

### SFP-10GERLC-PRO

Moxa® SFP-10GERLC Compatible TAA Compliant 8GBase-LW Fibre Channel SFP+ Transceiver (SMF, 1310nm, 40km, 0 to 70C, LC)

#### Features

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



#### Applications:

- Fibre Channel
- Access and Enterprise

#### Product Description

This Moxa® SFP-10GERLC compatible SFP+ transceiver provides 8GBase-LW Fibre Channel throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Moxa® 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. It is built to meet or exceed the specifications of Moxa®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Proline's 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		4.0	V
Storage Temperature	TS	-40		85	°C
Operating Case Temperature	Ti	0	25	70	°C
Data Rate			10.3125		Gbps

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V		
Power Supply Current	Icc			300	mA		
Power Dissipation	PD			1000	mW		
<b>Transmitter</b>							
Input Differential Impedance	Zin		100		Ω		
Differential Data Input Swing	Vin,p-p	180		700	mVp-p		
TX_FAULT	Transmitter Fault	VOH	2.0		Vcchost	V	
	Normal Operation	VOL	0		0.8	V	
TX_DISABLE	Transmitter Disable	VIH	2.0		Vcchost	V	
	Transmitter Enable	VIL	0		0.8	V	
<b>Receiver</b>							
Output Differential Impedance	Zo		100		Ω		
Differential Data Output Swing	VOUT, P-P	300		850	mVp-p	1	
Data Output Rise Time, Fall Time	tr, tf	28			ps	2	
RX_LOS	Loss of signal (LOS)	VOH	2.0		Vcchost	V	3
	Normal Operation	VOL	0		0.8	V	3

### Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.
2. 20-80%.
3. LOS is an open collector output. Should be pulled up with 4.7kΩ on the host board.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Launch Optical Power	P <sub>o</sub>	0		+5	dBm	1
Center Wavelength Range	λ <sub>c</sub>	1260	1310	1355	nm	
Extinction Ratio	ER	3.5			dB	2
Optical Modulation Amplitude	OMA	-5.2			dBm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Optical Return Loss Tolerance	ORLT			12	dB	
Pout @TX_Disable Asserted	P <sub>off</sub>			-30	dBm	1
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ER compatible					
<b>Receiver</b>						
Center Wavelength	λ <sub>c</sub>	1260	1310	1355	nm	
Receiver Sensitivity (P <sub>avg</sub> )	S			-15	dBm	3
Receiver Overload (P <sub>avg</sub> )	POL	0.5			dBm	3
Stressed Sensitivity (OMA)				-10.3	dBm	4
Optical Return Loss	ORL	12			dB	
LOS De-Assert	LOS <sub>D</sub>			-16	dBm	
LOS Assert	LOS <sub>A</sub>	-30			dBm	
LOS Hysteresis		0.5		4.5	dB	

### Notes:

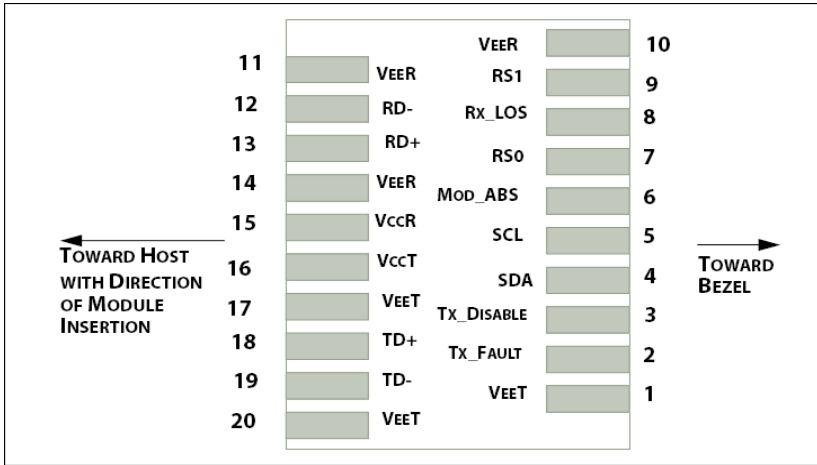
1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 10.3125 Gb/s, BER<10<sup>-12</sup>.
4. Comply with IEEE 802.3-2005.

## Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0 – Not used, Presents high input impedance	
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	
13	RD+	Received Data out (CML-O)	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	
19	TD-	Inverse Transmitter Data In (CML-I)	
20	VeeT	Transmitter Ground	1

### Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.



**Recommended Host Board Power Supply Filter Network**

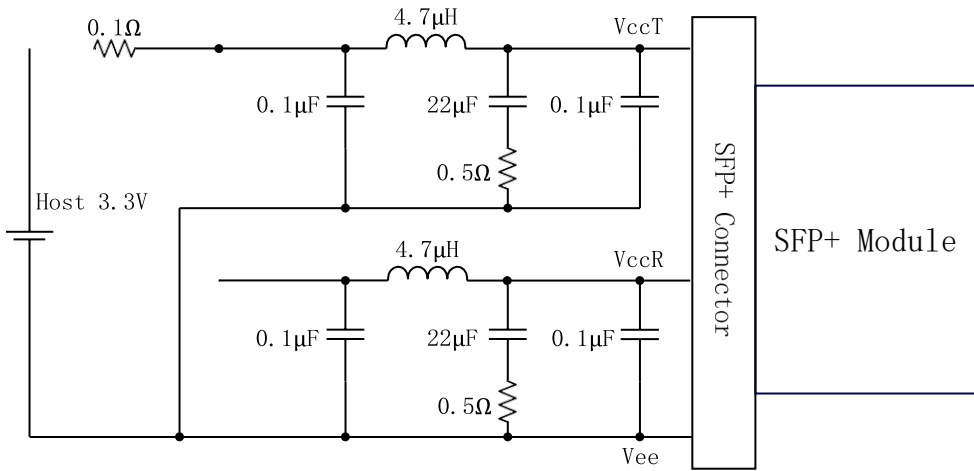
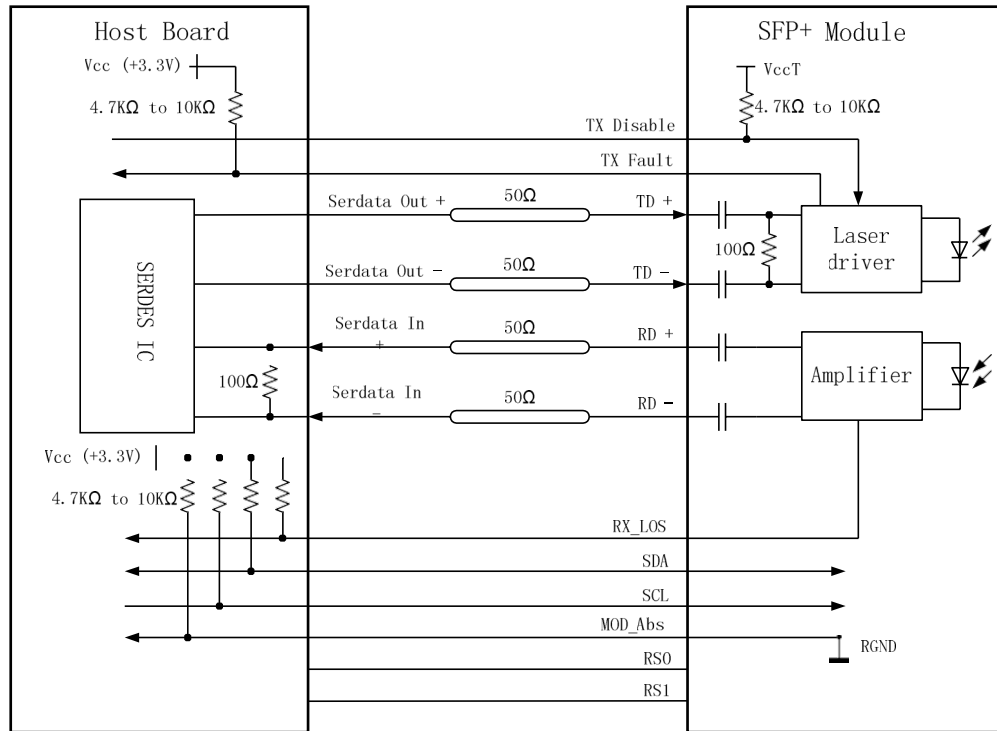


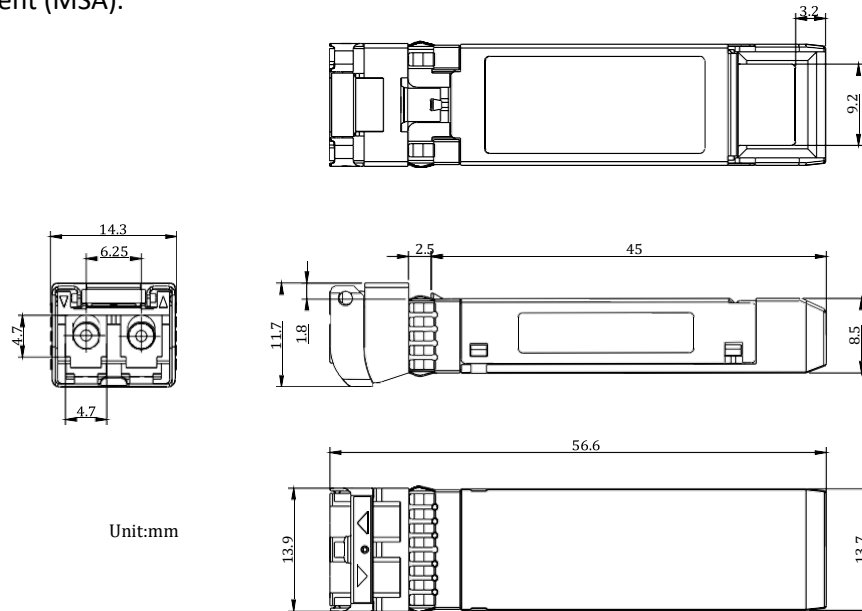
Figure 2. Recommended Host Board Power Supply Filter Network

## Recommended Application Interface Block Diagram



## Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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