

QD400-QD400DAC-xM

400GBase QSFP-DD Direct Attach Cable

Copper, Passive, 0.5m to 3m Lengths, Commercial Temperature

FEATURES

- QSFP-DD Module compliant to QSFP-DD MSA
- Transmission data rate up to 53.125Gbps per channel
- Enables 400Gb/s Transmission Link length up to 3m
- Built-in EEPROM functions
- Operating case temperature 0°C to +70°C
- RoHS2.0 compliant

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	Vcc	3.13	3.3	3.47	V
Storage temperature	Ts	-40	-	85	°C
Operating Case temperature	Tc	0	-	70	°C
Humidity	Rh	5		85	%
Data Rate	-	-	400	-	Gbps

PHYSICAL CHARACTERISTICS

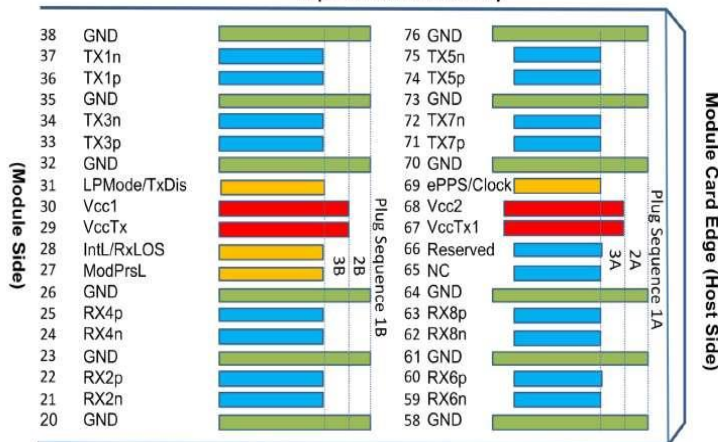
Parameter	Symbol	Min.	Typical	Max.	Unit
Length	L	0.5		3.0	M
AWG		30		27	AWG
Jacket material		PVC, Black (or Customization)			

ELECTRICAL CHARACTERISTICS

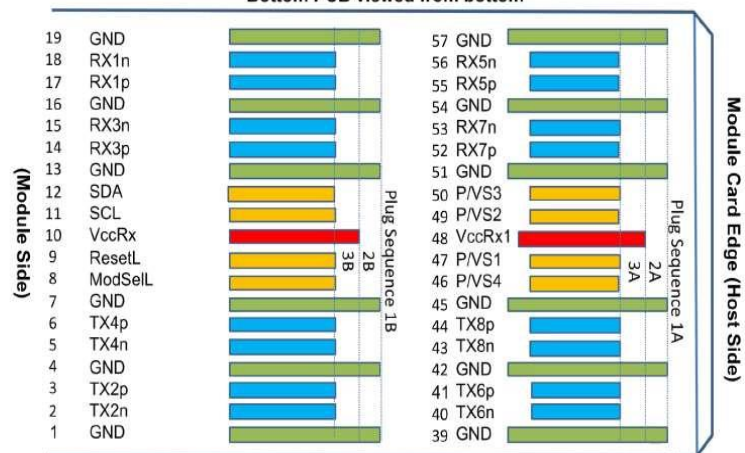
Parameter	Symbol	Min.	Typical	Max.	Unit
Resistance	Rcon	-	-	3	ohm
Insulation Resistance	Rins	-	-	10	Mohm
Raw cable impedance	Zca	95	100	110	ohm
Mated connector Impedance	Zmated	85	100	110	ohm
Insertion loss at 13.28GHz	SDD21	8		17.16	dB
Return loss	SDD11/22	$\text{Return_loss}(f) \geq \begin{cases} 16.5-2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$			dB
Differential to common-mode return loss	SCD11/22	$\text{Return_loss}(f) \geq \begin{cases} 22-(20/25.78)f & 0.01 \leq f < 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$			dB
Differential to common-mode conversion loss	SCD21-SDD21	$\text{Conversion_loss}(f) - IL(f) \geq \begin{cases} 10 & 0.01 \leq f < 12.89 \\ 27-(29/22)f & 12.89 \leq f < 15.7 \\ 6.3 & 15.7 \leq f \leq 19 \end{cases}$			dB
Minimum COM	COM	3			dB

PIN ASSIGNMENT

Top PCB viewed from top



Bottom PCB viewed from bottom



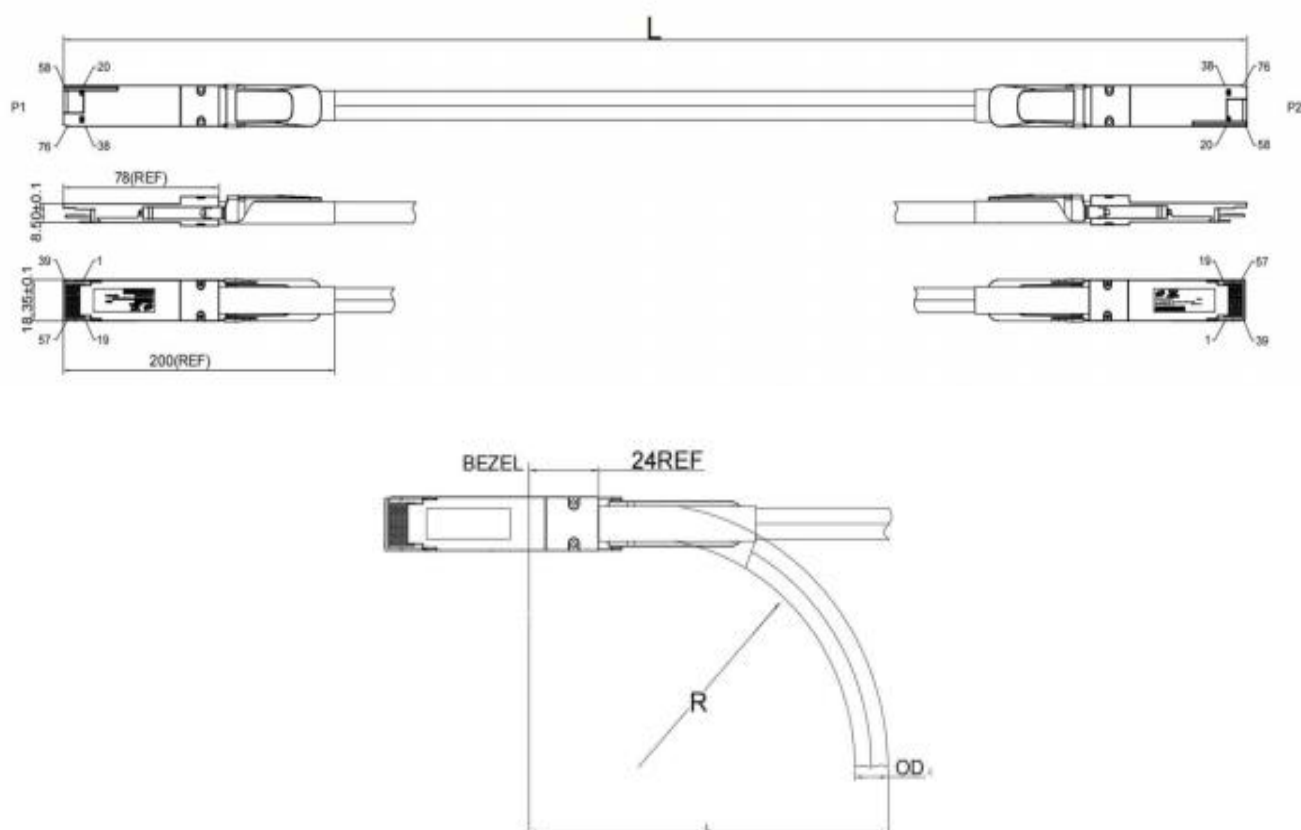
Pin	Logic	Symbol	Definition	Pin	Logic	Symbol	Definition
1		GND	Ground	39		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input	40	CML-I	Tx6n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-inverted Data Input	41	CML-I	Tx6p	Transmitter Non-inverted Data Input
4		GND	Ground	42		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input	43	CML-I	Tx8n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-inverted Data Input	44	CML-I	Tx8p	Transmitter Non-inverted Data Input
7		GND	Ground	45		GND	Ground
8	LVTTL-I	ModSelL	Module Select	46	LVCMO S/CML-I	P/VS4	Programmable/Module Vendor Specific 4
9	LVTTL-I	ResetL	Module Reset	47	LVCMO S/CML-I	P/VS1	Programmable/Module Vendor Specific 1
10		VccRx	+3.3V Power Supply Receiver	48		VccRx1	3.3V Power Supply
11	LVCMO S-I/O	SCL	TWI serial interface clock	49	LVCMO S/CML-O	P/VS2	Programmable/Module Vendor Specific 2
12	LVCMO S-I/O	SDA	TWI serial interface data	50	LVCMO S/CML-O	P/VS3	Programmable/Module Vendor Specific 3
13		GND	Ground	51		GND	Ground
14	CML-O	Rx3p	Receiver Non-inverted Data Output	52	CML-O	Rx7p	Receiver Non-inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output	53	CML-O	Rx7n	Receiver Inverted Data Output
16		GND	Ground	54		GND	Ground
17	CML-O	Rx1p	Receiver Non-inverted Data Output	55	CML-O	Rx5p	Receiver Non-inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data Output	56	CML-O	Rx5n	Receiver Inverted Data Output
19		GND	Ground	57		GND	Ground
20		GND	Ground	58		GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output	59	CML-O	Rx6n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-inverted Data Output	60	CML-O	Rx6p	Receiver Non-inverted Data Output
23		GND	Ground	61		GND	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output	62	CML-O	Rx8n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-inverted Data Output	63	CML-O	Rx8p	Receiver Non-inverted Data Output
26		GND	Ground	64		GND	Ground
27	LVTTL-O	ModPrsL	Module Present	65		NC	Not connected
28	LVTTL-O	IntL/RxLOS	Interrupt/optional RxLOS	66		Reserved	

CONTINUED

29		VccTx	+3.3V Power Supply Transmitter	67		VccTx1	3.3V Power Supply
30		Vcc1	+3.3V Power Supply	68		Vcc2	3.3V Power Supply
31	LVTTL-I	LPMode/TxDis	Low Power mode/optional TX Disable	69	LVCMO S-I	ePPS/Clock	1PPS PTP clock or reference clock input
32		GND	Ground	70		GND	Ground
33	CML-I	Tx3p	Transmitter Non-inverted Data Input	71	CML-I	Tx7p	Transmitter Non-inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input	72	CML-I	Tx7n	Transmitter Inverted Data Input
35		GND	Ground	73		GND	Ground
36	CML-I	Tx1p	Transmitter Non-inverted Data Input	74	CML-I	Tx5p	Transmitter Non-inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input	75	CML-I	Tx5n	Transmitter Inverted Data Input
38		GND	Ground	76		GND	Ground

Pin Definitions

MECHANICAL DIMENSIONS (UNITS: mm)



Gauge	OD	Bend Radius "R"	MIN. Bend Radius "L"
30AWG	14MM	70MM	170MM
27AWG	17.6MM	88MM	190MM

WARNINGS

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Class 1 Laser Product. Complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.