

The GigaTech Products **QSFP-100G-CWDM4-S-GT** is programmed to be fully compatible and functional with all intended CISCO 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 1271, 1291, 1311, 1331nm up to 2km 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 2KM over SMF
- Single power supply 3.3V
- Operating temperature range
C-Temp: 0°C to 70°C



Compliance:

- QSFP28 MSA
- CWDM4 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}	-40		85	°C	Ambient Temperature
Power Supply Voltage	V_{CC}	-0.3		3.6	V	
Relative Humidity	RH	0		85	%	
Input Voltage	V_{IN}	-0.3		$V_{CC}+3$	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Power Consumption				3.5	W	
Data Rate	DR		25.78		Gbps	
Data Speed Tolerance	ΔDR	-100		+100	ppm	
Link Distance	D	0		2	km	Singlemode G.652

Optical Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_c	1264.5	1271	1277.5	nm	L0 Lane
		1284.5	1291	1297.5	nm	L1 Lane
		1304.5	1311	1317.5	nm	L2 Lane
		1324.5	1331	1337.5	nm	L3 Lane
Average Launch Power	P	-6.5	-0.5	2.5	dBm	Each Lane
RMS Spectral Width	λ_{RMS}			3.5	nm	
Optical Modulation Amp	$POMA$	-4	-0.5	2.5	dB	Each Lane
Difference in Launch Power between any two lanes	$P_{TX-DIFF}$			4.0	dB	
Transmit Dispersion Penalty	TDP			3	dBm	Each Lane
Rise / Fall Time	T_R / T_F			30	ps	
Extinction Ratio	ER	3.5			dB	
Transmitter Reflectance	RT			-12	dB	
Transmitter Eye Mask Margin	EMM	10			%	
Launch Power OFF Transmitter	P_{OUT_OFF}			-30	dBm	
Transmitter Eye Mask	Compliant to IEEE 802.3ba Standard					

Optical Characteristics - Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_c	1264.5	1271	1277.5	nm	L0 Lane
		1284.5	1291	1297.5	nm	L1 Lane
		1304.5	1311	1317.5	nm	L2 Lane
		1324.5	1331	1337.5	nm	L3 Lane
Damage Threshold	TH_D	3			dBm	
Overload	OVL	2.5			dBm	Each Lane
Receiver Sensitivity in OMA	SEN			-10	dBm	Each Lane
LOS Assert	LOS_A	-30			dBm	
LOS De-Assert	LOS_D			-15	dBm	
LOS Hysteresis	LOS_H	0.5	1.5	6	dB	
Optical Return Loss	ORL			-12	dBm	

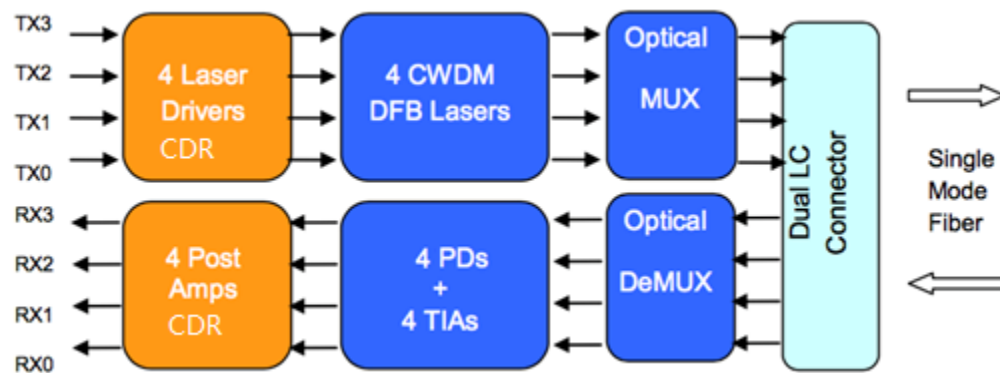
Electrical Characteristics – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential Input Impedance	Z_{IN}	90	100	110	ohm	
Differential Output Impedance	Z_{OUT}	90	100	110	Ohm	
Differential Input Amplitude	ΔV_{IN}	300		1100	mVp-p	
Differential Output Amplitude	ΔV_{OUT}	00		800	mV	
Input Logic Level High	V_{IH}	2.0		VCC	V	
Input Logic Level Low	V_{IL}	0		0.7	V	
Output Logic Level High	V_{OH}	VCC-0.5		VCC	V	
Output Logic Level Low	V_{OL}	0		0.4	V	

Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Remarks
Temperature Monitor Absolute Error	DMI_Temp	-3	+3	C	Over Temp Range
Supply Voltage Monitor Absolute Error	DMI_VCC	-0.1	+0.1	V	Over Full Range
Channel RX Power Monitor Absolute Error	DMI_RX_Ch	-3	3	dB	
Channel Bias Current Monitor	DMI_Ibias_Ch	-10%	+10%	mA	
Channel TX Power Monitor Absolute Error	DMI_TX_Ch	-3	3	dB	

Block Diagram of Transceiver

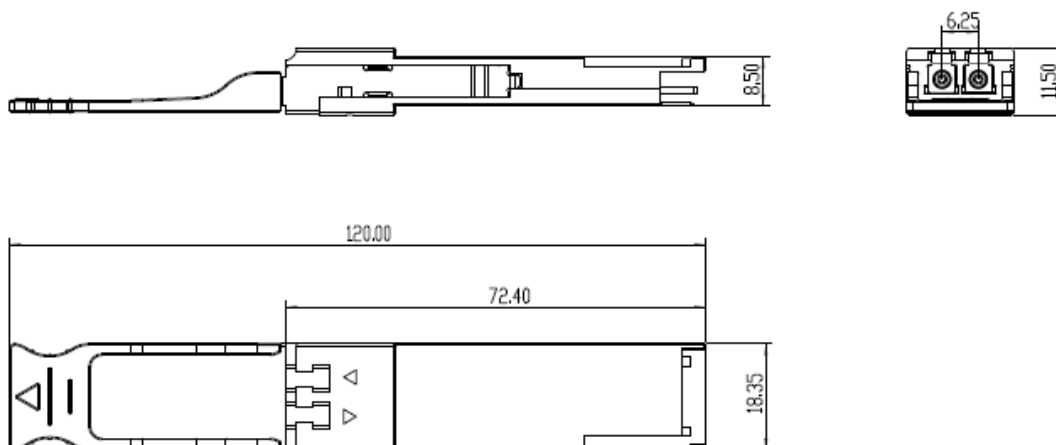


This product converts the 4-channel 25Gb/s electrical input data into LAN WDM optical signals, by a driven 4-wavelength Distributed Feedback Laser (DFB) array. The light is combined by the MUX as 100Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 100Gb/s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

ESD

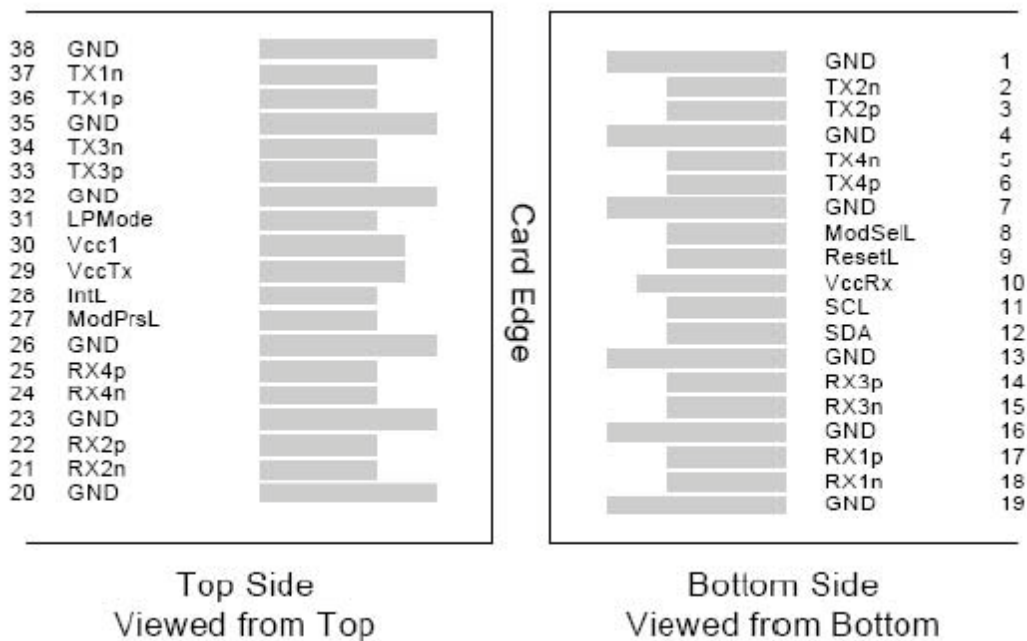
This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Dimensions



ALL DIMENSIONS ARE $\pm 0.2\text{mm}$ UNLESS OTHERWISE SPECIFIED UNIT: mm

Electrical Pad Layout



Pin Assignment

<i>PIN #</i>	<i>Symbol</i>	<i>Description</i>	<i>Remarks</i>
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 25Gbs 4X PLUGGABLE TRANSCEIVER – SFF-8665