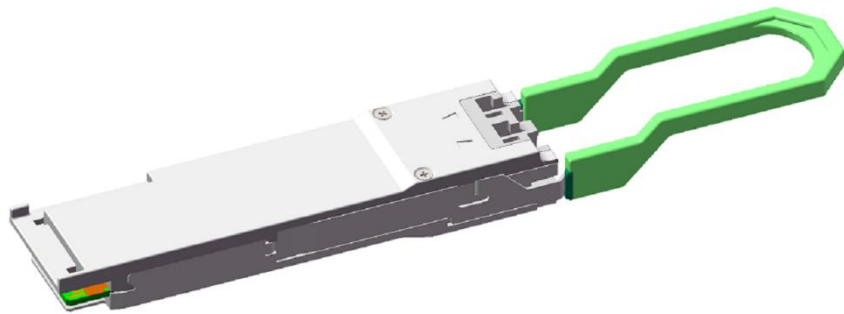


GL2H-Q5SM31FR4C

QSFP56 200Gb/s 1310nm 2km LC Transceiver

PRODUCT FEATURES

- Up to 2km transmission on single mode fiber (SMF) with FEC
- Compliant with CMIS4.0 Management interface specifications
- Compliant with 200G-FR4 optical specifications
- Compliant with IEEE Std 802.3bs
- Compliant with SFF-8679
- 4x53.125Gb/s electrical interface (200GAUI-4)
- Single +3.3V power supply
- Case temperature range: 0 ~ +70°C
- Maximum power consumption 7W
- Duplex LC connector
- RoHS complaint



APPLICATIONS

- 200G BASE-FR4 Ethernet
- Data center interconnection

PRODUCT DESCRIPTION

FIBRECROSS's 200G QSFP56 FR4 is a 4×50Gbps single mode fiber, hot-plug-gable optical transceiver. The unique technology enables the integration of 4 transmitters, 4 receivers and an optical MUX/DeMUX into a small form factor package that delivers a 200Gbps data link in a compact QSFP56 footprint. The optical connectivity is based on two Single mode Fiber (SMF) LC connectors, one for Tx and one for Rx. The Tx and Rx each consist of 4 50Gbps Coarse Wavelength Division Multiplex (CWDM) channels, whose wavelengths are in the 1310nm range. The 200G QSFP56 FR4 transceiver is designed for applications with a reach up to 2km and with the use of FEC.

Table1. Ordering information

Product part Number	Date Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance	Temperature Range (Tcase) (°C)	
GL2H-Q5SM31FR4C	200	SMF	1271nm 1291nm 1311nm 1331nm	2km	0~70	Commercial

Table2. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	RH	10	90	%
Supply Voltage	Vcc	0	4	V

Table3. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0		+70	°C
Supply Voltage	Vcc	3.14	3.3	3.46	V
Pre-FEC BER				2.4×10^{-4}	
Power Consumption	P _{Diss}			7	W
Link Distance		2		2000	m

Table4. Transmitter Optical Specifications

Transmitter Parameter	Lane	Min	Typical	Max	Units
Lane Wavelength Range	Lane 0	1264.5	1271	1277.5	nm
	Lane 1	1284.5	1291	1297.5	nm
	Lane 2	1304.5	1311	1317.5	nm
	Lane 3	1324.5	1331	1337.5	nm
Modulation Format	PAM4				
Average launch Power per lane		-4.2		4.7	dBm
Total Average launch power				10.7	dBm
Outer Optical Modulation Amplitude (OMA _{outer}), each lane		-1.2		4.5	dBm
Average Launch Power per Lane @ TX Off State				-30	dBm
Launch Power in OMA _{outer} minus TDECQ, each Lane					dBm
for ER ≥ 4.5dB		-2.6			
for ER < 4.5dB		-2.5			
Transmitter and Dispersion Eye Closure for PAM4, each Lane				3.3	dB
Extinction Ratio		3.5			dB
Relative Intensity Noise (OMA)				-132	dB/Hz
Side-Mode Suppression Ration (SMSR)		30			dB
Optical Return Loss Tolerance				16.5	dB
Transmitter Reflectance				-26	dB
Transmitter Output Power Monitoring Accuracy		-3		3	dB

Table5. Receiver Optical Specifications

Receiver Parameter	Lane	Min	Typical	Max	Units
Lane Wavelength Range	Lane 0	1264.5	1271	1277.5	nm
	Lane 1	1284.5	1291	1297.5	nm
	Lane 2	1304.5	1311	1317.5	nm
	Lane 3	1324.5	1331	1337.5	nm
Modulation Format	PAM4				
Damage Threshold		5.7			dBm
Average Receive Power, each lane		-8.2		4.7	dBm
Receiver Power, each lane (OMA)				4.5	dBm
Receiver Reflectance				-26	dB
Difference in receive Power between any Two Lanes(OMA _{outer})				4.1	dBm
Receiver Sensitivity each lane (OMA _{outer})				-6.0	dBm
Stressed Receiver Sensitivity (OMA _{outer}), each				-3.6	dBm
Stressed Conditions for Stress Receiver Sensitivity					
Stressed Eye Closure for PAM4 (SECQ), Lane under Test			3.3		dB
OMA _{outer} of each Aggressor Lane			0.5		dBm

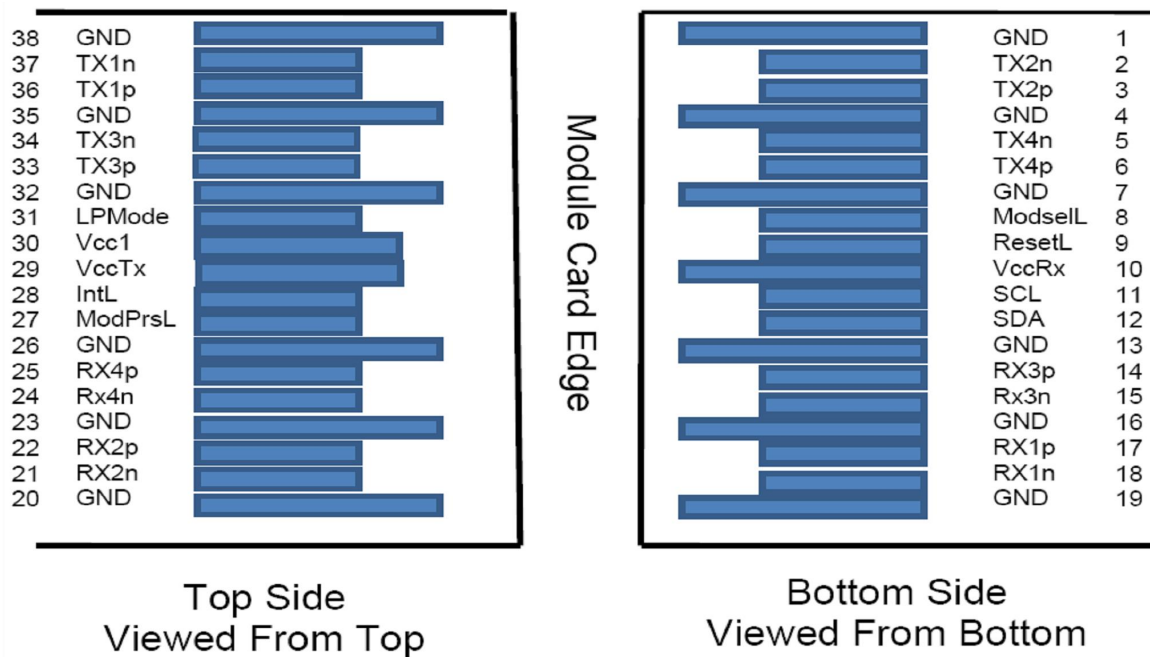
Table6. Receiver Output Power Thresholds for Loss of Signal (LOS)

Parameter	Min	Typical	Max	Units
RX_LOS_Assert Min/Max	-30.0			dBm
RX_LOS_De-Assert Min/Max			-10.0	dBm
RX_LOS_Hysteresis	0.5			dB

Table7. Digital Diagnostic Monitoring Specifications

Parameters	Unit	Specification
Temperature Monitor absolute error	degC	± 3
Voltage Monitor absolute error	%	± 5
I_bias Monitor absolute error	%	± 10
Received Power (Rx) Monitor absolute error	dB	± 3.0
Transmit Power (Tx) Monitor absolute error	dB	± 3.0

Pin Description

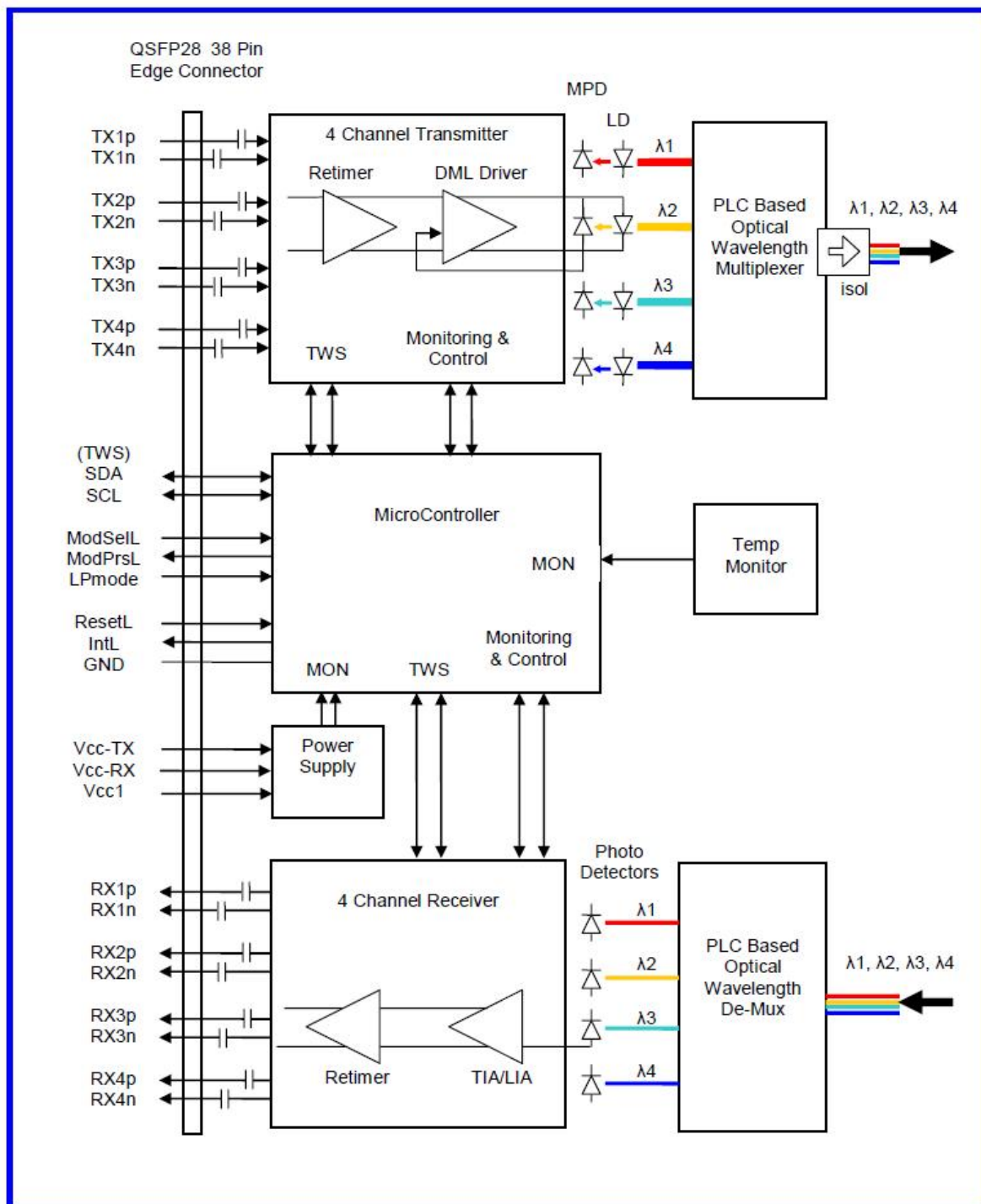


QSFP compliant 38-pin connector

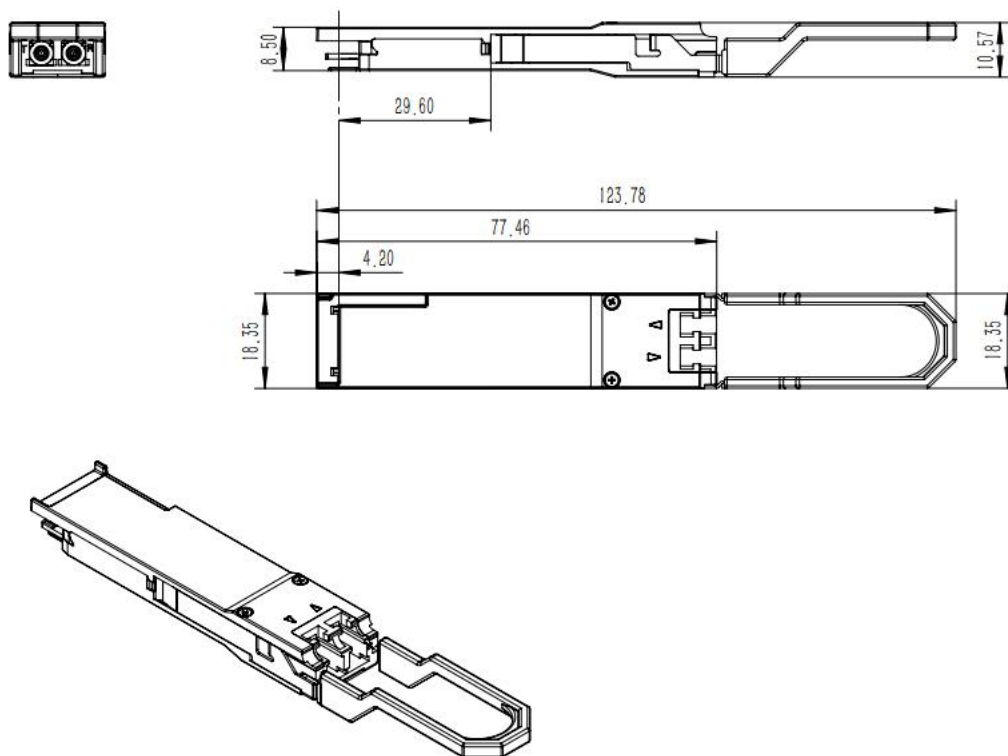
QSFP Transceiver Pinout

Pin No.	Logic	Symbol	Description	Plug Sequence
1		GND	Ground	1
2	CML-I	TX2n	Transmitted Inverted Data Input	3
3	CML-I	TX2p	Transmitted Non-Inverted Data Input	3
4		GND	Ground	1
5	CML-I	TX4n	Transmitted Inverted Data Input	3
6	CML-I	TX4p	Transmitted Non-Inverted Data Input	3
7		GND	Ground	1
8	LVTTL-I	ModSeil	Module Select	3
9	LVTTL-I	ResetL	Module Reset	3
10		Vcc Rx	+3.3 VDC Receiver Power Supply	2
11	LVC MOS-I/O	SCL	Serial Clock for I2C Interface	3
12	LVC MOS-I/O	SDA	Serial Data for I2C Interface	3
13		GND	Ground	1
14	CML-O	RX3p	Receiver Non-Inverted Data Output	3
15	CML-O	RX3n	Receiver Inverted Data Output	3
16		GND	Ground	1
17	CML-O	RX1p	Receiver Non-Inverted Data Output	3
18	CML-O	RX1n	Receiver Inverted Data Output	3
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	RX2n	Receiver Inverted Data Output	3
22	CML-O	RX2p	Receiver Non-Inverted Data Output	3
23		GND	Ground	1
24	CML-O	RX4n	Receiver Inverted Data Output	3
25	CML-O	RX4p	Receiver Non-Inverted Data Output	3
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	3
28	LVTTL-O	IntL	Interrupt	3
29		Vcc Tx	+3.3 VDC Transmitter Power Supply	2
30		Vcc1	+3.3 VDC Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	3
32		GND	Ground	1
33	CML-I	TX3p	Transmitted Non-Inverted Data Input	3
34	CML-I	TX3n	Transmitted Inverted Data Input	3
35		GND	Ground	1
36	CML-I	TX1p	Transmitted Non-Inverted Data Input	3
37	CML-I	TX1n	Transmitted Inverted Data Input	3
38		GND	Ground	1

Module Block Diagram



Mechanical Dimensions



Regulatory Compliance

Agency	Standard	Certificate /Comments
CE-EMC	EN 55032: 2015	17706703 003
	EN 55024: 2010+A1	
REACH	REACH SVHC 197	68.420.19.0344.01
FCC	FCC Rules and Regulations Part 15 Subpart B Class B	MTi190422E141C
RoHS	2011/65/EU and amendment (EU) 2015/863	68.420.17.1030.01