

The GigaTech Products **Q28-503-GT** is programmed to be fully compatible and functional with all intended GIGAMON switching devices. This QSFP28 optical transceiver is compliant with SFF-8665 and QSFP28 MSA standards. This module converts 4 input channels of 25Gb/s electrical data into 4 LAN-WDM optical signals and multiplexes them into a single channel for 100Gb/s optical transmission. On the receiver side, this module optically de-multiplexes a 100Gb/s input into 4 LAN-WDM channel signals and converts them to 4 channel output electrical data. This module is designed for single mode fiber using LC connection and operates at central wavelengths of 1295.56, 1300.05, 1304.59, 1309.14nm up to 10km over single mode fiber.

Features:

- Up to 103.1 Gb/s per wavelength
- 4 LAN-WDM lane MUX/DEMUX
- Hot-pluggable QSFP28 footprint
- Duplex LC connector
- Built-in digital diagnostic function
- Up to 10KM over SMF
- Single power supply 3.3V
- Operating temperature range

C-Temp: 0°C to 70°C



Compliance:

- QSFP28 MSA
- MSA SFF-8436
- IEEE 802.3ba
- RoHS Compliant

Applications:

- 100GB Ethernet

Warranty:

GigaTech Branded Optical Transceivers- Lifetime Warranty

General Specifications - Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Storage Temperature	T_{STO}	-20		85	°C	Ambient Temperature
Bit Error Rate	BER			10^{-12}		
Input Voltage	V_{CC}	3.14	3.3	3.47	V	
Maximum Voltage	V_{MAX}	-0.5		3.6	V	Electrical Power Interface

Link Distances

Parameter	Fiber Type	Distance Range (Km)
100 GBd	9/125um SMF	10

Optical Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_c	1294.53	1295.56	1296.59	nm	L0 Lane
		1299.02	1300.06	1301.09	nm	L1 Lane
		1303.54	1304.59	1305.63	nm	L2 Lane
		1308.09	1309.14	1310.19	nm	L3 Lane
Total Output Optical Power	P_{OUT}			8.3	dBm	Average
Average Launch Power	P	-7		2.3	dBm	Each Lane
Optical Modulation Amp	OMA	-1.3		4.5	dB	Each Lane
Extinction Ratio	ER	4			dB	
Side Mode Suppression Ratio	$SMSR$	30			dB	
Relative Intensity Noise (OMA)	RIN			-130	dB/Hz	
Transmit Dispersion Penalty	TDP			1.8	dB	
Optical Return Loss Tolerance				20	dB	
Transmitter Eye Mask	Compliant to IEEE 802.3ba Standard					

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		1308.09	1309.14	1310.19	nm	L3 Lane
Optical Input Power (Each Lane)	P_{IN}	-10.6		4.5	dBm	Average
Receiver Sensitivity (Each Lane)	R_{X_SEN1}			-8.6	dBm	
LOS Assert	LOS_A	-24		-13.6	dBm	
LOS De-Assert	LOS_D			-11.6	dBm	
LOS Hysteresis			1.5		dB	

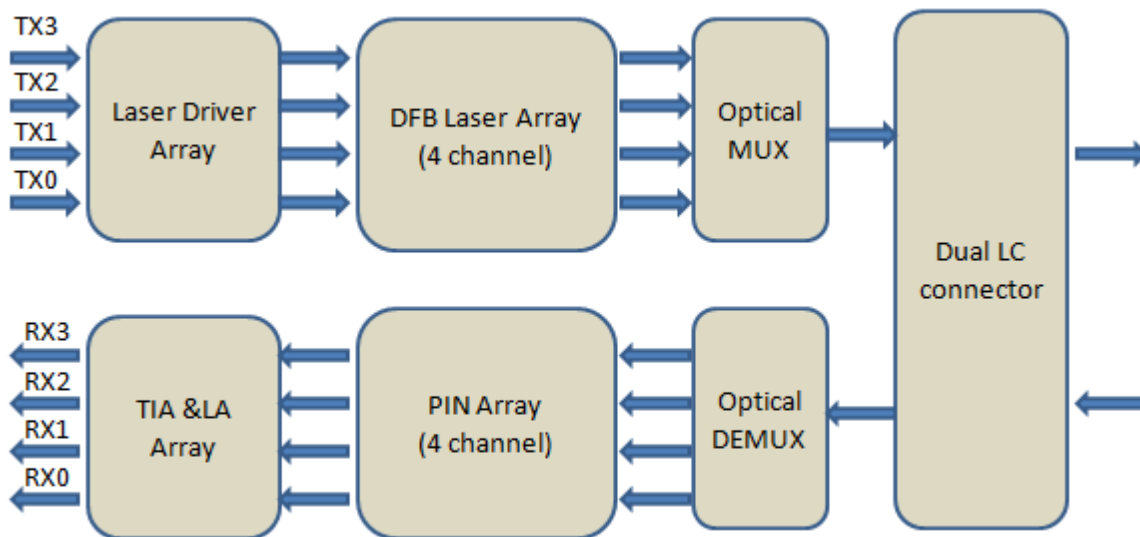
Electrical Characteristics – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input Differential Impedance	R_{IN}		100		Ω	Non Condensing
Single Ended Data Input Swing	V_{IN_PP}			900	mV	
Transmit Disable Voltage	V_D	$V_{CC}-1.3$		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}	150	300	425	mV	
Data Output Rise Time (20%-80%)	T_R		30		ps	
Data Output Fall Time (20%-80%)	T_F		30		ps	
LOS Fault	V_{LOS_F}	$V_{CC}-1.3$		V_{CC_HOST}	V	
LOS Normal	V_{LOS_N}	V_{EE}		$V_{EE}+0.5$	V	

Block Diagram of Transceiver

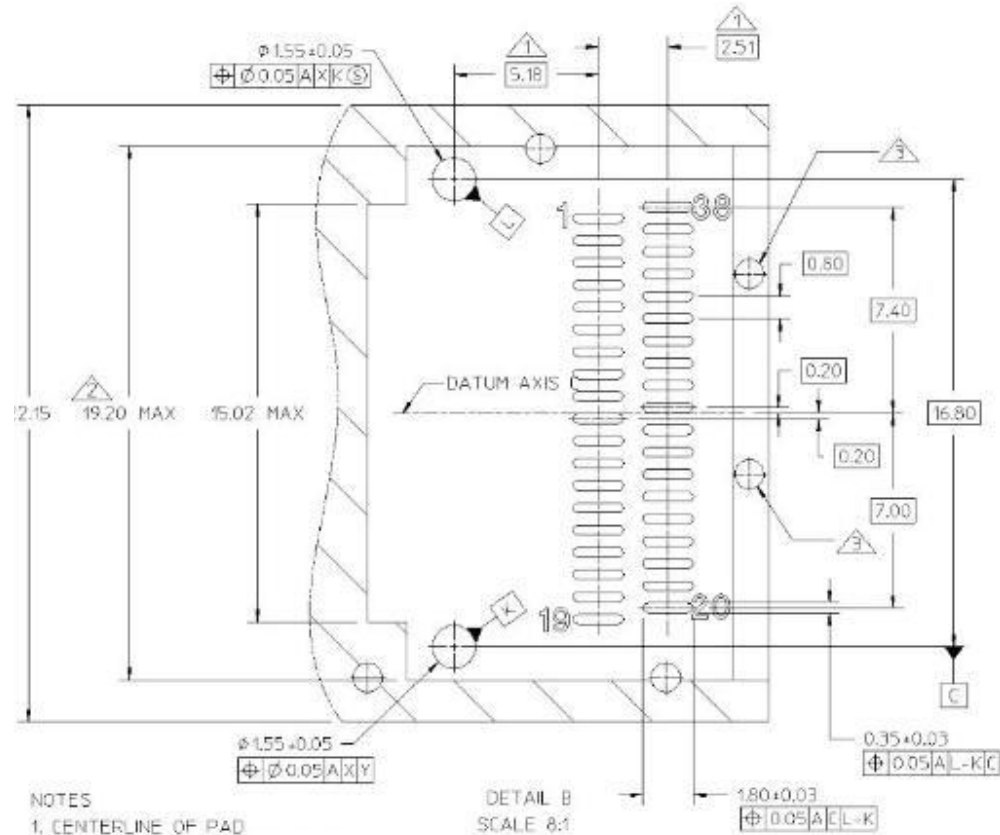
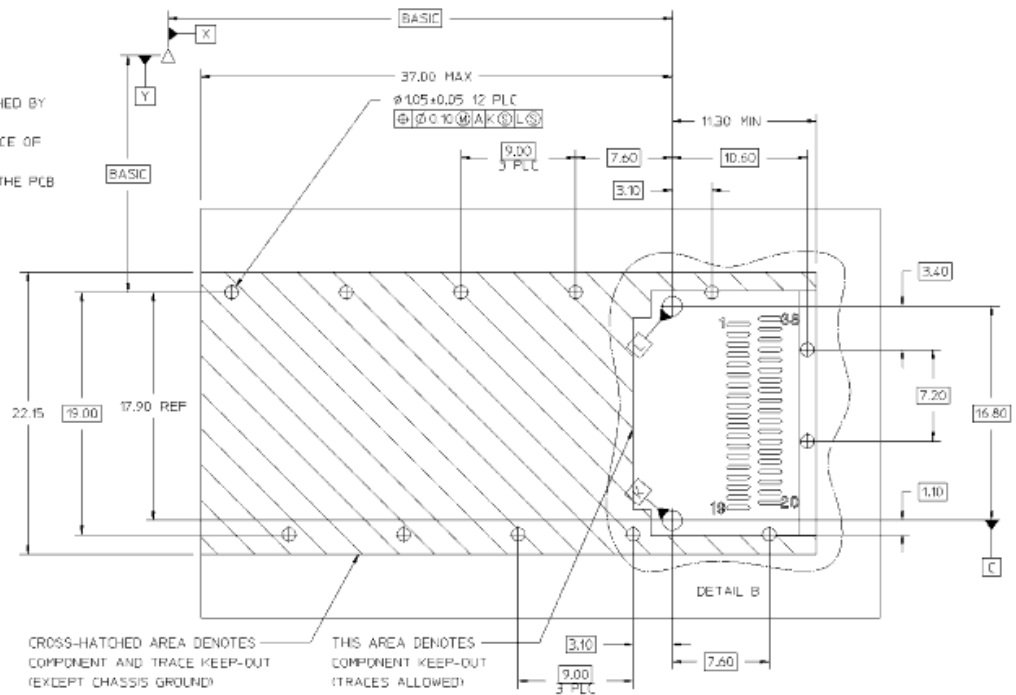


This product converts the 4-channel 25Gb/s electrical input data into LAN WDM optical signals (light), by a driven 4-wavelength Distributed Feedback Laser (DFB) array. The light is combined by the MUX parts as a 100Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 100Gb/s LAN WDM optical signals input, and de-multiplexes it into 4 individual 25Gb/s channels with different wavelength. Each wavelength light is collected by a discrete photo diode, and then outputted as electric data after amplified by a TIA.

PCB Layout Recommendation

NOTES

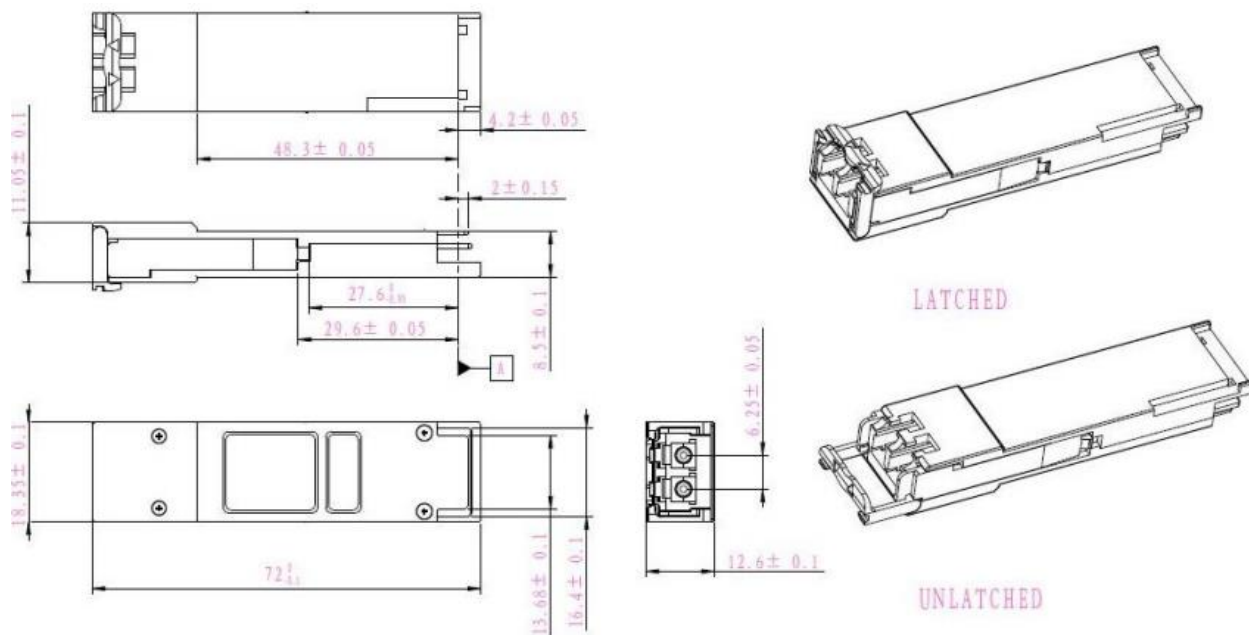
1. DATUM X & Y ARE ESTABLISHED BY THE CUSTOMER'S FIDUCIAL
2. DATUM A IS THE TOP SURFACE OF THE HOST BOARD
3. LOCATION OF THE EDGE OF THE PCB IS APPLICATION SPECIFIC
4. FINISHED PTH HOLE SIZE



NOTES

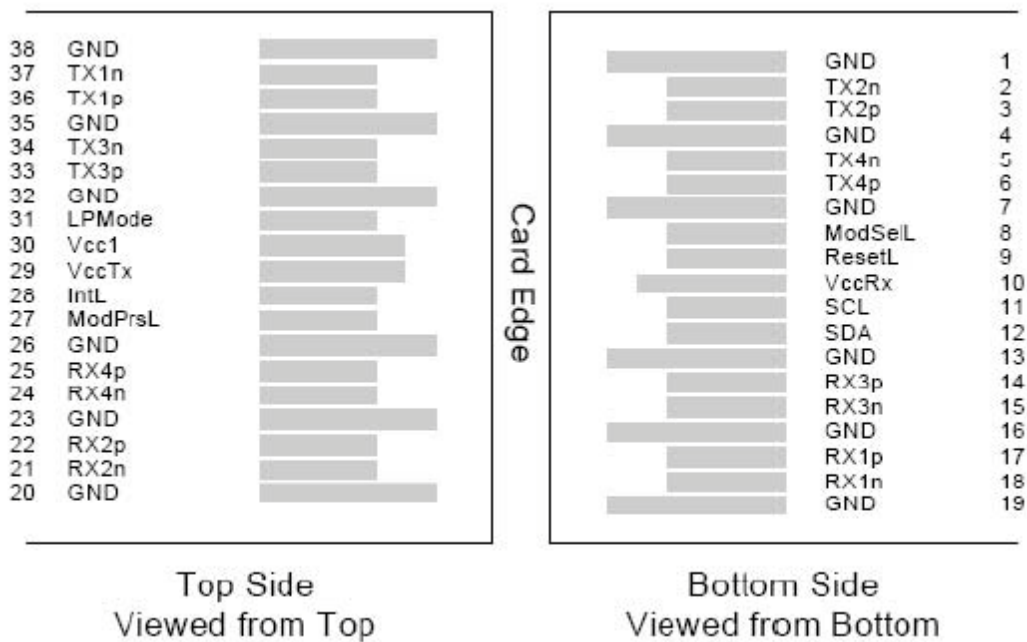
1. CENTERLINE OF PAD
2. SURFACE TRACES PERMITTED WITHIN THIS LENGTH
3. INDICATED HOLES ARE OPTIONAL

Dimensions



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

Electrical Pad Layout



Pin Assignment

PIN #	Symbol	Description	Remarks
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1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	Vcc RX	+3.3V Power Supply Receiver
11	SCL	2-wire serial interface clock
12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
21	Rx2n	Receiver Inverted Data Output
22	Rx2p	Receiver Non-Inverted Data Output
23	GND	Ground
24	Rx4n	Receiver Inverted Data Output
25	Rx4p	Receiver Non-Inverted Data Output
26	GND	Ground
27	ModPrsL	Module Present
28	IntL	Interrupt
29	Vcc TX	+3.3V Power Supply transmitter
30	Vcc1	+3.3V Power Supply
31	LPMode	Low Power Mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

References

1. IEEE standard 802.3ba. IEEE Standard Department.
2. QSFP28 10Gbs 4X PLUGGABLE TRANSCEIVER – SFF-8665