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QDD-200G-SR4-S Compatible QSFP-DD 200GBASE-SR4 850nm 100m	
MPO Type with DDM	**QT-MM4-M12-QSFPDD-200G-100M**

Description

General

This QuickTreX® QSFP-DD tranceiver is a quad small form-factor pluggable module for serial optical data communications such as IEEE 802.3cd 200GBASE-SR4. The 200G QSFP56 SR4 is a 4x 53.125Gbps multi-mode fiber, hot pluggable optical transceiver. It is with the QSFP 38-pin connector to allow hot plug capability. The internally ac coupled high speed serial I/O simplifies interfacing to external circuitry. A serial EEPROM in the transceiver allows the user to access transceiver digital diagnostic monitoring and configuration data via the 2-wire QSFP Management Interface.

Transmitter Section

The transmitter section uses four Vertical Cavity Surface Emitted Lasers (VCSEL).In addition, this component is also class 1 laser that compliant with International Safety Standard IEC-60825-1:2014. It complies with EN60825-1:2014/A11:2021 and FDA 21 CFR 1040.10 and 1040.11

Receiver Section

The receiver incorporates four GaAs PIN photodiodes integrated with four trans-impedance preamplifiers (TIA) and four limiting post-amplifier ICs.

Features

- Single +3.3V Power Supply
- Compliant with SFF-8679, QSFP+4X
- Compliant with SFF-8636, 4-lane modules
- Compliant with CMIS 4.0
- Compliant with IEEE 802.3cd 200GBASE
- 4x53.125Gb/s electrical Interface(200GAUI-4)
- PAM4 with CDR
- Up to 70m with OM3 MMF with FEC
- Up to 100m with OM4 MMF with FEC
- Class 1 Laser International Safety Standard IEC-60825-1:2014 Compliant. Complies with EN60825-1:2014/A11:2021 and FDA 21 CFR 1040.10 and 1040.11
- Commercial Operation Temp.: 0 °C to +70 °C
- MPO optical connector
- RoHS Compliant

Applications

- 200GBASE-SR4 200G Ethernet Links
- Data Center Switches and Router

Performance Specifications

Absolute Maximum Ratings					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Supply Voltage	V_{CC}	-0.3	-	3.6	V
Storage Temperature	T_S	-40	-	85	°C
Relative Humidity(non-condensing)	RH	10	-	85	%

Recommended Operating Conditions and Power Supply Requirements					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**
Operating Case Temperature	T_{OP}	0	-	70	°C
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Data Rate, each Channel	B	-	53.125	-	Gbps
Operating Distance(@OM3 MMF)	L	-	-	70	m
Operating Distance(@OM4 MMF)	L	-	-	100	m
Power Dissipation	PD	-	-	4	W

Optical Characteristics

Transmitter Optical Characteristics					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Signaling Rate, each lane(range)	-	26.5625±100ppm			Gbps
Modulation Format	-	PAM4 CDR			
Average Launch Power, each Lane	$P_{O, AVG}$	-6.5	-	4	dBm
Optical Modulation Amplitude(OMA), each lane	$P_{O, OMA}$	-4.5	-	3	dBm
Center Wavelength	λ_C	840	850	860	nm
Spectral Width	$\Delta\lambda_{(RMS)}$	-	-	0.6	nm
Launch power in OMAouter minus TDECQ	$P_{O, TDECQ}$	-5.9	-	-	dBm
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane	-	-	-	4.5	dB
Extinction Ratio, each lane	ER	3	-	-	dB
Optical return loss tolerance	P_R	-	-	12	dB
Encircled flux	Ef	≧86% at 19 μm ≦30% a5 4.5 μm			-
Receiver Optical Characteristics					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Signaling Rate, each lane(range)	-	26.5625±100ppm			Gbps
Damage Threshold, each lane	THd	5	-	-	dBm
Average receive power, each lane	P_{in}	-8.4	-	4	dBm
Center Wavelength	λ_C	840	850	860	nm
Receiver Reflectance	R_R	-	-	-12	dB
Receiver Power(OMA), each lane	$P_{S,OMA}$	-	-	3	dBm
Receiver Sensitivity(OMA), each lane	$Rs_{,OMA}$	Max(-6.5, SECQ-7.9)			dBm
Stressed Receiver Sensitivity(OMA), each lane	-	-	-	-3.4	dBm
Stressed eye closure for PAM4(SECQ), lane under test	-	-	4.5	-	dB.
SECQ - $10\log_{10}$(Ceq)(max), lane under test	-	-	-	4.5	dB

Digital Diagnostic Accuracy

Parameter	Typical Value	Note
Transceiver Temperature	± 3ºC	T_{OP-min} ~T_{OP-max}
Power Supply Voltage	± 3%	V_{CC}
TX Bias Current	± 10%	
TX Optical Power	± 3dB	$P_{O, AVG-min}$ ~ $P_{O, AVG-max}$
RX Optical Power	± 3dB	P_{in-min} ~ P_{in-max}

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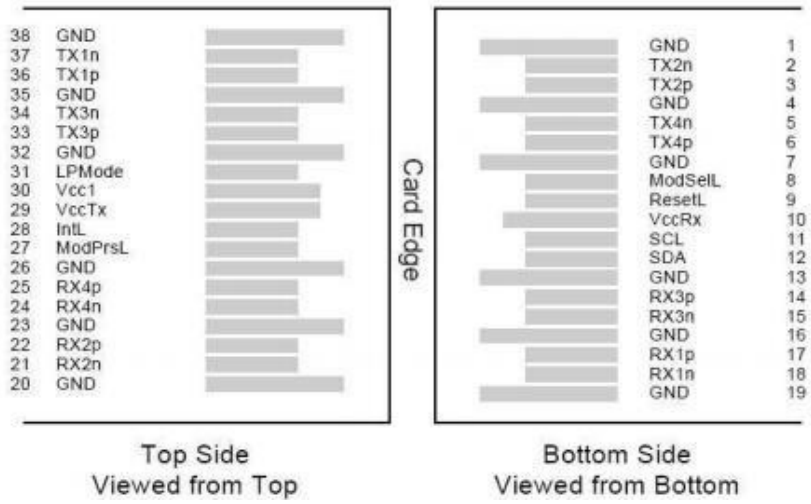
QSFP56 Transceiver Electrical Pad Layout



Pinout Table

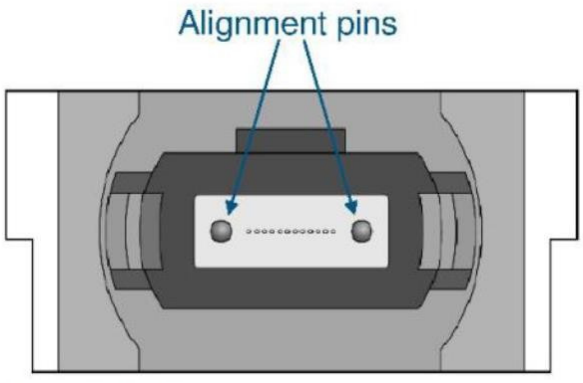
Pin	Symbol	Name/Description	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	+3.3V Power Supply Receiver	2
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	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1

21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	1
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3 V Power Supply transmitter	2
30	Vcc1	+3.3 V Power Supply	2
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Ground	1
36	Tx 1p	Transmitter Non-Inverted Data Input	
37	Tx 1n	Transmitter Inverted Data Output	
38	GND	Ground	1

Notes:

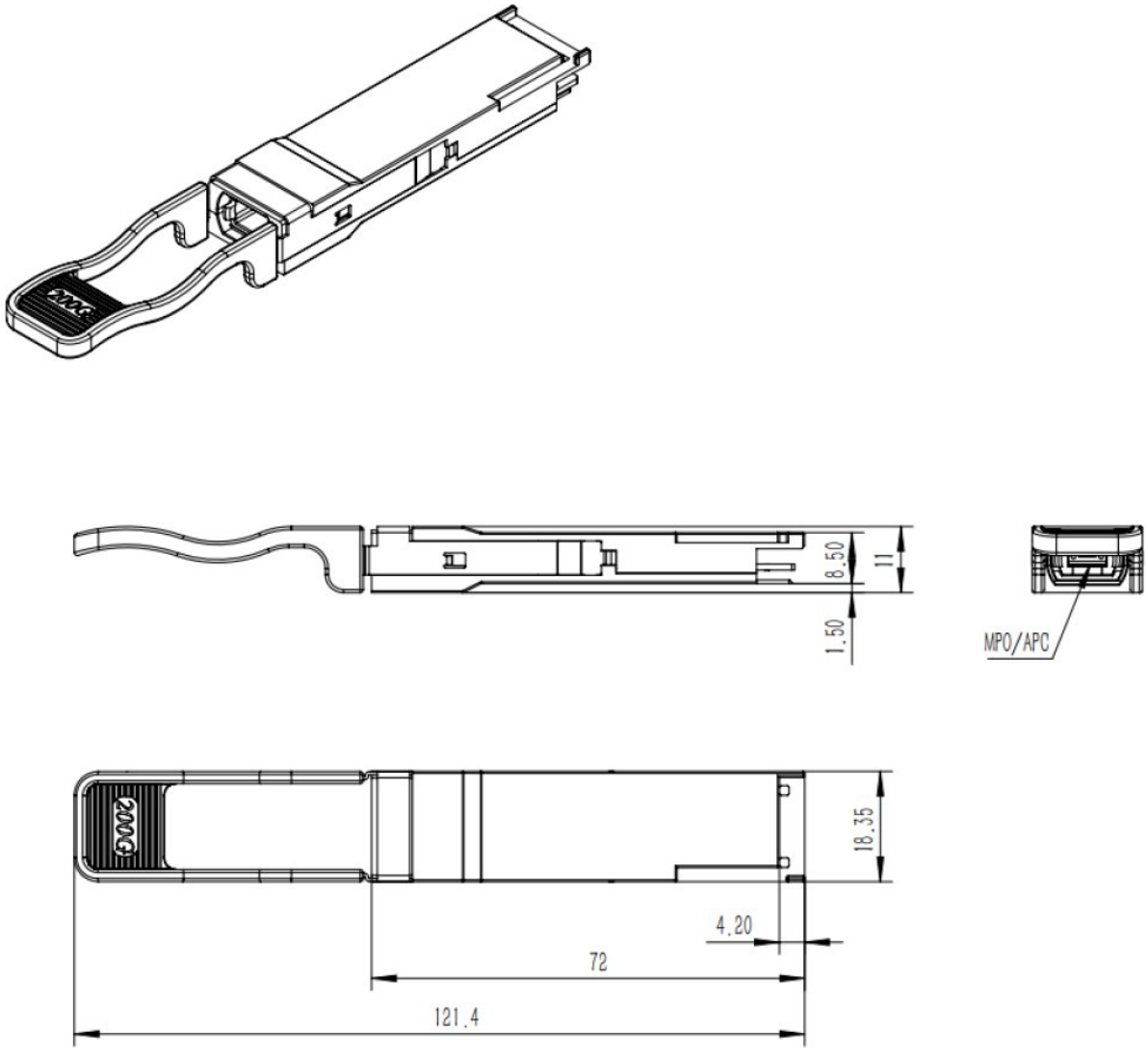
1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP+ module in any combination.

Optical interface



Transmit Channels: 1 2 3 4
Unused positions: x x x x
Receive Channels: 4 3 2 1

Package Outline Drawing



DIMENSIONS ARE IN MILLIMETERS (unit:mm)

Eye Safety

The transceiver is a class 1 laser product. It complies with EN60825-1:2014/A11:2021 and FDA 21 CFR 1040.10 and 1040.11. In order to meet laser safety requirements the transceiver shall be operated within the Absolute Maximum Ratings.

Caution

All adjustments have been done at the factory before the shipment of the devices. No maintenance and user serviceable part is required. Tampering with and modifying the performance of the device will result in voided product warranty.