

The GigaTech Products **407-BCBF-GT** is programmed to be fully compatible and functional with all intended DELL switching devices. This SFP module is based on the 25G Ethernet IEEE 802.3by standard and is designed to be compliant with the SFP Multi-source Agreement (MSA). This module is designed for multimode fiber and operates at a nominal wavelength of 850nm.

Features:

- Up to 25.78GBd bi-directional data links
- Hot-pluggable SFP28 footprint
- 850nm VCSEL laser transmitter
- Duplex LC connector
- Built-in digital diagnostic function
- Up to 100m over OM4 multi-mode fiber
- Maximum power consumption 1.2W
- Single power supply 3.3V
- Operating temperature range
 - C-Temp: 0°C to 70°C
 - E-Temp: -10°C to 85°C
 - I-Temp: -40°C to 85°C



Compliance:

- IEEE 802.3by
- MSA SFF-8401, SFF-8431, SFF-8432, SFF-8472
- RoHS Compliant

Applications:

- 25GBASE-SR/SW Ethernet

Warranty:

GigaTech Branded Optical Transceivers- Lifetime Warranty

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Storage Temperature	T_{STO}	-40		85	°C	Ambient Temperature
Power Supply Voltage	V_{CC}	-0.5		3.6	V	
Relative Humidity	RH	5		85	%	Non-Condensing

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Data Rate	DR		25.78		Gbps	
Data Speed Tolerance	ΔDR	-100		+100	ppm	
Tx DISABLE Input Voltage- High		2			V	
Tx DISABLE Input Voltage- Low				0.8	V	
Power Consumption				1.0	W	
Supply Current	I_{CC}			300	mA	

Link Distances

Parameter	Fiber Type	Distance Range (m)
25.78 GBd	OM2 50/125um MMF	20
	OM3 50/125um MMF	70
	OM4 50/125um MMF	100

Optical Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ	840		860	nm	
Spectral Width	$\Delta\lambda$	8.2		0.6	nm	
Average Output Power	P_{TX}	-8.4		2.4	dBm	
Extinction Ratio	ER	2			dB	

Optical Characteristics - Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_C	840		860	nm	
Average Receive Power	P_{RX}	-10.3		3	dBm	
Receiver Sensitivity in OMA	P_{SENS1}			-8.4	dBm	Worst ER: BER<10 ⁻¹² 2 ³¹ -1 PRBS
Optical Return Loss	ORL			-12	dB	
LOS Assert	LOS_A	-30			dBm	
LOS De-Assert	LOS_D			-13	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}	100		800	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

<i>Parameter</i>	<i>Symbol</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	<i>Remarks</i>
Single ended data output swing	V_{OUT_PP}	150	300	425	mV	
LOS Fault	V_{LOS_F}	2		V_{CC_HOST}	V	
LOS Normal	V_{LOS_N}	GND		GND+0.5	V	
Power Supply Rejection	PSR	100			mVpp	

Digital Diagnostic Functions

The SFP supports digital diagnostics monitoring function via a 2-wire serial communication protocol as defined in the SFF 8472. Digital diagnostic information are accessible over the 2-wire interface at the address 0xA2. Digital Diagnostics are internally calibrated by default. A micro controller unit inside the transceiver gathers the monitoring information and reports the status of transceiver.

Transceiver Temperature- Internally measured, represented as a 16 bit signed twos complement value in increments of 1/256 degrees Celsius, Temperature accuracy is better than ± 3 degrees Celsius over specified operating temperature and voltage.

Transceiver Supply Power- Internally measured, represented as a 16 bit unsigned integer with the voltage defined as the full 16 bit value (0 – 65535) with LSB equal to 100 μ Volt, yielding a total range of 0 to +6.55 Volts.

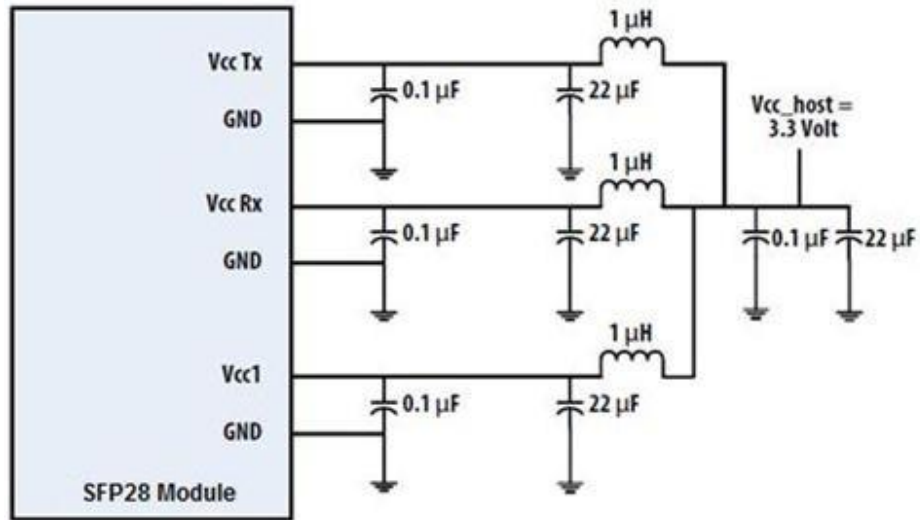
Transceiver TX bias current- Internally measured, represented as a 16 bit unsigned integer with the current defined as the full 16 bit value (0 – 65535) with LSB equal to 2 μ A, yielding a total range of 0 to 131mA. Accuracy is better than $\pm 10\%$ over specified operating temperature and voltage.

Transceiver TX output power- Internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit value (0 – 65535) with LSB equal to 0.1 μ W. Data is assumed to be based on measurement of laser monitor photodiode current. Accuracy is better than ± 3 dB over specified temperature and voltage. Data is not valid when the transmitter is disabled.

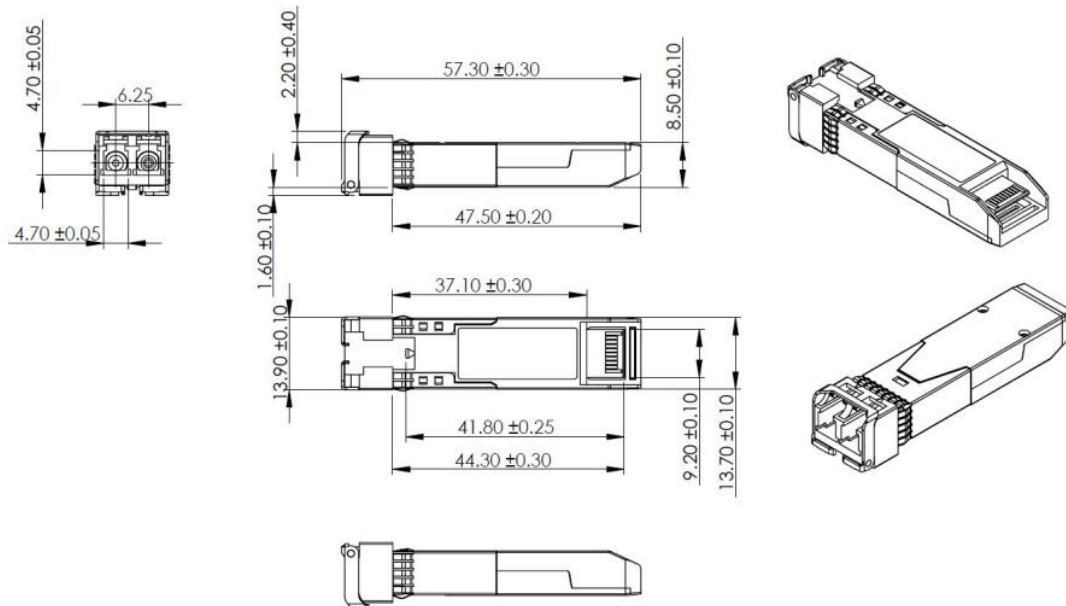
Transceiver RX received optical power- Internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit 35 value (0 – 65535) with LSB equal to 0.1 μ W. Accuracy is better than ± 3 dB over specified temperature and voltage.

<i>Parameter</i>	<i>Symbol</i>	<i>Min</i>	<i>Max</i>	<i>Unit</i>
Temperature	DMI_Temp	-3	3	$^{\circ}$ C
Voltage	DMI_VCC	-0.1	0.1	V
Tx Power	DMI_TX	-3	3	dBm
Rx Power	DMI_RX	-3	3	dBm
Bias Current	DMI_Ibias	-10%	10%	mA

Recommended Circuit

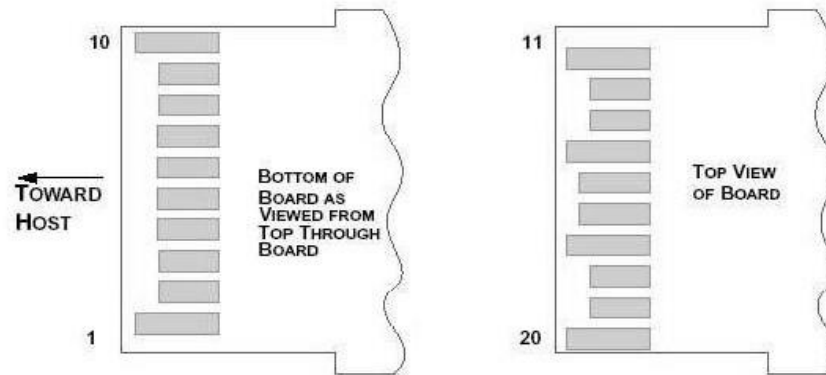


Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED UNIT: mm

Electrical Pad Layout



Pin Assignment

PIN #	Symbol	Description	Remarks
1	VEET	Transmitter ground (common with Rx 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 Tx ground)	
11	VEER	Receiver ground (common with Tx ground)	
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VEER	Receiver ground (common with Tx 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 Rx 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 Rx ground)	Circuit ground is connected to chassis ground

References

1. IEEE standard 802.3by. IEEE Standard Department
2. Digital Diagnostics Monitoring Interface for Optical Transceivers – SFF-8472.