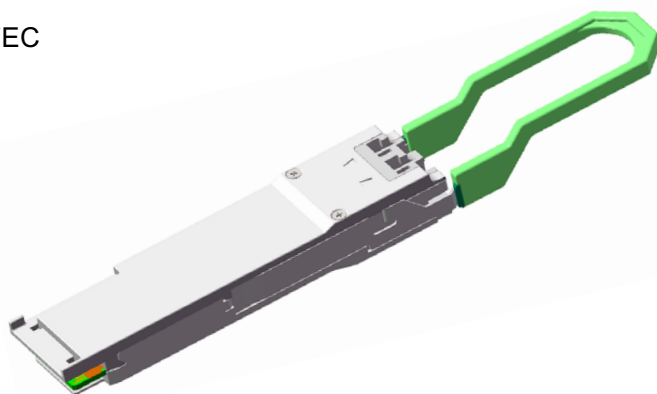


OP-QSFP56-FR4

200G QSFP56 FR4, SM 1310nm 2km DDM

FEATURES

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



APPLICATION

- 200GBASE-FR4 Ethernet
- Switch and Router Connections
- Data Centers
- Other 200G Interconnect requirements

DESCRIPTION

The OP-QSFP56-FR4 200G QSFP56 FR4 is a 4×50Gbps singlemode fiber, hot pluggable optical transceiver. 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 Singlemode 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. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Storage Temperature Range	T _{STG}	-40	+85	°C
Supply Voltage	V _{CC}	0	4	V
Relative Humidity	RH	10% to 90% non-condensing		

Table2. Operating Conditions

Parameter	Symbol	Min	Max	Units
Case Temperature- Operating	T _{CASE}	0	70	°C
Supply Voltage	V _{CC}	3.14	3.46	V
Power Consumption	P _{DISS}		7	W
Pre-FEC Bit Error Ratio			2.4x10 ⁻⁴	
Link Distance		2	2000	M

Table3. Wavelength Lane Assignments

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

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 for ER ≥ 4.5dB for ER < 4.5dB		-2.6 -2.5			dBm
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

QSFP56 Connector and Pinout Description

The electrical interface to the transceiver is a 38 pins edge connector. The 38 pins provide high speed data, low speed monitoring and control signals, I2C communication, power and ground connectivity. The top and bottom views of the connector are provided below, as well as a table outlining the contact numbering, symbol and full description.

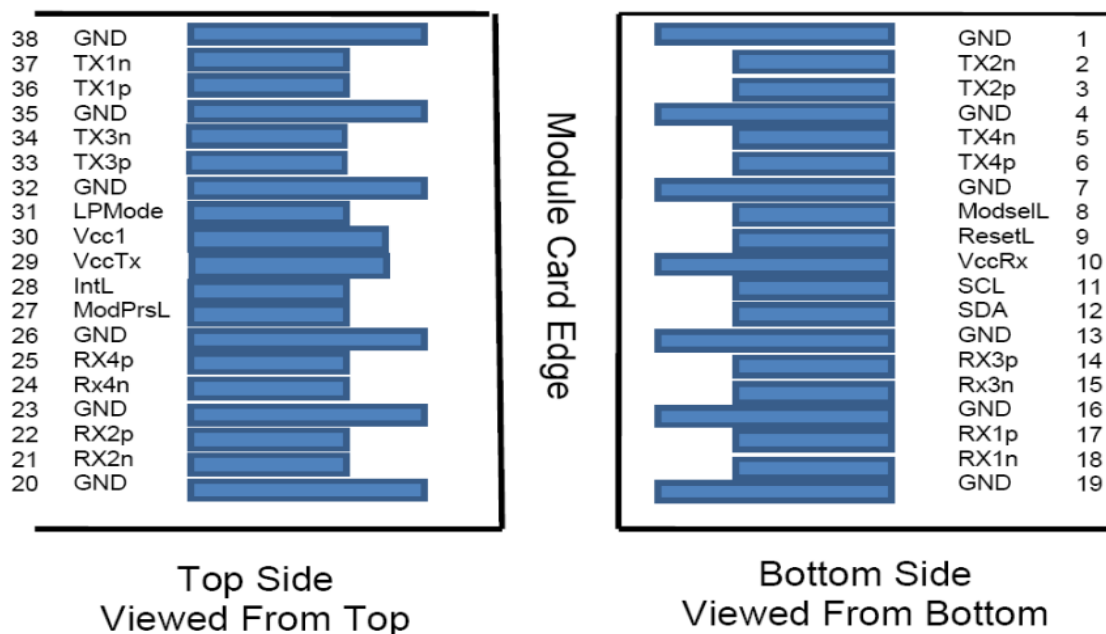
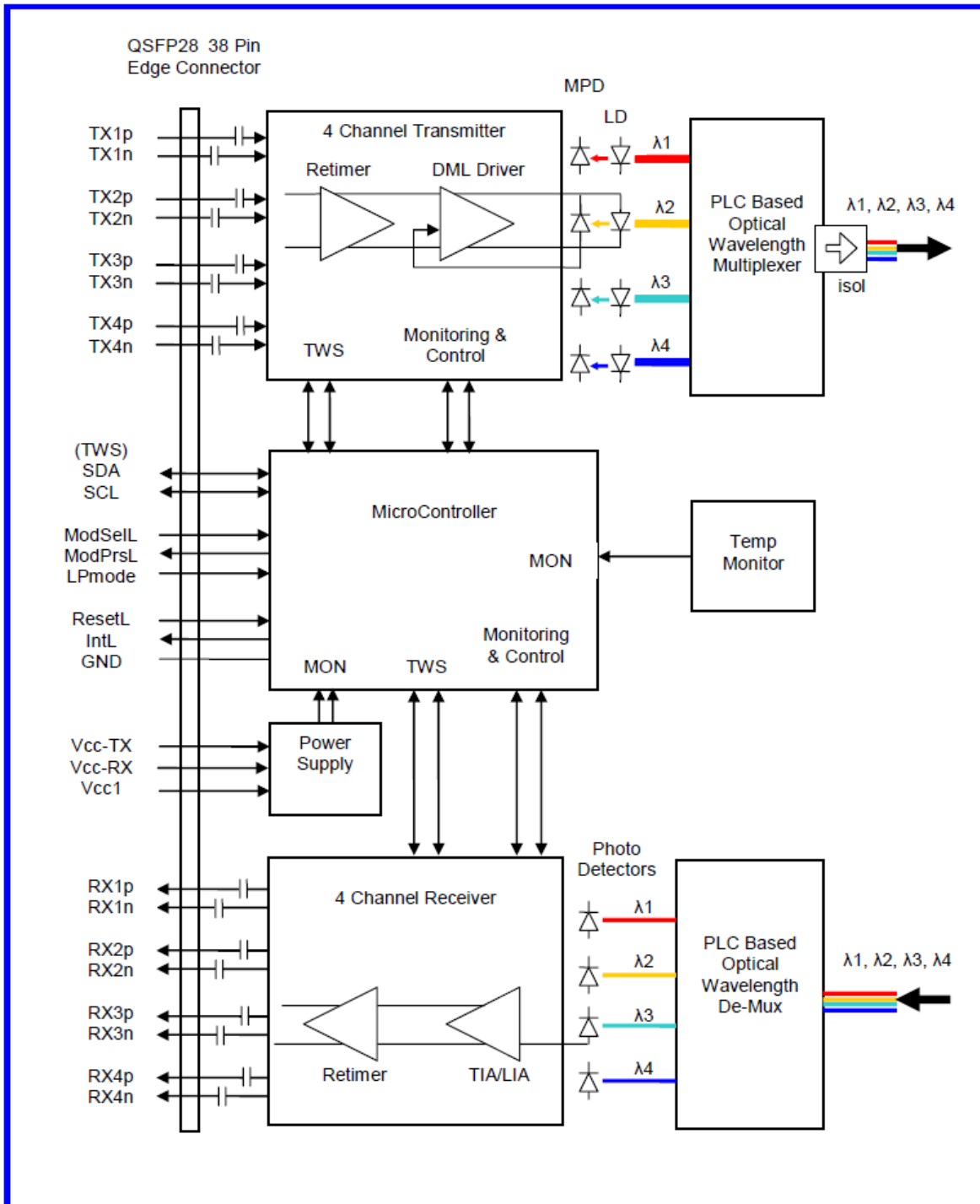


Figure 1. QSFP compliant 38-pin connector

Module Block Diagram



Mechanical Specifications

Unit: mm

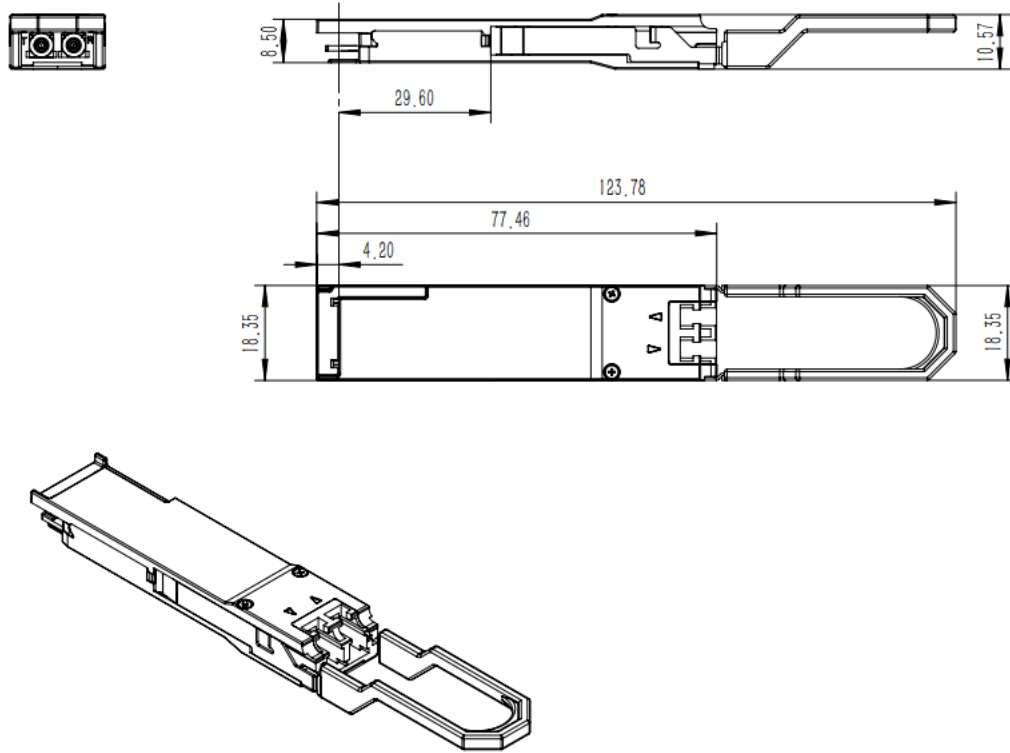


Figure 3. Mechanical Dimensions

Ordering information

Part Number	Product Description
OP-QSFP56-FR4	200G QSFP56 FR4, Single mode 1310nm 2km DOM