

Optosa's SFP-1G-LX is a high performance, cost effective module which has a Duplex LC connector interface. Standard AC coupled CML for high speed signal and LVTTTL control and monitor signals. The receiver section uses a PIN receiver and the transmitter uses 1310nm FP laser, up to 15dB link budget ensure this module 1000Base Ethernet 10km application.

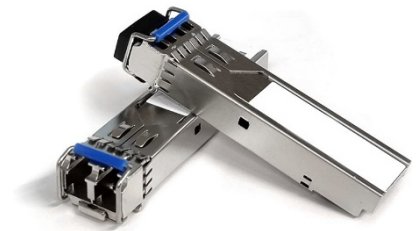
The SFP-LX can be used for Cisco GLC-LH-SMD, Aruba J4859D, Juniper EX-SFP-1GE-LX, Extreme 10052, 10052H and for many more OEMs like D-Link, H3C, Palo Alto, Meraki, Netgear, Arista, Brocade, Huawei, Dell, Alcatel, Nokia, HP...

RoHS Compliance

Optosa is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

Product Features

- Transmission data rate up to 1.25Gbit/s
- Up to 10km on 9/125µm SMF
- 1310nm FP laser transmitter
- 3.3V power supply voltage
- Hot Pluggable SFP form factor
- Duplex LC connector
- Compliant with SFF-8472
- Built-in digital diagnostic function
- RoHS compliant and Lead Free



Applications

- 1.25 Gb/s 1000Base-LX Ethernet

Ordering Information

Part Number	Description
SFP-1G-LX	SFP LX 1310nm 10km SMF optical transceiver, C-Temp.

Absolute Maximum Rating

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40	85	°C	
Operating Case Temperature	TOP	0	70	°C	
Power Supply Voltage	VCC	-0.3	3.6	V	
Relative Humidity (non-condensation)	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Power Consumption				1	W	
Data Rate	DR		1.25		Gbps	
Link Distance with MMF	D			10	km	

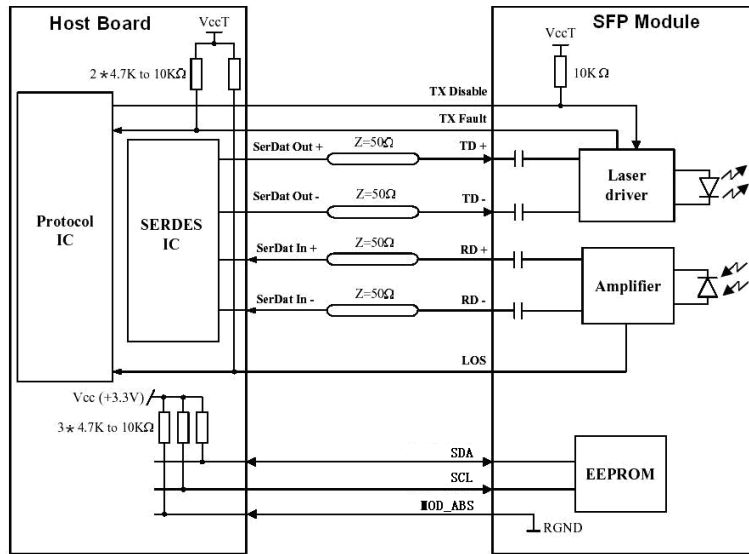
Electrical and Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ_C	1260	1310	1360	nm	
RMS Spectral Width	λ_{rms}			3.5	nm	
Average Launch Power	PAVG	-9		-3	dBm	
Rise/Fall Time	Tr/Tf			260	ps	
Extinction Ratio	ER	9			dB	
Transmitter Eye Mask		Compliant with IEEE 802.3 standard				
Receiver						
Center Wavelength	λ_C	1260		1580	nm	
Damage Threshold	THd	-1			dBm	
Receiver Sensitivity	SEN			-23	dBm	
Signal Loss Assert Threshold	LOSA	-45			dBm	
Signal Loss Deassert Threshold	LOSD			-24	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

- Also specified to meet curves in FC-PI 13.0 Figures 18 and 19, which allow trade-off between wavelength spectral width.
- Class 1 Laser Safety per FDA/CDRH and EN(IEC) 60825 regulations.
- Unfiltered, 20-80%. Complies with IEEE 802.3(Gig.E), FC 1x and 2x eye masks when filtered.
- Measured with conformance signals defined in FC-PI 13.0 specifications.
- Measured with PRBS7 at 10-12 BER.
- Dispersion limited per FC-PI Rev. 13.

Recommended Interface Circuit



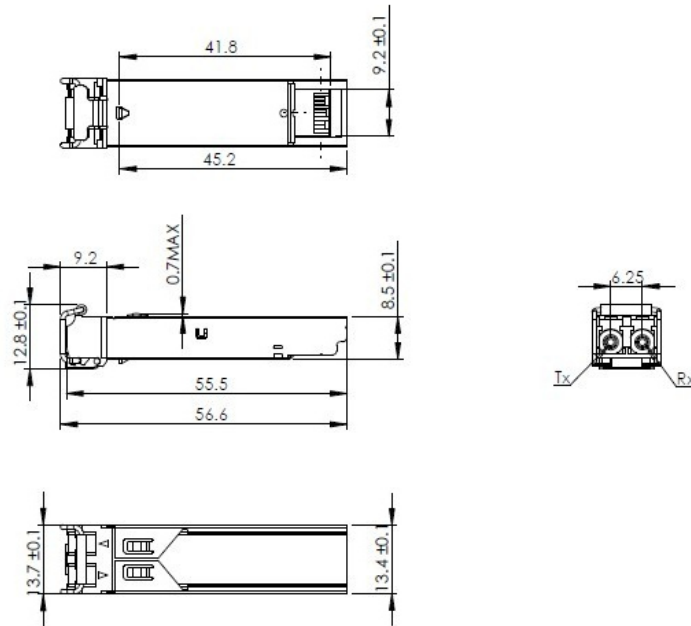
Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

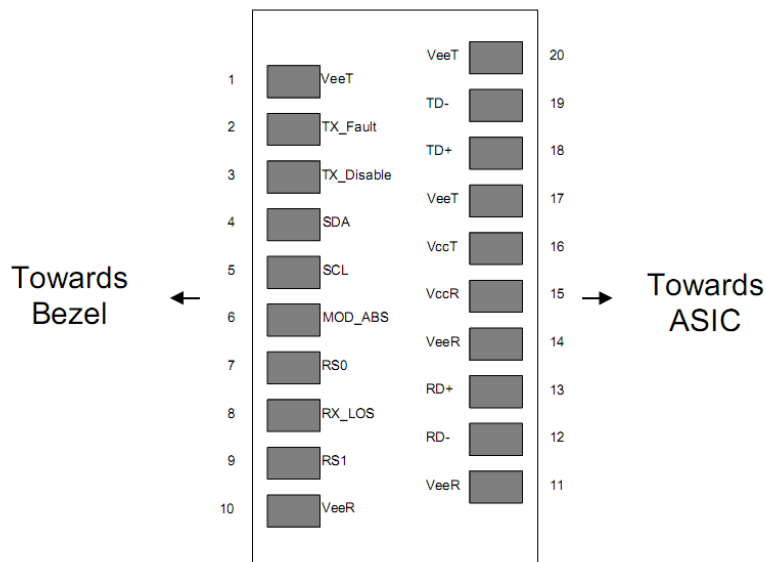
Parameter	Symbol	Min	Max	Unit
Temperature monitor absolute error	DMI_Temp	-5	5	°C
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V
Channel RX power monitor absolute error	DMI_RX_Ch	-3	3	dB
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA
Channel TX power monitor absolute error	DMI_TX_Ch	-3	3	dB

Mechanical Dimensions

Units: mm



Pin Assignment and Description



Pin Assignment

Pin	Signal Name	Description	Plug Seq.	Notes
1	VEET	Transmitter Ground	1	1
2	TX FAULT	Transmitter Fault Indication	3	
3	TX DISABLE	Transmitter Disable	3	2
4	SDA	SDA Serial Data Signal	3	3
5	SCL	SCL Serial Clock Signal	3	3
6	MOD_ABS	Module Absent. Grounded within the module	3	3
7	RS0	Not Connected	3	4
8	LOS	Loss of Signal	3	5
9	RS1	Not Connected	3	1
10	VEER	Receiver ground	1	1
11	VEER	Receiver ground	1	1
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	6
14	VEER	Receiver ground	1	1
15	VCCR	Receiver Power Supply	2	1
16	VCCT	Transmitter Power Supply	2	
17	VEET	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit Data In	3	6
20	VEET	Transmitter Ground	1	

Note:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. Rate select is not used.
5. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6. AC Coupled.

ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).