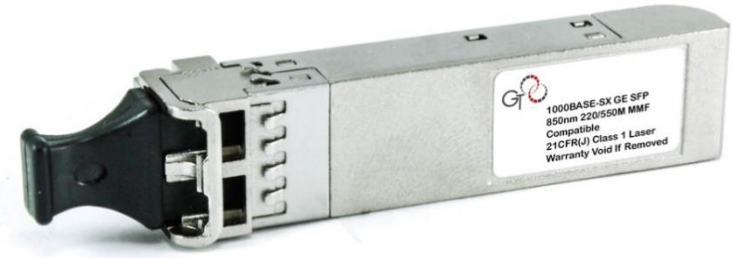
The GigaTech Products **ONS-SI-GE-SX-GT** is programmed to be fully compatible and functional with all intended CISCO switching devices. This SFP optical transceiver is based on the Gigabit Ethernet IEEE 802.3 standard and is designed to be compliant with SFF-8472 SFP Multi-source Agreement (MSA). This module is designed for multimode fiber and operates at a nominal wavelength of 850nm.

Features:

- Up to 1.25GBd bi-directional data links
- Hot-pluggable SFP footprint
- 850nm VCSEL laser transmitter
- Duplex LC Connectors
- Up to 300M over 62.5/125 MMF
- Up to 550M over 50/125 MMF
- Single power supply 3.3V
- Operating temperature range

  I-Temp: -40℃ to 85℃



Compliance:

- IEEE 802.3z Gigabit Ethernet
- SFP MSA SFF-8472
- RoHS
- Class 1 laser product EN 60825

Applications

- 1.25GBd Gigabit Ethernet

Warranty:

GigaTech Branded Optical Transceivers- Lifetime Warranty

General Specifications

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*	*Remarks*
Data Rate	*DR*		1.25		GBd	IEEE 802.3
Bit Error Rate	*BER*			10^{-12}		
Input Voltage	V_{CC}	3	3.3	3.6	V	
Maximum Voltage	V_{MAX}	-0.5		4	V	Electric Power Interface
Supply Current	I_S		180	240	mA	Electric Power Interface
Storage Temperature	T_{STO}	-40		85	℃	Ambient Temperature

Optical Characteristics - Transmitter

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*	*Remarks*
Optical Center Wavelength	λ	830		860	nm	
Output Optical Power	P_{TX}	-9		-3	dBm	Class 1 Product
Optical Modulation Amp	*OMA*	156			uW	
Extinction Ratio @ 1.25GBd	*ER*	9			dB	
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm	
Relative Intensity Noise	*RIN*			– 120	dB/Hz	
Optical Rise/Fall Time	T_{RF_IN}		100	150	ps	
Deterministic Jitter Contribute	$TX\_\Delta DJ$		20	60	ps	
Total Jitter Contribution	$TX\_\Delta TJ$		65	125	ps	

Optical Characteristics - Receiver

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*	*Remarks*
Optical Center Wavelength	λ_C	770		860	nm	
Optical Receive Power	P_{RX}			0	dBm	Average
Receiver Sensitivity @ 1.25GBd	P_{SENS1}			-20	dBm	IEEE 802.3
Optical Return Loss	*ORL*	12			dB	
Receive Electrical 3dB Cutoff				1500	MHz	
LOS Assert	LOS_A	-30			dBm	
LOS De-Assert	LOS_D			-20	dBm	
LOS Hysteresis		0.5			dB	

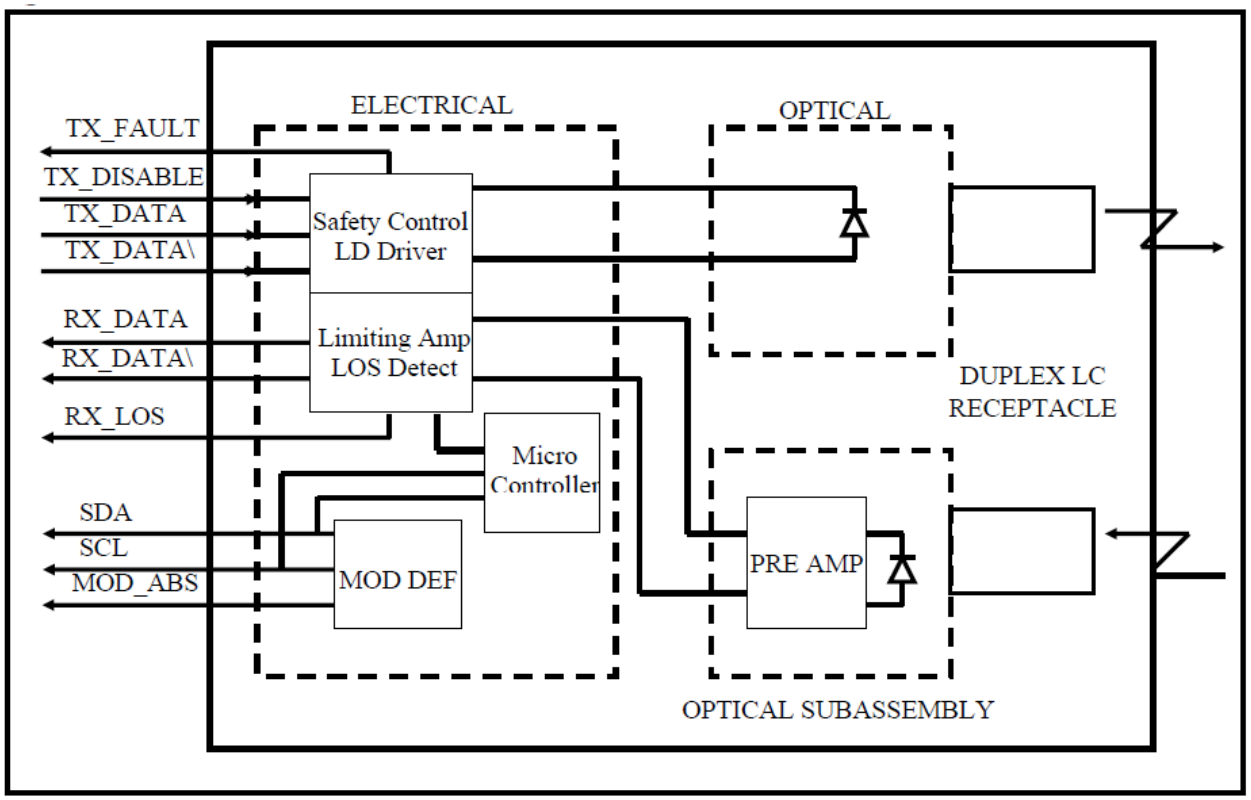
Electrical Characteristics – Transmitter

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*	*Remarks*
Input differential impedance	R_{in}		100		Ω	Non Condensing
Single ended data input swing	V_{IN_PP}	250		1200	mV	
Transmit Disable Voltage	V_D	2		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	V_{EE}		V_{EE} +0.8	V	

Electrical Characteristics – Receiver

Parameter	*Symbol*	*Min*	*Typ*	*Max*	*Unit*	*Remarks*
Single ended data output swing	V_{OUT_PP}	250	450	550	mV	
Data output rise time	T_R		90	175	ps	20%-80%
Data output fall time	T_F		90	175	ps	20%-80%
LOS Fault	V_{LOS_F}	2		V_{CC_HOST}	V	
LOS Normal	V_{LOS_N}	V_{EE}		V_{EE} +0.5	V	

Block Diagram of Transceiver



Transmitter Section

The Laser driver accept differential input data and provide bias and modulation currents for driving a laser. An automatic power-control (APC) feedback loop is incorporated to maintain a constant average optical power.1310 DFB in an eye safe optical subassembly (OSA) mates to the fiber cable.

TX_DISABLE- The TX_DISABLE signal is high (TTL logic “1”) to turn off the laser output. The laser will turn on within 1ms when TX_DISABLE is low (TTL logic “0”).

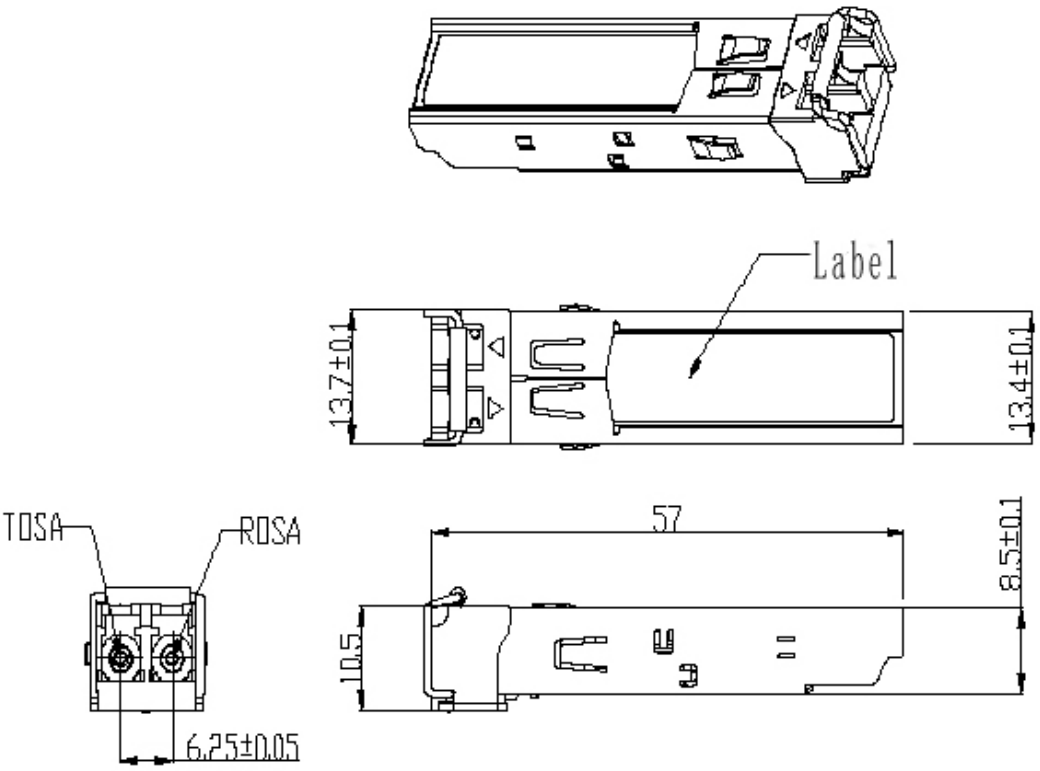
TX_FAULT- When the TX_FAULT signal is high, output indicates a laser fault of some kind. Low indicates normal operation.

Receiver Section- The receiver utilizes a PIN detector integrated with a trans-impedance preamplifier in an OSA. This OSA is connected to a Limiting Amplifier which providing post-amplification quantization, and optical signal detection. The limiting Amplifier is AC-coupled to the transimpedance amplifier, with internal 100Ω differential termination.

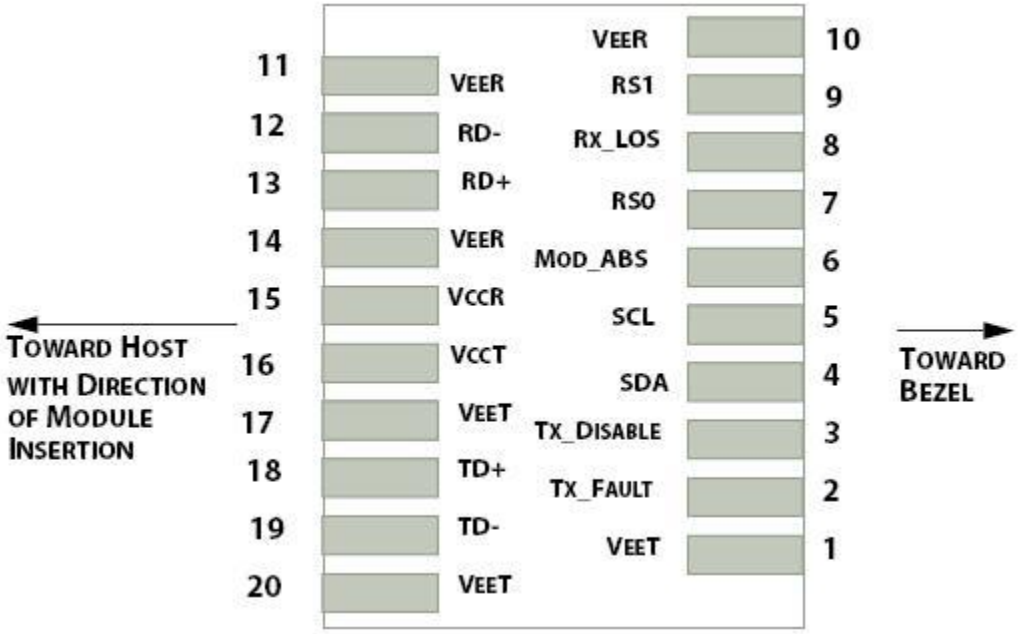
Receive Loss (RX_LOS)- The RX_LOS is high (logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

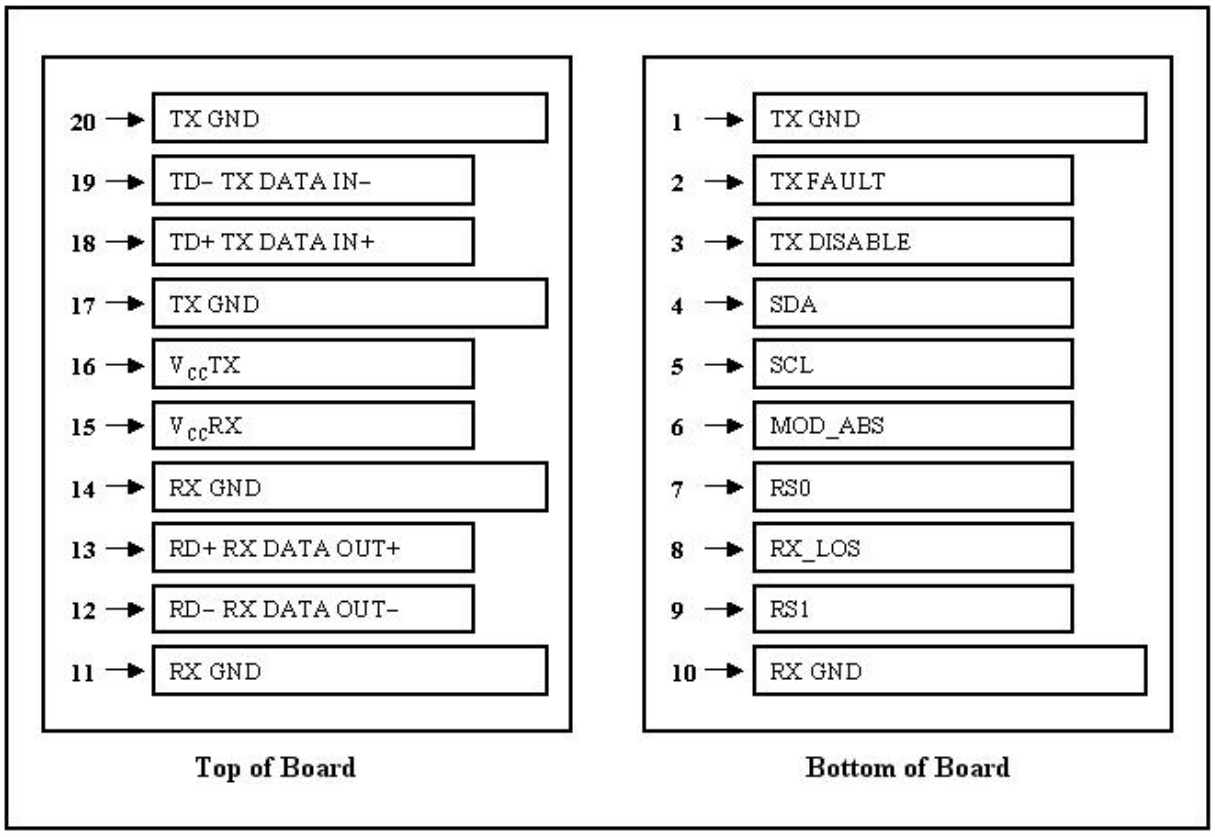
Controller Section- The micro controller unit monitors the operation information of LD driver and Limiting Amplifier and report these status to the customer.

Dimensions



Electrical Pad Layout





Pin Assignment

PIN #	*Symbol*	*Description*	*Remarks*
1	VEET	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground
2	TFAULT	Transmitter Fault	
3	TDIS	Transmitter Disable. Laser output disable on high or open	Disabled: TDIS>2V or open Enabled: TDIS<0.8V
4	SDA	Data line for serial ID	Should Be pulled up with 4.7k – 10k ohm on host board to a voltage between 2V and 3.6V
5	SCL	Clock line for serial ID	
6	MOD_ABS	Module Absent. Ground within the module	
7	RS0	No Connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	LOS is open collector output
9	RS1	+3.3V Power Supply	Circuit ground is isolated from chassis ground
10	VEER	Receiver ground (common with transmitter ground)	
11	VEER	Receiver ground (common with transmitter ground)	
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)	Circuit ground is isolated from chassis ground
15	VCCR	Receiver power supply	
16	VCCT	Transmitter power supply	Same as Pin# 1
17	VEET	Transmitter ground (common with receiver ground)	Circuit ground is connected to chassis ground
18	TD+	Transmitter Non-inverted DATA out. AC coupled	
19	TD-	Transmitter Inverted DATA out. AC coupled	
20	VEET	Transmitter ground (common with receiver ground)	Circuit ground is connected to chassis ground

References

1. IEEE standard 802.3. IEEE Standard Department, 2002.
2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.