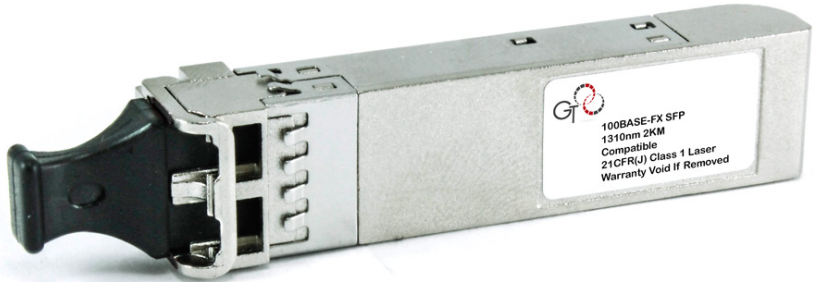


The GigaTech Products **GLC-GE-100FX-GT** is programmed to be fully compatible and functional with all intended CISCO switching devices. This SFP optical transceiver is based on the Fast Ethernet SGMII standard for Gigabit Ethernet ports and is designed to be compliant with SFF-8472 SFP Multi-source Agreement (MSA). This module is designed for multimode fiber and operates at a nominal wavelength of 1310nm.

Features:

- Up to 125MBd bi-directional data
- Hot-pluggable SFP footprint
- 1310nm LED transmitter
- Duplex LC Connectors
- Built in PHY supporting SGMII
- Up to 2km over MMF
- Single power supply 3.3V
- Operating temperature range
C-Temp: 0°C to 70°C



Compliance:

- 100BASE-FX
- SFP MSA SFF-8472
- RoHS
- Class 1 laser product EN 60825

Applications

- 125MBd Fast Ethernet

Warranty:

GigaTech Branded Optical Transceivers- Lifetime Warranty

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR		125		MBd	Fast Ethernet
Bit Error Rate	BER			10 ⁻¹²		
Input Voltage	V _{CC}	3.1	3.3	3.5	V	
Maximum Voltage	V _{MAX}	-0.5		4.6	V	Electric Power Interface
Supply Current	I _S		320	360	mA	Electric Power Interface
Storage Temperature	T _{STO}	-40		85	°C	Ambient Temperature

Optical Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ	1280		1380	nm	
Output Optical Power @ 62.5	P _{OUT_1}	-20		-14	dBm	
Output Optical Power @ 50	P _{OUT_2}	-2.35		-14	dBm	
Extinction Ratio	ER	10			dB	
Spectral Width (FWMH)	$\Delta\lambda$			175	nm	FDDI PMD3
Optical Rise/Fall Time	T _{RF_IN}		1000	3000	ps	20%-80%

Optical Characteristics - Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_C	1270		1600	nm	
Optical Receive Power	P _{RX}			-14	dBm	BER < 10 ⁻¹²
Receiver Sensitivity @ FE	R _{SENSI}			-31	dBm	PRBS 2 ⁻²³ -1
Optical Return Loss	ORL	12			dB	
Loss of Signal-Asserted	P _{LOS_A}	-45			dBm	
Loss of Signal-Deasserted	P _{LOS_D}			-33	dBm	
Loss of Signal-Hysteresis		1.5			dB	

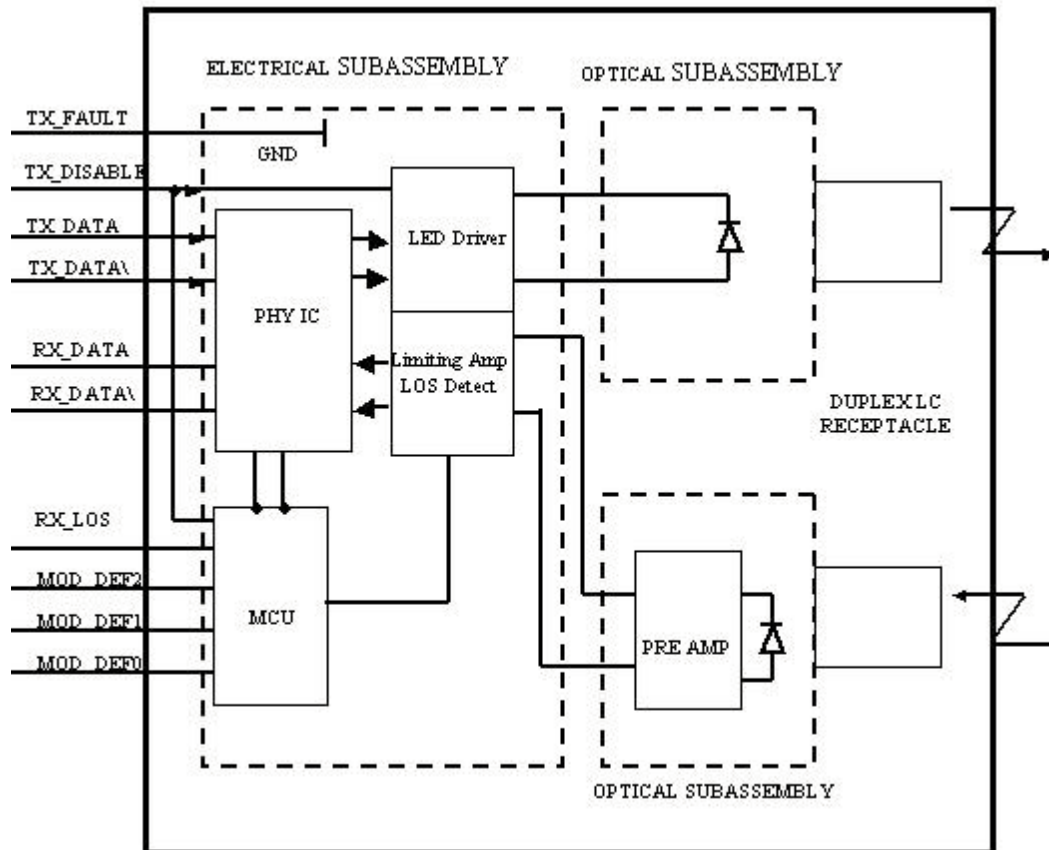
Electrical Characteristics – Transmitter

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	
Transmit Disable Assert Time				10	us	

Electrical Characteristics – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Single ended data output swing	V _{OUT_PP}	300		800	mV	
Data output rise time	T _{R/F}	0.6		5	ns	10%-90%
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 LED driver accepts differential input data and provide bias and modulation currents for driving LED. 1310nm LED 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").

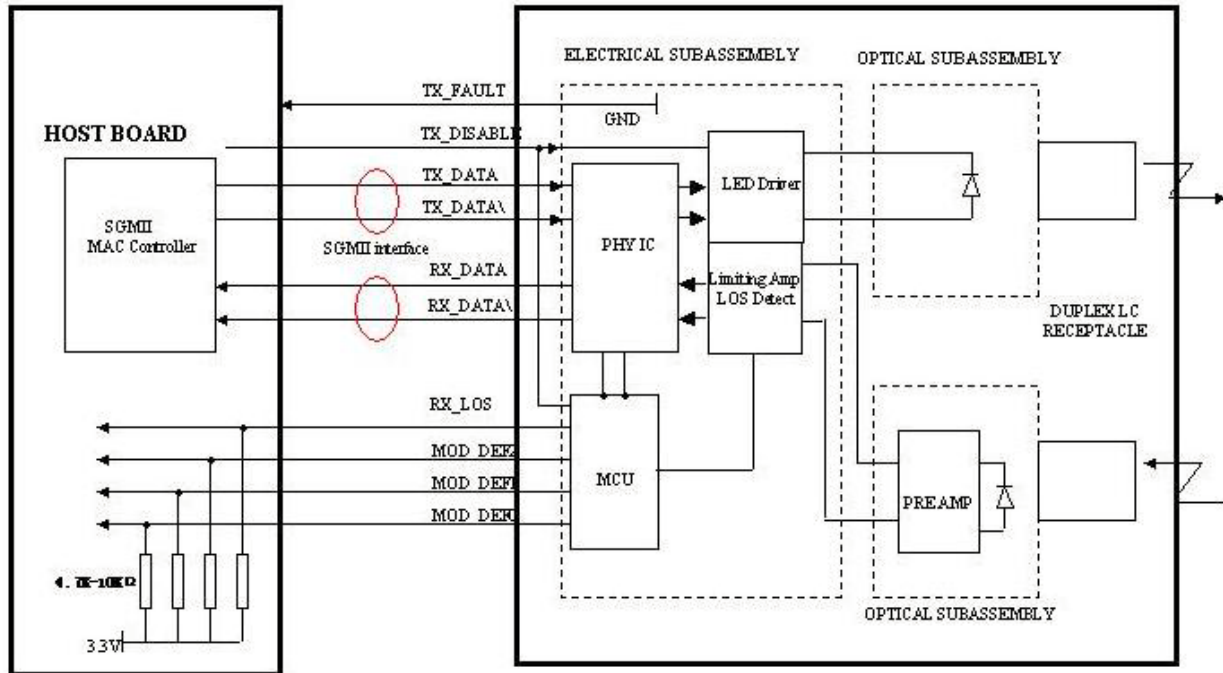
TX_FAULT- When the TX_FAULT signal is high, output indicates a laser fault of some kind. Low indicates normal operation.

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.

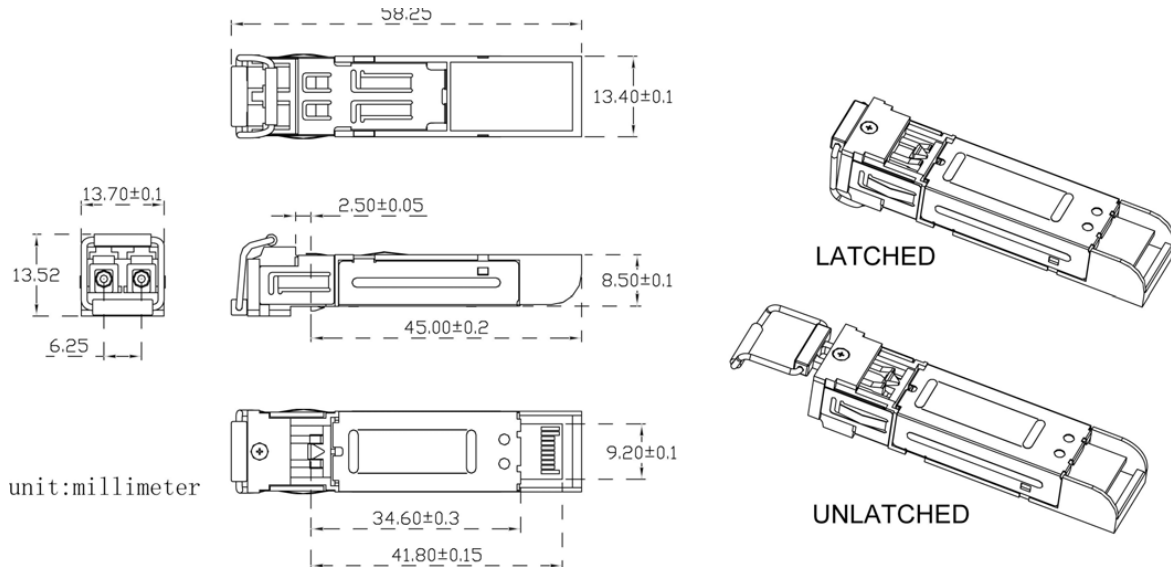
PHY Section- the PHY IC supports SGMII interface. The SGMII protocol of the module can be easily configured via a two-way serial interface by building in MCU. For running normally, the remote host interface must also support SGMII interface protocol and the host only needs to access the register A0H via I2C to get the parameter to configure the SGMII specification of the host side.

Recommended Interface Circuit

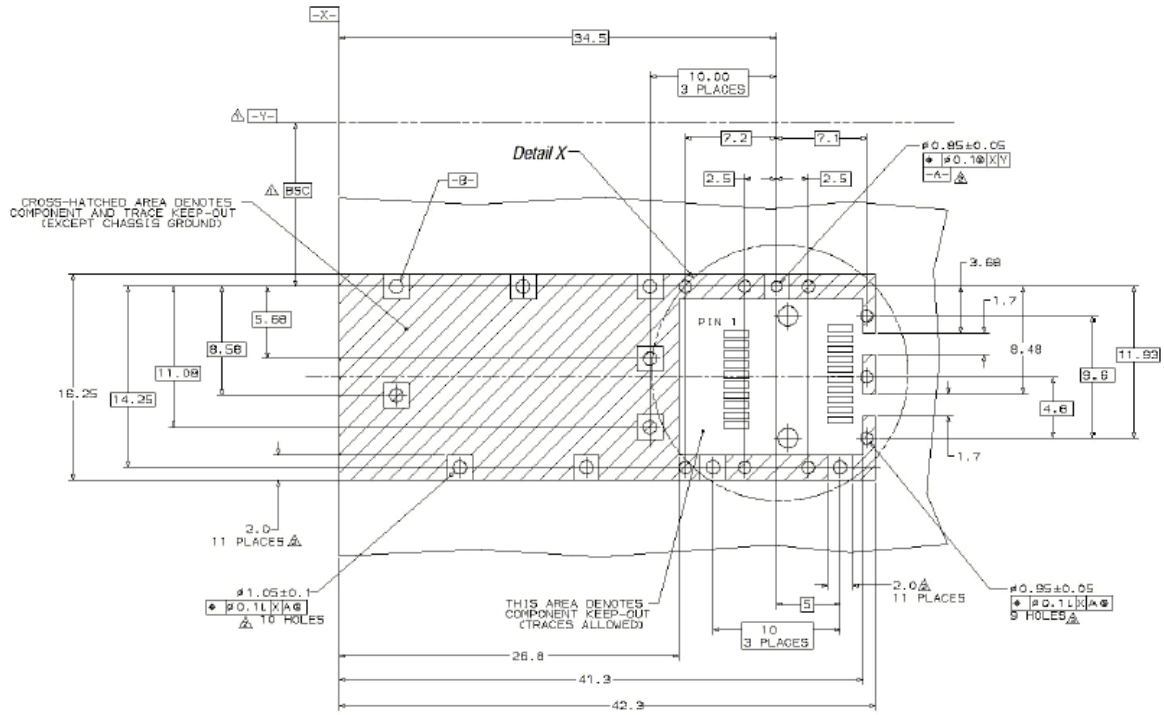


In 100Base-X mode, the MAC still transmits to the PHY at 1.25 Gbps but each byte is repeated 10 times. The PHY then converts this repeated data to 100Base-X format.

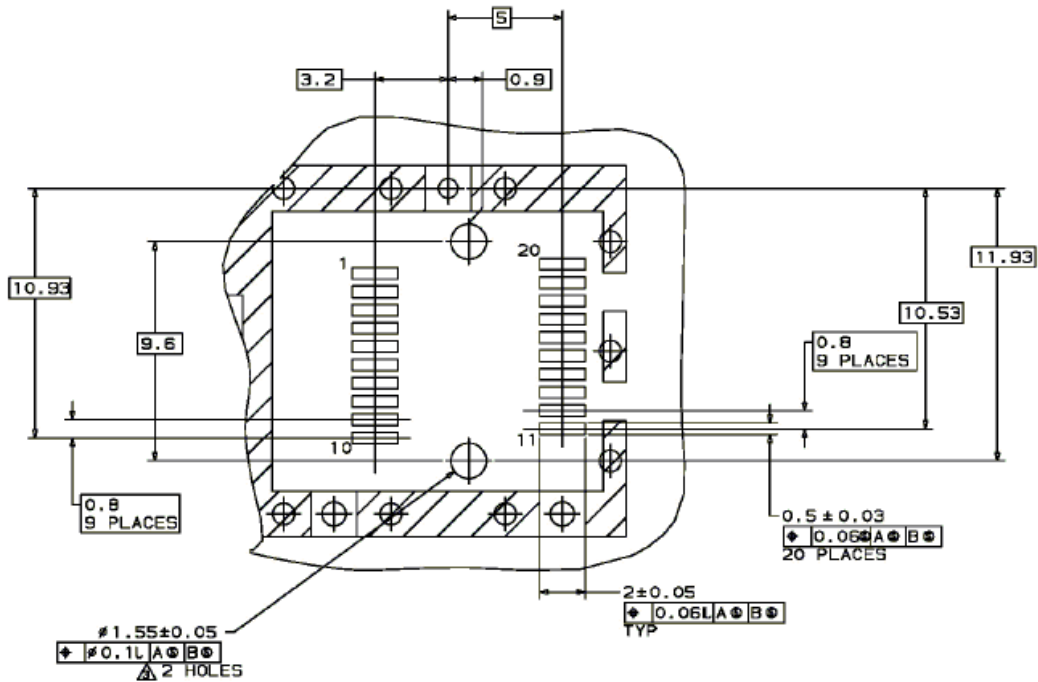
Dimensions



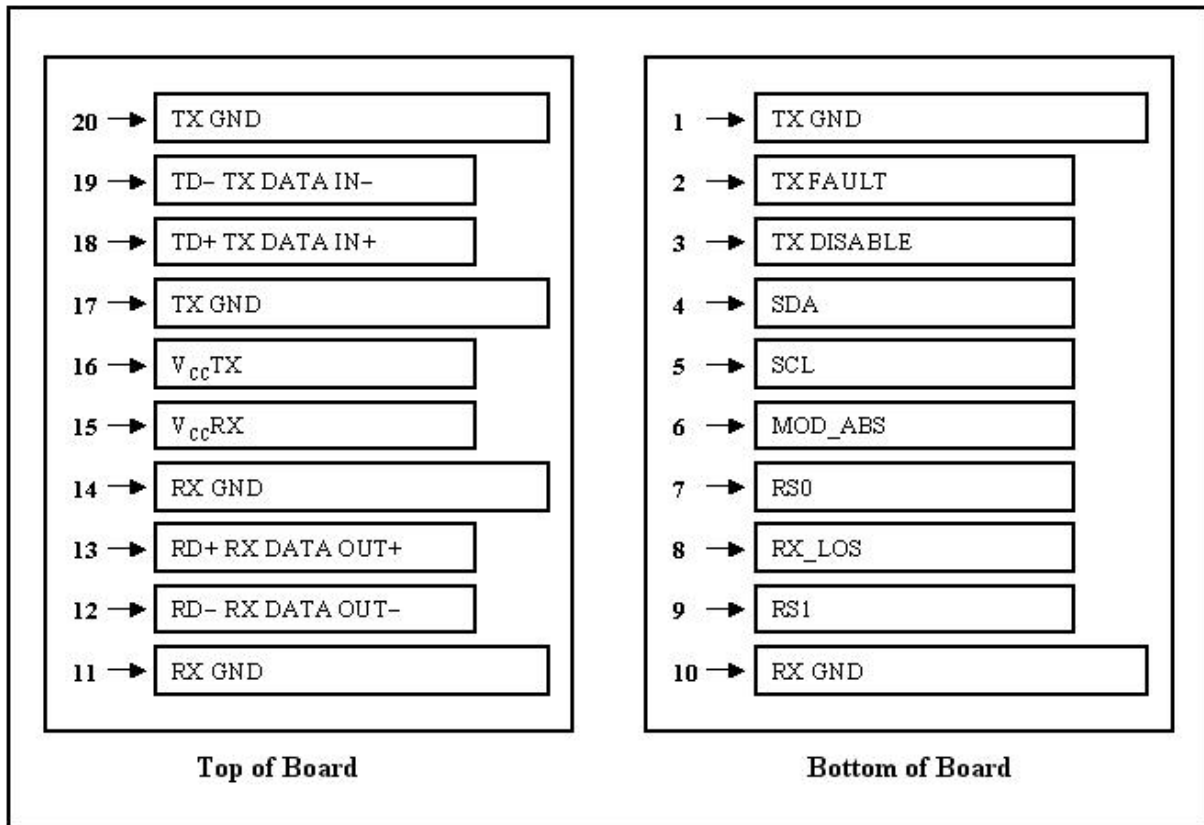
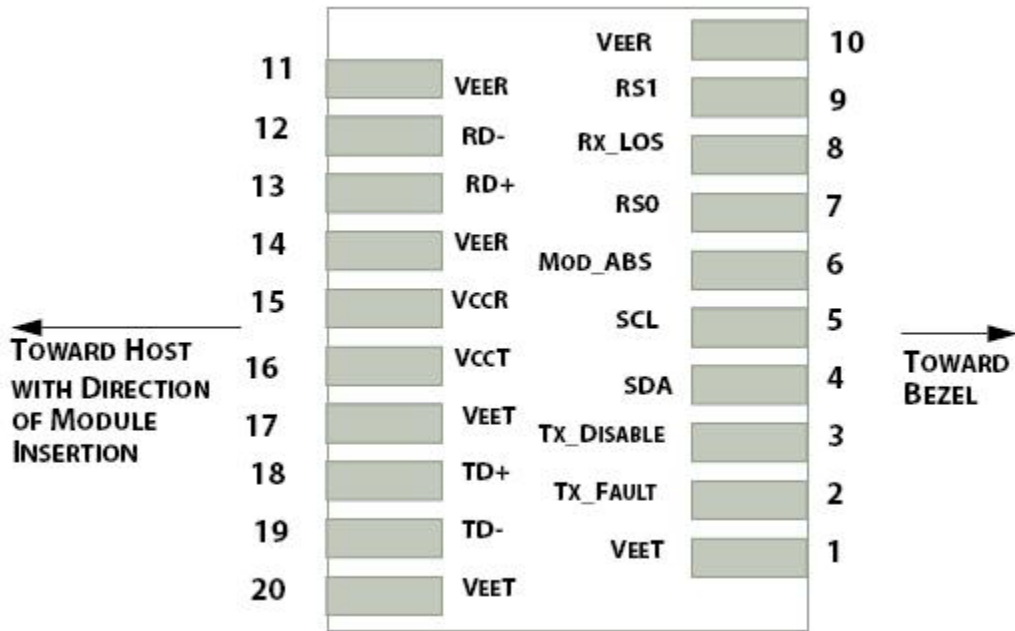
PCB Layout Recommendation



- Δ Datum and Basic Dimension Established by Customer
- Δ Pads and Vias are Chassis Ground, 11 Places
- Δ Through Holes are Unplated



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.
4. ISO/IEC 9314-3 "Information Processing Systems – Fiber Distributed Data Interface (FDDI), Part 3, Physical Layer Medium Dependent (PMD)," 1990.