01-SSC-9790-LL

INTEL/BROADCOM COMPATIBLE 1000BASE-LX SFP 1310nm 10km DOM Transceiver

Application

- Gigabit Ethernet Switches and Routers
- Fiber Channel Switch Infrastructure
- Ethernet/SDH/OTN Sonet
- Other Optical Links

Features

- Operating Data Rate up to 1.25Gbps
- 10km with 9/125 umμm smf
- Single 3.3V Power Supply and TTL Logic
- Hot-Pluggable SFP Footprint Duplex LC Connector Interface
- Class 1 FDA and IEC60825-1 Laser Safety Compliant
- Built-in digital diagnostic functions, including optical power monitoring
- Industrial Temperature Range: -40~+85℃
- Compliant with MSA SFP Specification
- Compliant with SFF-8472

Description

The Longline SFP1G-LX-31 series single mode transceivers are small form factor pluggable module for bi directional serial optical data communications such as Gigabit Ethernet 1000BASE LX and Fiber Channel 1x SM-LC-L-FC-PI It is with the SFP 20-pin connector to allow hot plug capability This module is designed for single mode fiber and operates at a nominal wavelength of 1310nm

The transmitter section uses a multiple quantum well 1310nm laser and is a class 1 laser compliant according to International Safety Standard IEC The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post amplifier IC The SFP1G-LX-31 series are designed to be compliant with SFF-8472 SFP Multi source Agreement MSA

Product Specifications

I General Product Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Bit Rate	BR			1.25	Gb s
Max Supported Link Length	L_{MAX}			10	km

II Absolute Maximum Ratings

Exceeding any one of these values may destroy the device immediately

Parameter	Symbol	Min	Max	Units
Storage Temperature	Ts	-40	+85	℃
Supply Voltage	Vcc	-0.5	3.6	V
Operating Relative Humidity			95	%

III Optical and Electrical Characteristics

Parameter		Symbol	Min	Typ	Max	Unit
m Diameter SMF		L		10		Km
Power Supply Voltage		V_{CC}	3.15	3.3	3.45	V
Power Supply Current		I_{CC}			300	Ma
Date Rate	GBE			1.25		Gbps
	FC			1.063		
Transmitter						
Center Wavelength		λC	1260	1310	1360	nm
Spectral Width RMS		Δλ			4	nm
Average Output Power note		Pout	-9.5		-3	dBm
Extinction Ratio note		ER	9			Db
Rise Fall Time ～		tr tf			0.26	ps
Total Jitter note		TJ			0.43	UI
Output Optical Eye note		IEEE z and ANSI Fiber Channel Compliant note				
TX_Disable Assert Time		t_off			10	us
Pout@TX Disable Asserted		Pout			-45	dBm

Receiver

Center Wavelength	λC	1260		1600	nm
Receiver Sensitivity note	Pmin			-23	dBm
Receiver Overload	Pmax	-3			dBm
Return Loss		12			Db
LOS De Assert	LOS_D			-22	dB
LOS Assert	LOS_A	-35			dBm
LOS Hysteresis note		0.5			Db

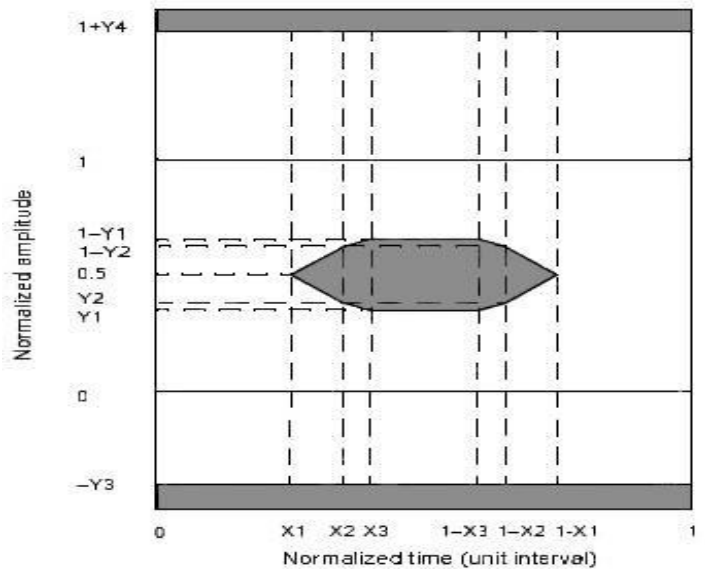
Notes

-Output is coupled into a 9/125 μm single mode fiber.

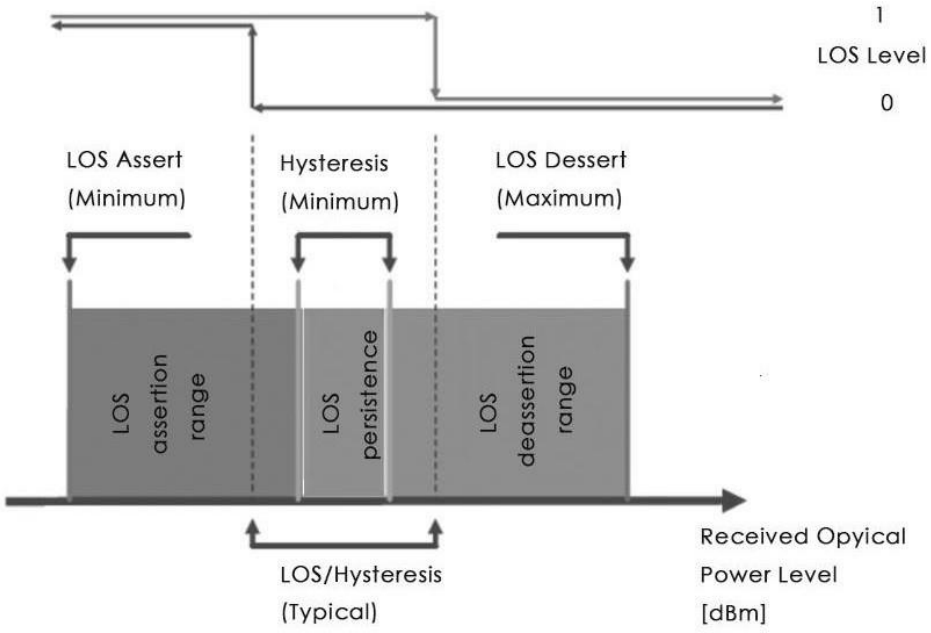
-Filtered measured with a PRBS 27-1 test pattern @1.25Gbps.

-Minimum avera ge optical power measured at BER less than 1E-12, with a 27-1 PRBS and ER:9 Db.

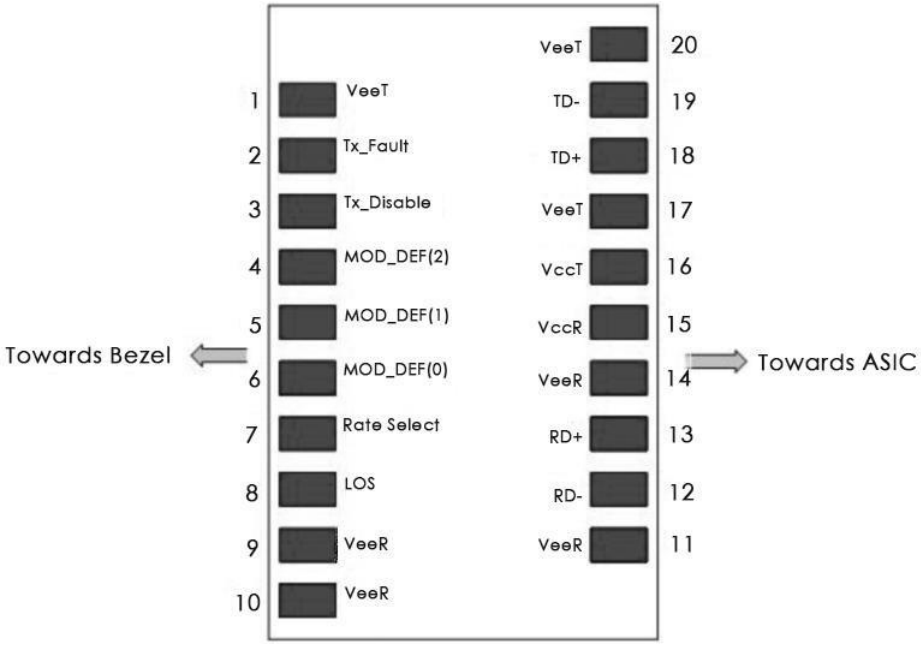
-Eye Pattern Mask.



LOS Hysteresis



IV Pin Description



Pin Num	Name	Function	Plug Seq	Notes
1	VeeT	Transmitter Ground	1	Note5
2	TX Fault	Transmitter Fault Indication	3	Note1
3	TX Disable	Transmitter Disable	3	Note2 Module disables on high or open
4	MOD DEF	SDA	3	Note3 wire serial ID interface
5	MOD DEF	SCL	3	Note3 wire serial ID interface
6	MOD DEF	MOD_ABS	3	Note3 Grounded within the module
7	Rate Select	Not Connect	3	Function not available
8	LOS	Loss of Signal	3	Note4
9	VeeR	Receiver Ground	1	Note5
10	VeeR	Receiver Ground	1	Note5
11	VeeR	Receiver Ground	1	Note5
12	RD	Inv Received Data Out	3	Note6
13	RD	Received Data Out	3	Note7
14	VeeR	Receiver Ground	2	Note5
15	VccR	Receiver Power	2	Note7 3.3V±5%
16	VccT	Transmitter Power	2	Note7 3.3V ±5%
17	VeeT	Transmitter Ground	2	Note5
18	TD	Transmit Data In	3	Note8
19	TD	Inv Transmit Data In	3	Note8
20	VeeT	Transmitter Ground	1	Note5

Notes

1. TX Fault is an open collector drain output which should be pulled up with a 4.7K-10KΩ resistor on the host board Pull up voltage between 2.0V and VccT, R+0.3.V. When high, output indicates a laser fault of some kinds. Low indicates normal operation In 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 4.7 – 10KΩ resistor Its states are Low (0-0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0 – 3.465V): Transmitter Disabled Open: Transmitter Disabled.

3. Mod Def 0,1,2. These are the module definition pins They should be pulled up with a 4.7 –10KΩ resistor on the host board The pull up voltage shall be VccT or VccR Mod Def 1 is grounded by the module to indicate that the module is present Mod Def is the clock line of two wire serial interface for serial ID Mod Def is the data line of two wire serial interface for serial ID.

4. LOS (Loss of Signal) is an open collector drain output which should be pulled up with a 4.7-10KΩ resistor. Pull up voltage between 2.0V and VccT/R+0.3V. When high ,this output indicates 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 which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required the host board. The voltage swing on these lines will be between 400 and 2000 mV differential (200–1000mV 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. Recommended host board power supply filtering is shown below Inductors with DC resistance of less than 1 ohm 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 inrush 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-/+: TD-/+: These are the differential transmitter inputs They are AC coupled differential lines with 100Ωdifferential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 400–2000mV (200–1000mV single ended).

V Mechanical Specifications

