

EQP200-FR4

200Gb/s 2Km QSFP56 FR4 Transceiver module

PRODUCT FEATURES

- Up to 50Gbps data rate per channel by PAM4 modulation
- 4 duplex channels transmitters and receivers
- Integrated CWDM LD and PD array
- LC/UPC connecting interface compliant
- Single +3.3V power supply
- DDM function implemented
- Hot-pluggable QSFP56 form factor
- Transmission length up to 2km
- Low power dissipation:<6.5w
- International class 1 laser safety certified
- Operating temperature range: 0°C ~ +70 °C
- Compliant with ROHS10

APPLICATIONS

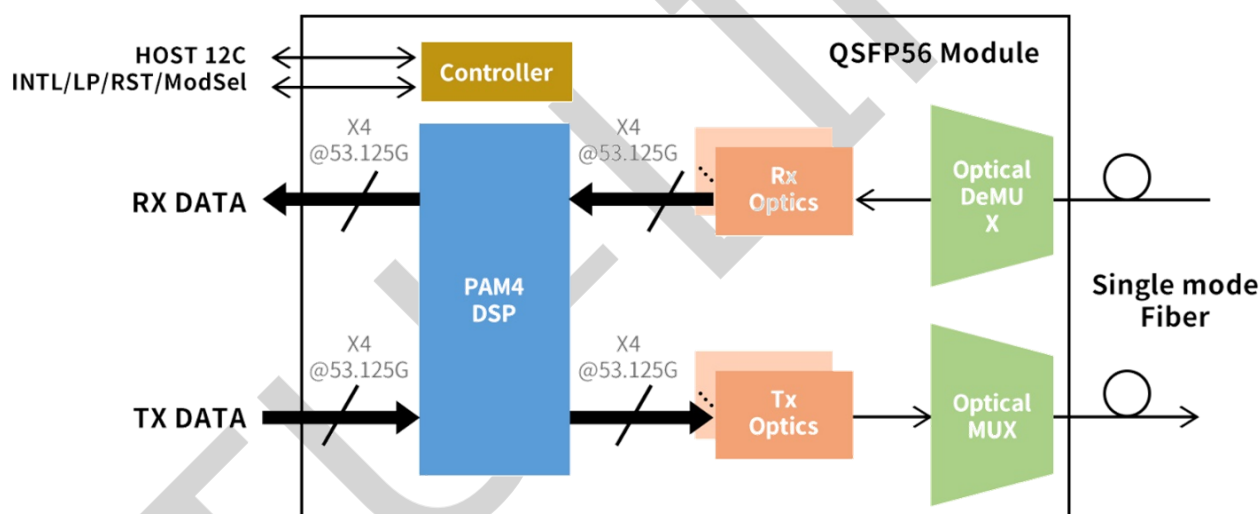
- Switch & Router Connections
- Data Centers
- Other 200G Interconnect Requirements.

DESCRIPTIONS

The 200G QSFP56 FR4 Transceiver is designed to transmit and receive optical data links 50 Gb/s bit rate per channel with PAM4 modulation format via up to 2km single mode fiber. It is hot pluggable transceiver with QSFP56 package.

They are compliant with SFF-8665, SFF-8679, SFF-8024, SFF-8636 (or CMIS REV4.0), IEEE 802.3bs Annex120E, IEEE 802.3cd and OIF-CEI-04.0 56G-VSR-PAM4.

Module Block Diagram



Ordering Information

Part No.	Data Rate(optical)	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
EQP200-FR4	200G	DML	SM	2KM	LC	0°C~ +70°C	Y

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Supply Voltage	V	0	3.6	V	

Storage Temperature	T _{STG}	-40	85	C	Ambient
Relative Humidity	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature Range	T _c	°C	0		70
Power Supply Voltage	V _{cc}	V	3.14	3.3	3.46
Baud Rate(Per channel)	BR	Gb/s		26.5625	
Bit Error Ratio	BER				2.4E-4
Max Supported Link Length(OM4)	L	Km			2

Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Supply Voltage	V _{CC} VCC3.3-Tx VCC3.3-Rx	V	3.135	3.3	3.465	
Power Consumption	P _c	W			6.5	
Transceiver Power-on Initialize Time		ms			2000	
Transmitter						
Differential peak-to-peak input voltage tolerance		mV	900			
Differential termination mismatch		%			10	
Differential input return loss(SDD11)		dB			See CEI-56G-VSR	
Common-mode to differential conversion and differential to common-mode conversion(SCD11,SDC11)		dB			See CEI-56G-VSR	
Receiver						
Differential peak-to-peak output voltage		mV			900	
DC Common Mode Voltage	V _{cm}	mV	-0.35		2.85	
AC Common Mode Noise, RMS		mV			17.5	
Differential termination mismatch		%			10	
Differential output return loss(SDD22)		dB			See CEI-56G-VSR	
Common-mode to differential conversion and differential to common-mode conversion(SCD22,SDC22)		dB			See CEI-56G-VSR	
IIC communication						

IIC Clock frequency	-	KHZ	/	400	1000	
clock stretching	-	us	/	/	500	
Data hold time	-	ns	/	/	/	

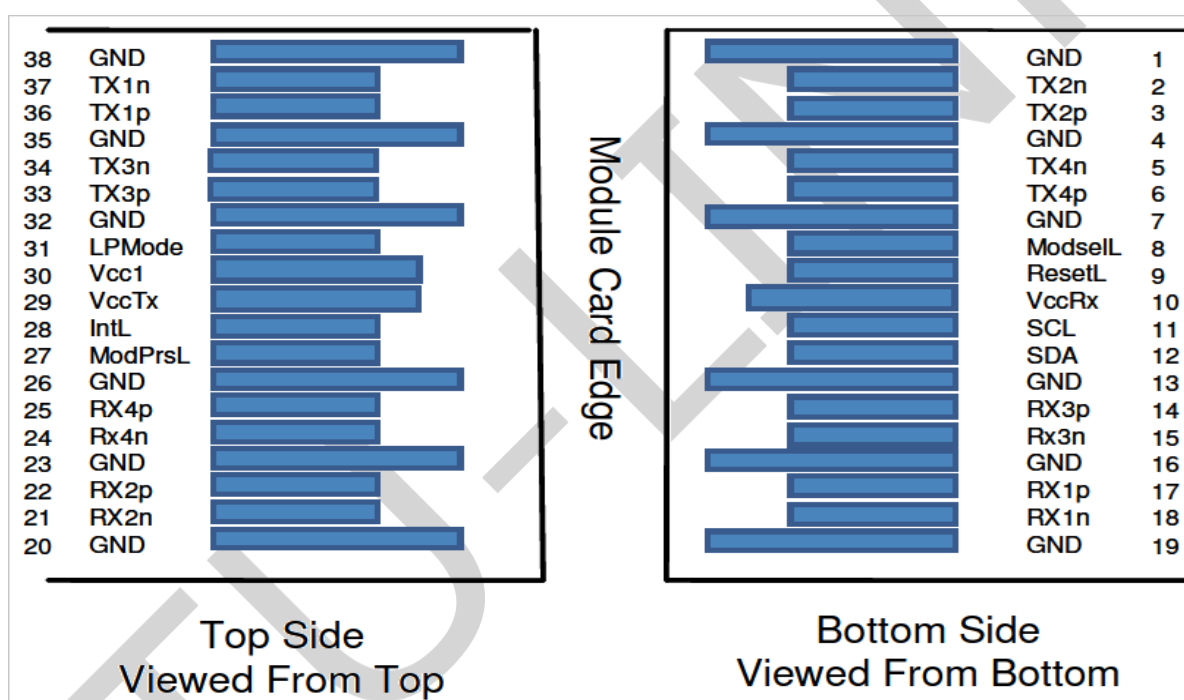
Optical and Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Transmitter (per Lane)						
Signaling Speed per Lane		GBd		26.5625		
Modulation format				PAM4		
Center wavelength	WL	nm	1264.5	1271	1277.5	
			1284.5	1291	1297.5	
			1304.5	1311	1317.5	
			1324.5	1331	1337.5	
Side-mode suppression ratio	SMSR	dB	30			
Average Launch Power per Lane	TXPx	dBm	-4.2		4.7	
Tx OMA per lane	TxOMA	dBm	-1.2		4.5	
Optical Extinction Ratio	ER	dB	3.5			
Transmitter and dispersion eye closure for PAM4 per Lane	TDECQ	dB			3.3	
Optical return loss tolerance	ORL	dB			16.5	
Relative Intensity Noise	RIN	dB/Hz			-132	
Receiver(per lane)						
Signaling Speed per Lane				26.5625		
Center wavelength	WL	nm	1264.5	1271	1277.5	
			1284.5	1291	1297.5	
			1304.5	1311	1317.5	
			1324.5	1331	1337.5	
Damage Threshold	DT	dBm	5.7			
Average Launch Power per Lane	RXP	dBm	-8.2		4.7	
Receiver reflectance	Rfl	dB			-26	
Difference in receive power between any two lanes		dB			4.1	
Receiver sensitivity (OMOuter)		dBm			-6	
Stressed receiver sensitivity (OMOuter)		dBm			-3.6	

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	± 3	$^{\circ}\text{C}$	Internal
Voltage	0 to VCC	3%	V	Internal
Tx Bias Current (Each Lane)	0 to 10	10%	mA	Internal
Tx Output Power (Each Lane)	-4.2 to +4.7	± 3	dB	Internal
Rx Receive Power (Each Lane)	-8.2 to +4.7	± 3	dB	Internal

Pin Diagram

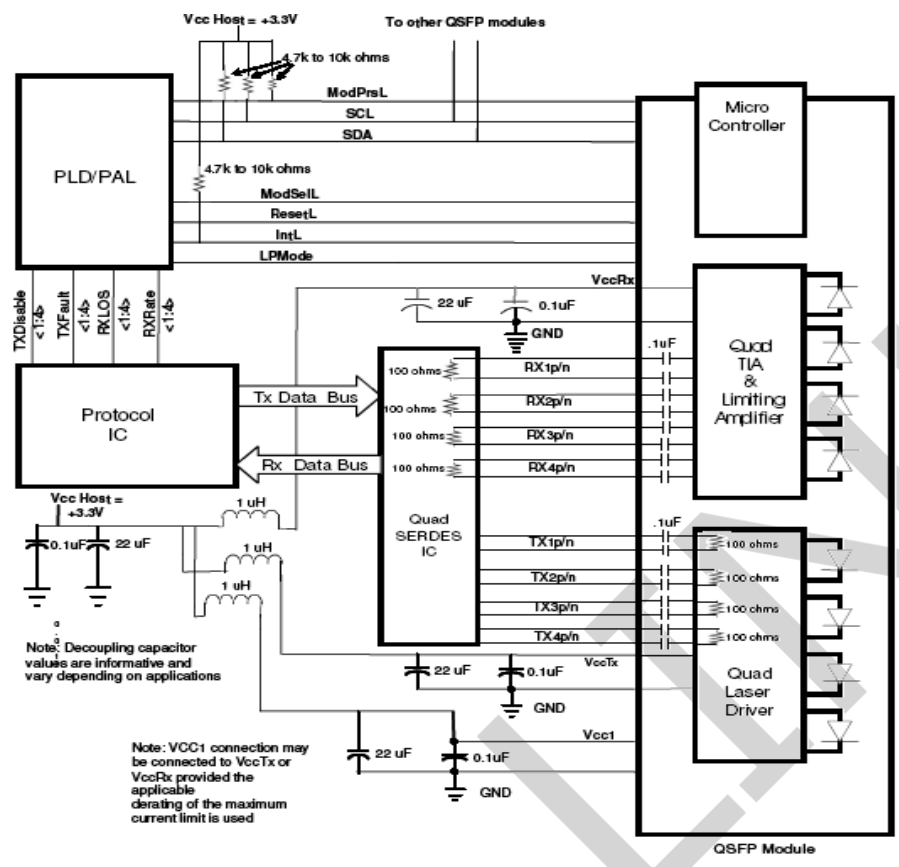


Pin Definitions

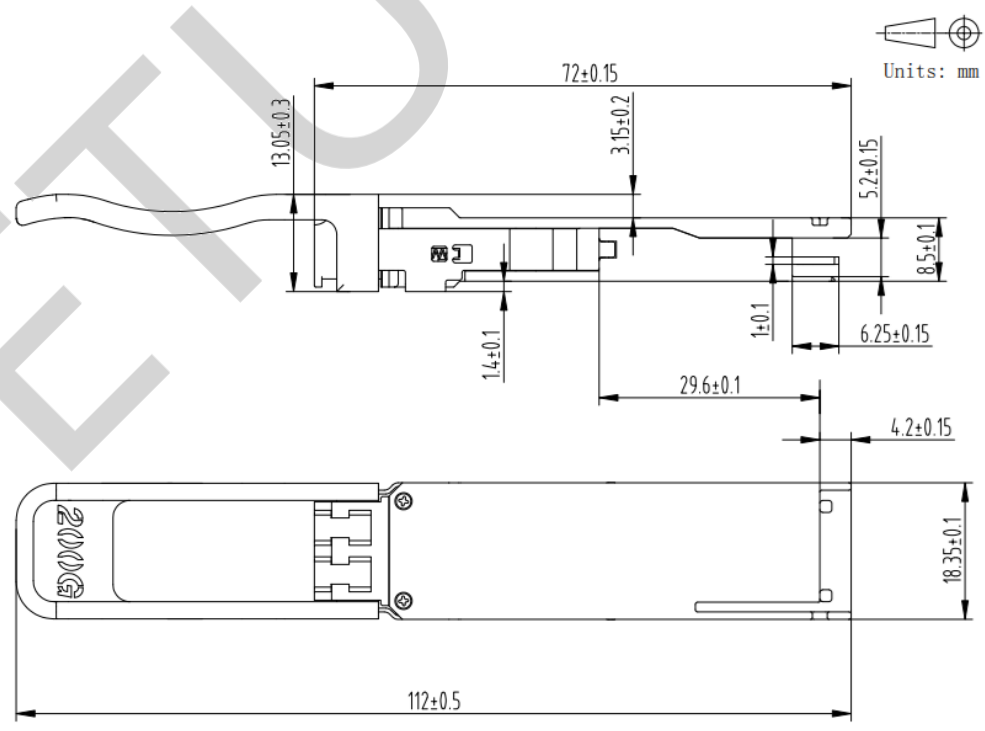
Pin	Name	Description	Plug Sequence	Notes
1	GND	Ground	1	
2	Tx2n	Transmitter Inverted Data Input	3	
3	Tx2p	Transmitter Non-Inverted Data Input	3	
4	GND	Ground	1	
5	Tx4n	Transmitter Inverted Data Input	3	
6	Tx4p	Transmitter Non-Inverted Data Input	3	
7	GND	Ground	1	
8	ModSell	Module Select	3	

9	ResetL	Module Reset	3	
10	Vcc Rx	+3.3 V Power supply receiver	2	
11	SCL	2-wire serial interface clock	3	
12	SDA	2-wire serial interface data	3	
13	GND	Ground	1	
14	Rx3p	Receiver Non-Inverted Data Output	3	
15	Rx3n	Receiver Inverted Data Output	3	
16	GND	Ground	1	
17	Rx1p	Receiver Non-Inverted Data Output	3	
18	Rx1n	Receiver Inverted Data Output	3	
19	GND	Ground	1	
20	GND	Ground	1	
21	Rx2n	Receiver Inverted Data Output	3	
22	Rx2p	Receiver Non-Inverted Data Output	3	
23	GND	Ground	1	
24	Rx4n	Receiver Inverted Data Output	3	
25	Rx4p	Receiver Non-Inverted Data Output	3	
26	GND	Ground	1	
27	ModPrsL	Module Present	3	
28	IntL	Interrupt	3	
29	Vcc Tx	+3.3 V Power supply transmitter	2	
30	Vcc1	+3.3 V Power Supply	2	
31	LPMode	Low Power Mode	3	
32	GND	Ground	1	
33	Tx3p	Transmitter Non-Inverted Data Input	3	
34	Tx3n	Transmitter Inverted Data Input	3	
35	GND	Ground	1	
36	Tx1p	Transmitter Non-Inverted Data Input	3	
37	Tx1n	Transmitter Inverted Data Input	3	
38	GND	Ground	1	

Recommended Interface Circuit



Mechanical Diagram



Revision History

Version No.	Date	Description
1.0	Aug 18, 2022	Preliminary datasheet
2.0	Sep 20,2024	Format change

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