Icc		200	300	mA	3
<b>Transmitter</b>						
<b>Input Differential Impedance</b>	RIN		100		$\Omega$	
<b>Single-Ended Data Input Swing</b>	VIN,pp	250		1200	mV	
<b>Transmit Disable Voltage</b>	VD	Vcc-1.3		Vcc	V	
<b>Transmit Enable Voltage</b>	VEN	Vee		Vee+0.8	V	
<b>Transmit Disable Assert Time</b>				10	us	
<b>Receiver</b>						
<b>Single-Ended Data Output Swing</b>	VOUT,pp	300	400	800	mV	
<b>Data Output Rise/Fall Time</b>	Tr/Tf		100	175	ps	
<b>LOS Asserted</b>	VLOSA	Vcc-0.5		Host_Vcc	V	
<b>LOS De-Asserted</b>	VLOSD	Vee		Vee+0.5	V	

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
<b>Output Optical Power</b>	PTX	3		7	dBm	1
<b>Optical Center Wavelength</b>	$\lambda_C$	1385	1391	1397	nm	
<b>Extinction Ratio</b>	ER	9			dB	
<b>Side-Mode Suppression Ratio</b>	SMSR	30			dB	
<b>Spectral Width (-20dB)</b>	$\Delta\lambda$			1	nm	
<b>Optical Rise/Fall Time (20-80%)</b>	Tr/Tf			180	ps	
<b>Relative Intensity Noise</b>	RIN			-120	dB/Hz	
<b>Transmitter Jitter (Pk-Pk)</b>	TJ			100	ps	
<b>Output Eye</b>	Compliant with IEEE 802.3					
<b>Receiver</b>						
<b>Optical Input Wavelength</b>	$\lambda_C$	1270		1620	nm	
<b>Receiver Sensitivity</b>	Rx_SEN			-34	dBm	2
<b>Receiver Overload</b>	POL	-7			dBm	
<b>LOS Assert</b>	LOSA	-42			dBm	
<b>LOS De-Assert</b>	LOSD			-34	dBm	
<b>LOS Hysteresis</b>	LOSH	0.5			dB	

### Notes:

1. Average launch power.
2. Measured with a 2<sup>7</sup>-1 test pattern over 120km @1.25Gbps with BER<10<sup>-12</sup>.

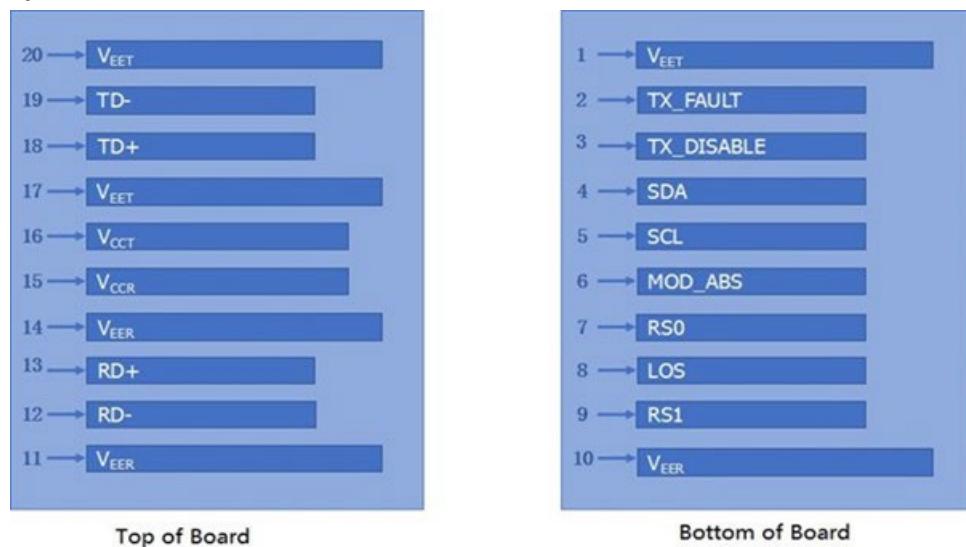
## Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault.	
3	Tx_Disable	Transmitter Disable. Laser output disabled on "high" or "open."	2
4	SDA	2-Wire Serial Interface Data.	3
5	SCL	2-Wire Serial Interface Clock.	3
6	MOD_ABS	Module Absent. Grounded within the module.	3
7	RS0	No Connection Required.	
8	LOS	Loss of Signal Indication. "Logic 0" indicates normal operation.	4
9	RS1	No Connection Required.	1
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.	
13	RD+	Receiver Non-Inverted Data Out. AC Coupled.	
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.	
19	TD-	Transmitter Inverted Data In. AC Coupled.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

### Notes:

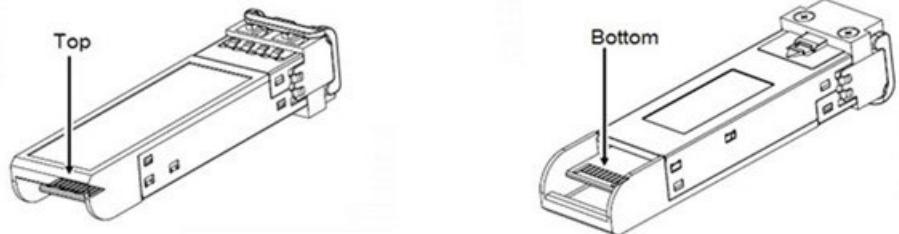
1. The circuit ground is isolated from the chassis ground.
2. Disabled: TDIS>2V or open, enabled: TDIS<0.8V.
3. Should be pulled up with  $4.7\text{k}\Omega$  to  $10\text{k}\Omega$  on the host board to a voltage between 2V and 3.6V.
4. LOS is open collector output.

## Electrical Pad Layout

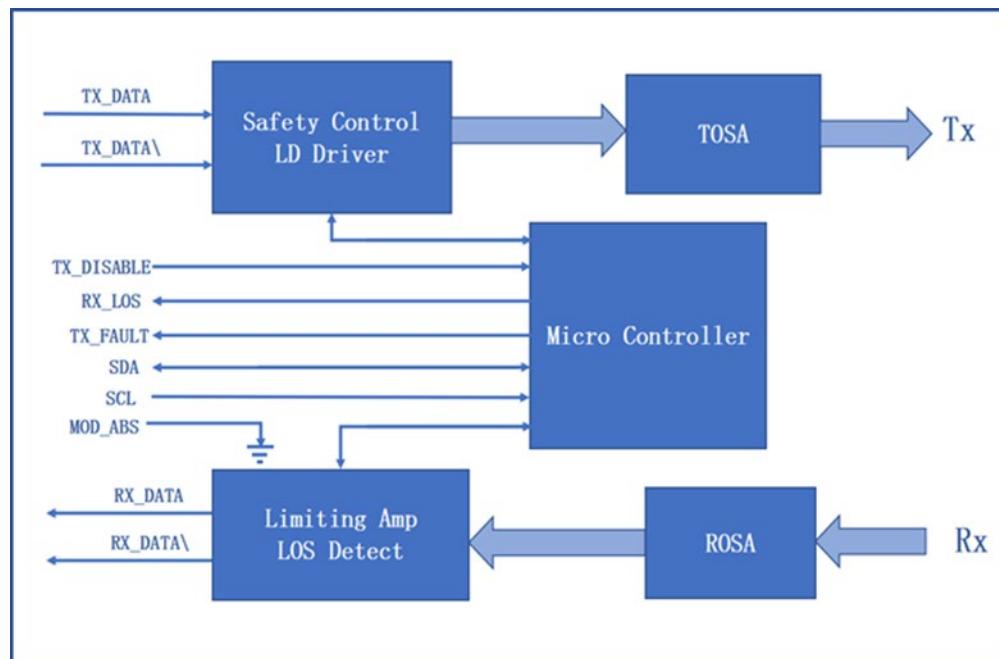


Top of Board

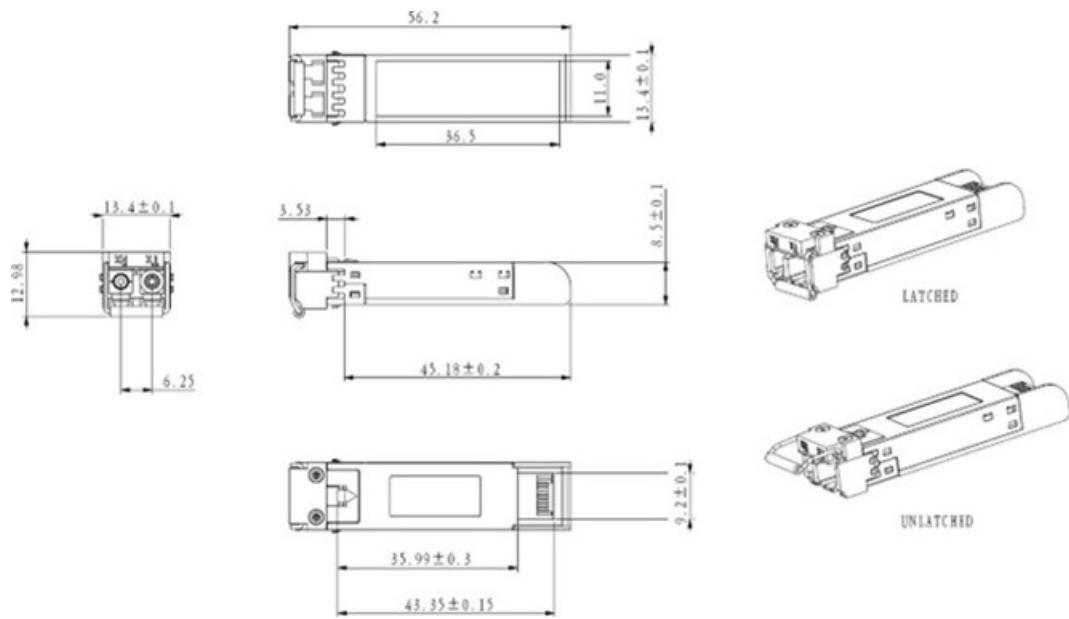
Bottom of Board



## Block Diagram of Transceiver



## Mechanical Specifications



All dimensions are  $\pm 0.2$ mm unless otherwise specified.

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.



## Contact Information

### ProLabs US

Email: [sales@prolabs.com](mailto:sales@prolabs.com)

Telephone: 952-852-0252

### ProLabs UK

Email: [salessupport@prolabs.com](mailto:salessupport@prolabs.com)

Telephone: +44 1285 719 600