

## **400G QSFP-DD SR8 Transceiver**

### **PRODUCT FEATURES**

- Support 26.5625 GBd Data rate per channel
- Maximum link length of 70m links on OM3 multimode fiber or 100m links on OM4 multimode fiber
- High Reliability 850nm VCSEL technology
- Electrically hot-pluggable
- Digital diagnostic QSFP-DD-CMIS compliant
- Compliant with QSFP-DD MSA
- Standard 16 lane with MPO connector
- Case operating temperature range: Commercial: 0°C to 70°C  
Extended: -5°C to 80°C
- Power dissipation < 10 W

### **STANDARD**

- Compliant to IEEE 802.3cd
- Compliant to QSFP-DD MSA

## I Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH	5	-	85	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	

## II Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0	-	70	°C	QD85PC8-02D
	Tcase	-5	-	80	°C	QD85PC8-02E
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC	-		2700	mA	
Data Rate(Electrical)	Dre		26.5625		GBd	Each channel
Transmission Distance	TD		-	100	m	OM4 MMF or 70m OM3

## III Optical Characteristics

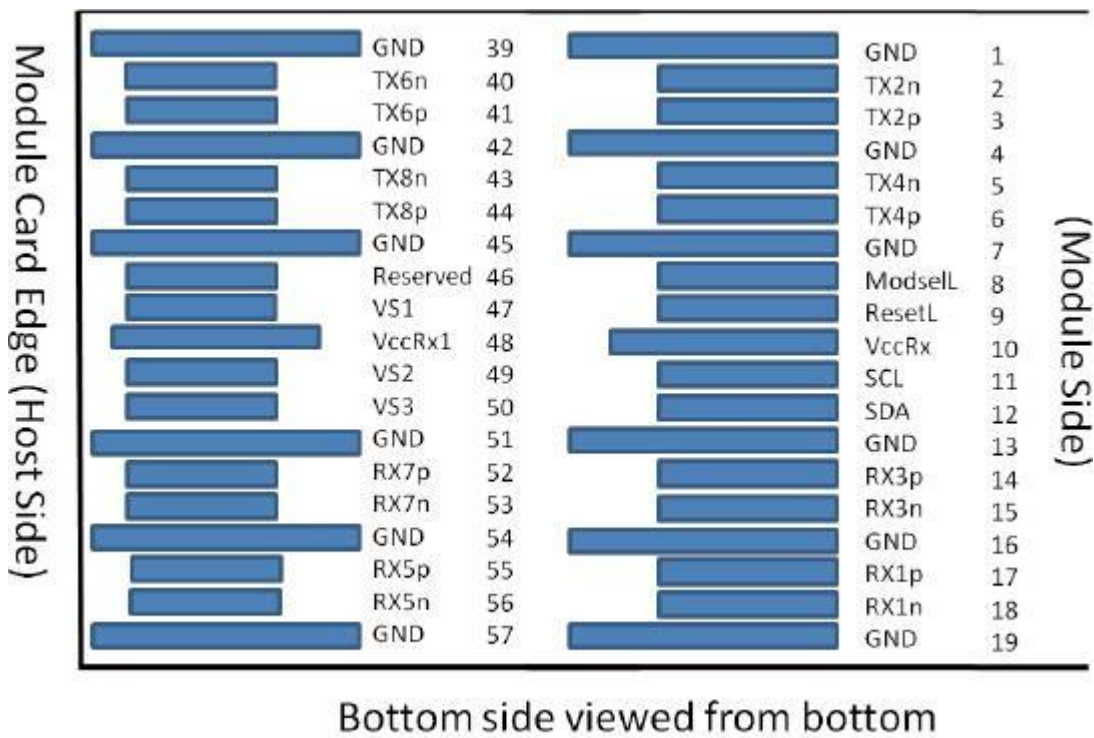
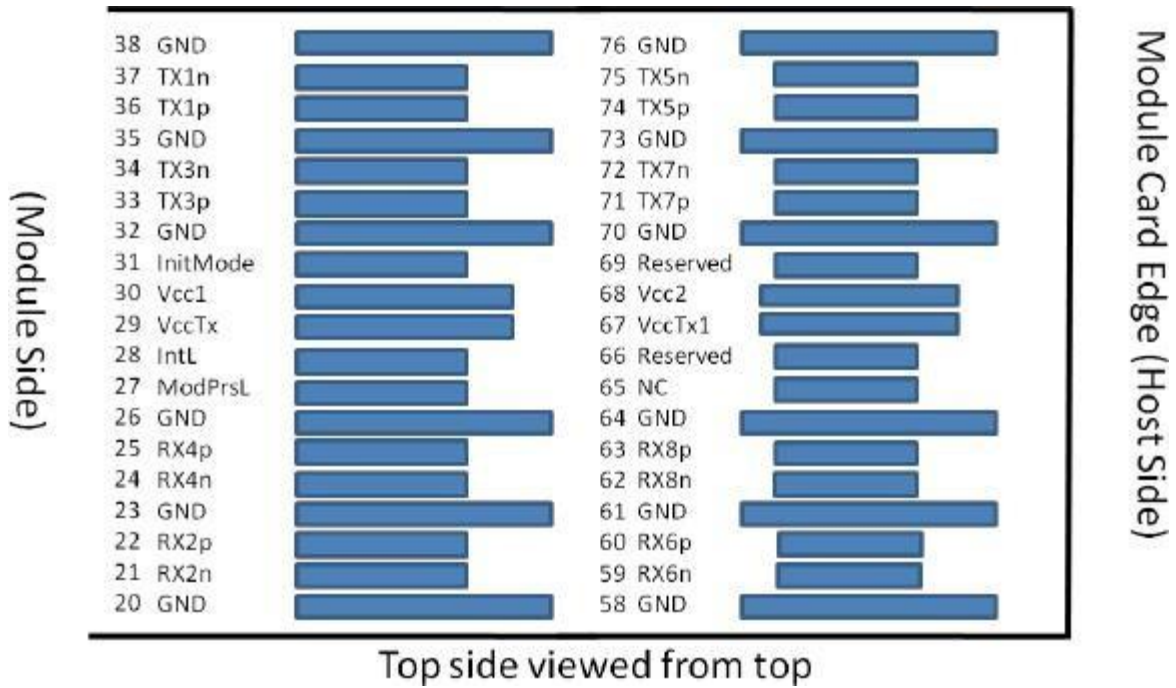
Parameter	Symbol	Min	Typ	Max	Unit	NOTE
<b>Transmitter</b>						
Wavelength	$\lambda$	840	850	860	nm	
Spectral Width (RMS)	$\sigma$			0.6	dB	
Modulation format			PAM			
Data Rate(range)			26.5625		GBd	
Data rate variation		-100		100	PPm	
Average Launch Power		-6.5		4	dBm	1
Optical modulation amplitude (OMA)		-4.5		3	dBm	2
Launch power in OMAouter minus TDECQ (min)		-5.9			dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ) (max)				4.5	dB	

Optical Extinction Ratio	ER	3			dB	
Average launch Power off per lane	Poff			-30	dBm	
Optical return loss tolerance(max)				12	dB	
<b>Receiver</b>						
Data Rate(range)			26.5625		GBd	
Data rate variation		-100		100	Ppm	
Modulation format			PAM			
Wavelength	$\lambda$	840	850	860	nm	
Damage threshold		5			dBm	4
Average receiver power	Rpow	-8.4		4	dBm	5
Receiver reflectance (max)				-12	dB	
Receiver Sensitivity (OMA) @BER2.4E-4				-7	dBm	6
Overload Receiver power (Overload)	Psat	4			dBm	
Conditions of stressed receiver sensitivity test:						
Stressed eye closure for PAM4 (SECQ)				4.5	dB	7

**Notes:**

1. Average launch power(min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Even if the TDECQ < 1dB, the OMA (min) must exceed this value.
3. TDECQ is the Transmitter and Dispersion eye closure for PAM4.
4. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level.
5. Average received power(min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
6. Receiver sensitivity (OMA) is informative.
7. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the Receiver.

## V. Pin Assignment



Pin	Symbol	Name/Description	NOTE
1	GND	Ground	1

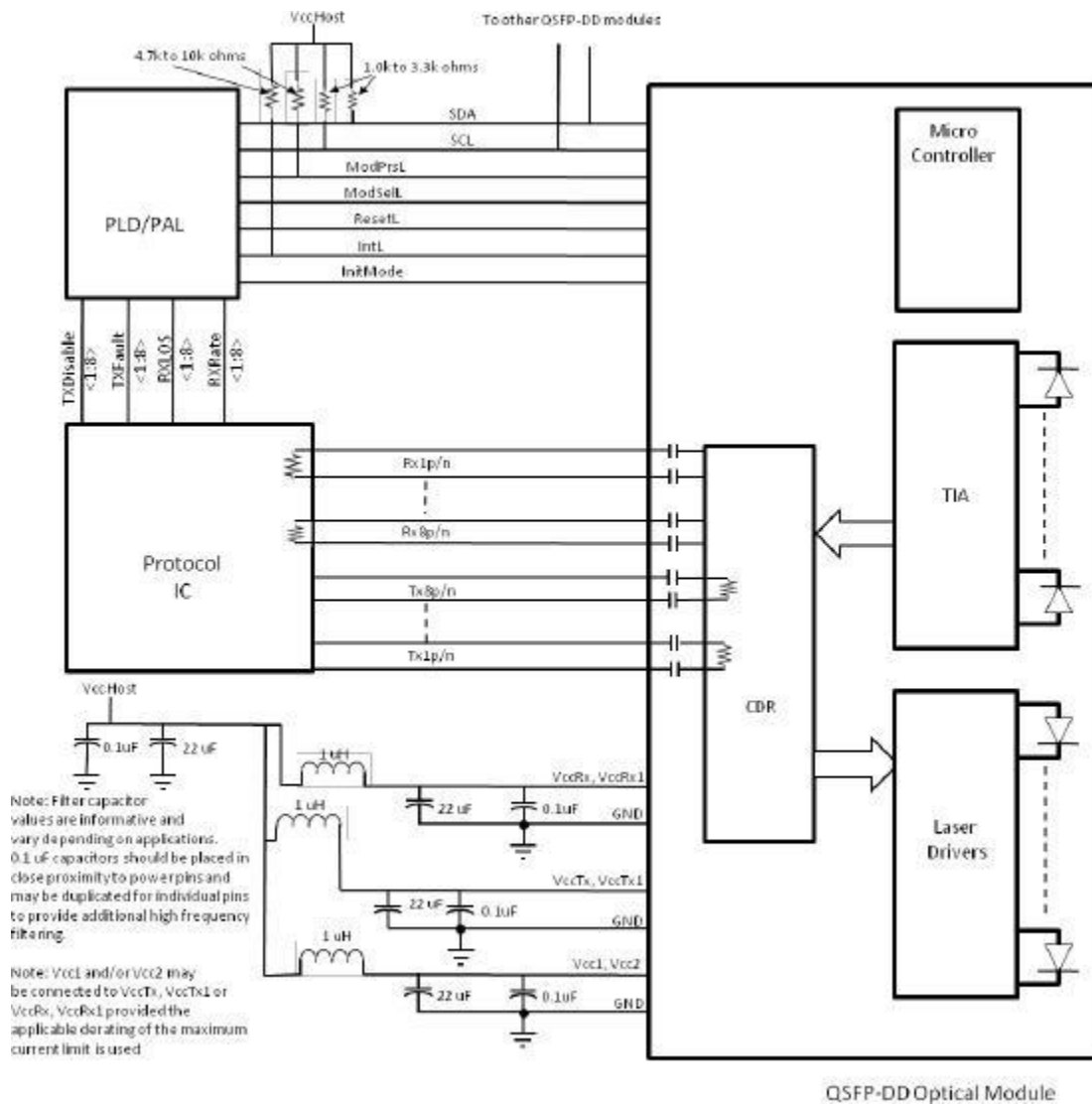
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	3.3V Power Supply Receiver	2
11	SCL	2-Wire serial 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	3.3V power supply transmitter	2
30	Vcc1	3.3V 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	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Ground	1
39	GND	Ground	1
40	Tx6n	Transmitter Inverted Data Input	
41	Tx6p	Transmitter Non-Inverted Data output	
42	GND	Ground	1
43	Tx8n	Transmitter Inverted Data Input	
44	Tx8p	Transmitter Non-Inverted Data output	
45	GND	Ground	1
46	Reserved	For future use	3
47	VS1	Module Vendor Specific 1	3
48	VccRx1	3.3V Power Supply	2

49	VS2	Module Vendor Specific 2	3
50	VS3	Module Vendor Specific 3	3
51	GND	Ground	
52	Rx7p	Receiver Non-Inverted Data Output	
53	Rx7n	Receiver Inverted Data Output	
54	GND	Ground	1
55	Rx5p	Receiver Non-Inverted Data Output	
56	Rx5n	Receiver Inverted Data Output	
57	GND	Ground	1
58	GND	Ground	1
59	Rx6n	Receiver Inverted Data Output	
60	Rx6p	Receiver Non-Inverted Data Output	
61	GND	Ground	1
62	Rx8n	Receiver Inverted Data Output	1
63	Rx8p	Receiver Non-Inverted Data Output	
64	GND	Ground	1
65	NC	No Connect	3
66	Reserved	For future use	3
67	VccTx1	3.3V power supply	2
68	Vcc2	3.3V power supply	2
69	Reserved	For Future Use	3
70	GND	Ground	1
71	Tx7p	Transmitter Non-Inverted Data Input	
72	Tx7n	Transmitter Inverted Data Output	
73	GND	Ground	1
74	Tx5p	Transmitter Non-Inverted Data Input	
75	Tx5n	Transmitter Inverted Data Output	
76	GND	Ground	1

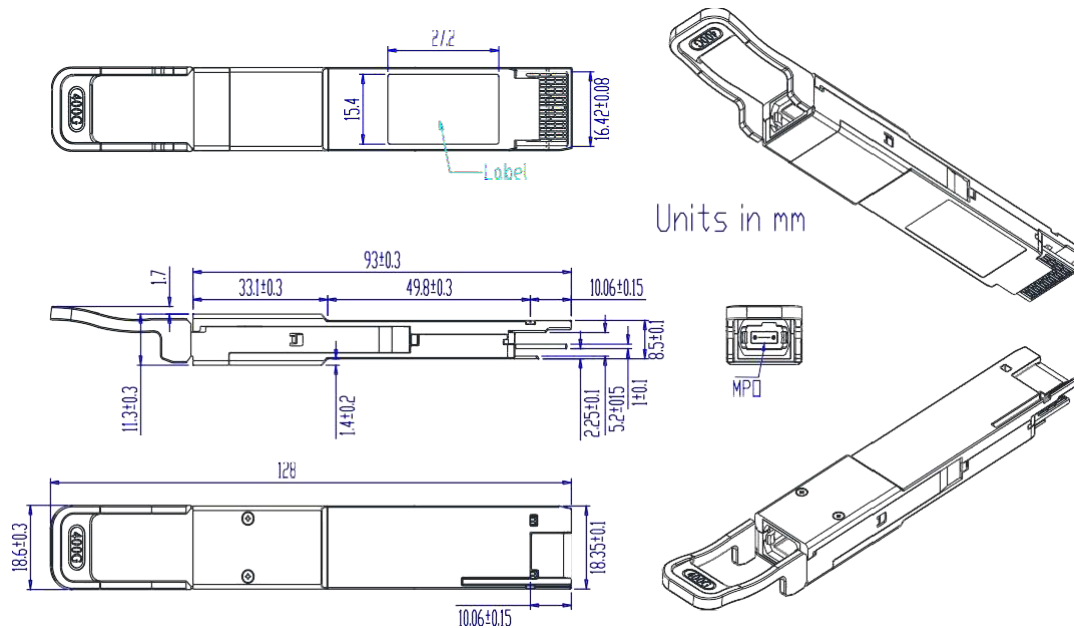
**Notes:**

1. QSFP-DD uses common ground (GND) for all signals and supply (power). All are common within the QSFP-DD module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. VccRx, VccRx1, Vcc1, Vcc2, VccTx and VccTx1 shall be applied concurrently. Requirements defined for the host side of the Host Card Edge Connector are listed in Table 6. VccRx, VccRx1, Vcc1, Vcc2, VccTx and VccTx1 may be internally connected within the module in any combination. The connector Vcc pins are each rated for a maximum current of 1000 mA.
3. All Vendor Specific, Reserved and No Connect pins may be terminated with 50 ohms to ground on the host. Pad 65 (No Connect) shall be left unconnected within the module. Vendor specific and Reserved pads shall have an impedance to GND that is greater than 10 kOhms and less than 100 pF .

## V. Host - Transceiver Interface Block Diagram



## VI. Outline Dimensions



## Appendix A. Document Revision

Version No.	Date	Description
1.0	2019-01-07	Preliminary datasheet
2.0	2020-06-21	Add the drawing of housing dimension
3.0	2020-10-19	Update Power dissipation form 9W to 10W
3.1	2023-07-12	Add the new E-temp PN QD85PC8-02D(E); Update datasheet