

### **QDD-400G-DAC-2P5M-C**

Juniper Networks® QDD-400G-DAC-2P5M Compatible 400GBase-CU QSFP-DD to QSFP-DD Direct Attach Cable (Passive Twinax, 2.5m)

#### **Features:**

- Compliant to QSFP-DD MSA Standards
- Compliant to IEEE802.3bs
- Operating Temperature: 0 to 70 Celsius
- Hot-Pluggable
- Built-In EEPROM Functions
- RoHS Compliant and Lead-Free



#### **Applications:**

- 400GBase Ethernet

#### **Product Description**

This is a Juniper Networks® Compatible 400GBase-CU QSFP-DD to QSFP-DD direct attach cable that operates over passive copper with a maximum reach of 2.5m. It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. We stand behind the quality of our products and proudly offer a limited lifetime warranty. This cable is TAA (Trade Agreements Act) compliant and is built to comply with MSA (Multi-Source Agreement) standards.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	-0.3	3.3	3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Humidity	RH	5		85	%	
Data Rate			400		Gbps	

## Pin Descriptions

Pin	Logic	Symbol	Name/Description	Plug Sequence
1		GND	Module Ground.	1B
2	CML-I	Tx2-	Transmitter Inverted Data Input.	3B
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	3B
4		GND	Module Ground.	1B
5	CML-I	Tx4-	Transmitter Inverted Data Input.	3B
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	3B
7		GND	Module Ground.	1B
8	LVTTL-I	ModSelL	Module Select.	3B
9	LVTTL-I	ResetL	Module Reset.	3B
10		VccRx	+3.3V Receiver Power Supply.	2B
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	3B
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data.	3B
13		GND	Module Ground.	1B
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	3B
15	CML-O	Rx3-	Receiver Inverted Data Output.	3B
16		GND	Module Ground.	1B
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	3B
18	CML-O	Rx1-	Receiver Inverted Data Output.	3B
19		GND	Module Ground.	1B
20		GND	Module Ground.	1B
21	CML-O	Rx2-	Receiver Inverted Data Output.	3B
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	3B
23		GND	Module Ground.	1B
24	CML-O	Rx4-	Receiver Inverted Data Output.	3B
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	3B
26		GND	Module Ground.	1B
27	LVTTL-O	ModPrsL	Module Present.	3B
28	LVTTL-O	IntL	Interrupt.	3B
29		VccTx	+3.3V Transmitter Power Supply.	2B
30		Vcc1	+3.3V Power Supply.	2B

31	LVTTL-I	InitMode	Initialization Mode. In legacy QSFP applications, the InitMode pad is called LPMode.	3B
32		GND	Module Ground.	1B
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	3B
34	CML-I	Tx3-	Transmitter Inverted Data Input.	3B
35		GND	Module Ground.	1B
36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	3B
37	CML-I	Tx1-	Transmitter Inverted Data Input.	3B
38		GND	Module Ground.	1B
39		GND	Module Ground.	1A
40	CML-I	Tx6-	Transmitter Inverted Data Input.	3A
41	CML-I	Tx6+	Transmitter Non-Inverted Data Input.	3A
42		GND	Module Ground.	1A
43	CML-I	Tx8-	Transmitter Inverted Data Input.	3A
44	CML-I	Tx8+	Transmitter Non-Inverted Data Input.	3A
45		GND	Module Ground.	1A
46		OPEN		3A
47		OPEN		3A
48		OPEN		2A
49		OPEN		3A
50		OPEN		3A
51		GND		1A
52	CML-O	Rx7+	Receiver Non-Inverted Data Output.	3A
53	CML-O	Rx7-	Receiver Inverted Data Output.	3A
54		GND	Module Ground.	1A
55	CML-O	Rx5+	Receiver Non-Inverted Data Output.	3A
56	CML-O	Rx5-	Receiver Inverted Data Output.	3A
57		GND	Module Ground.	1A
58		GND	Module Ground.	1A
59	CML-O	Rx6-	Receiver Inverted Data Output.	3A
60	CML-O	Rx6+	Receiver Non-Inverted Data Output.	3A
61		GND	Module Ground.	1A
62	CML-O	Rx8-	Receiver Inverted Data Output.	3A
63	CML-O	Rx8+	Receiver Non-Inverted Data Output.	3A
64		GND	Module Ground.	1A
65		OPEN	Not Connected.	3A
66		OPEN	For Future Use.	3A
67		OPEN	+3.3V Transmitter Power Supply.	2A
68		OPEN	+3.3V Power Supply.	2A
69		OPEN	For Future Use.	3A
70		GND	Module Ground.	1A
71	CML-I	Tx7+	Transmitter Non-Inverted Data Input.	3A
72	CML-I	Tx7-	Transmitter Inverted Data Input.	3A
73		GND	Module Ground.	1A

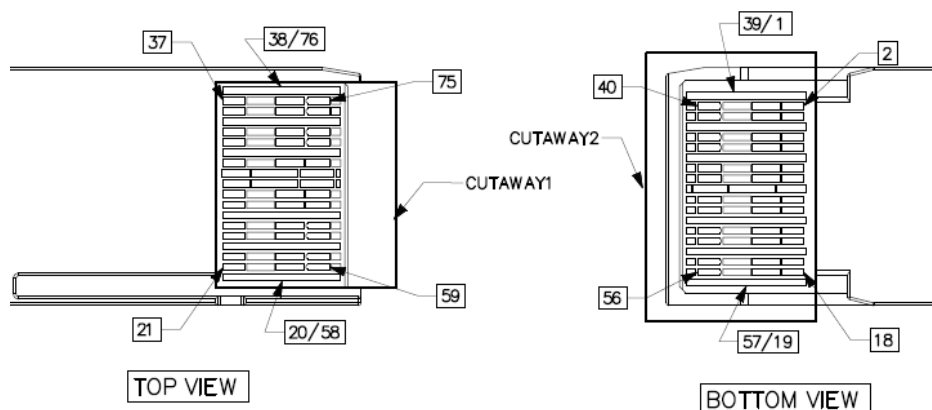
74	CML-I	Tx5+	Transmitter Non-Inverted Data Input.	3A
75	CML-I	Tx5-	Transmitter Inverted Data Input.	3A
76		GND	Module Ground.	1A

## Wiring Diagram

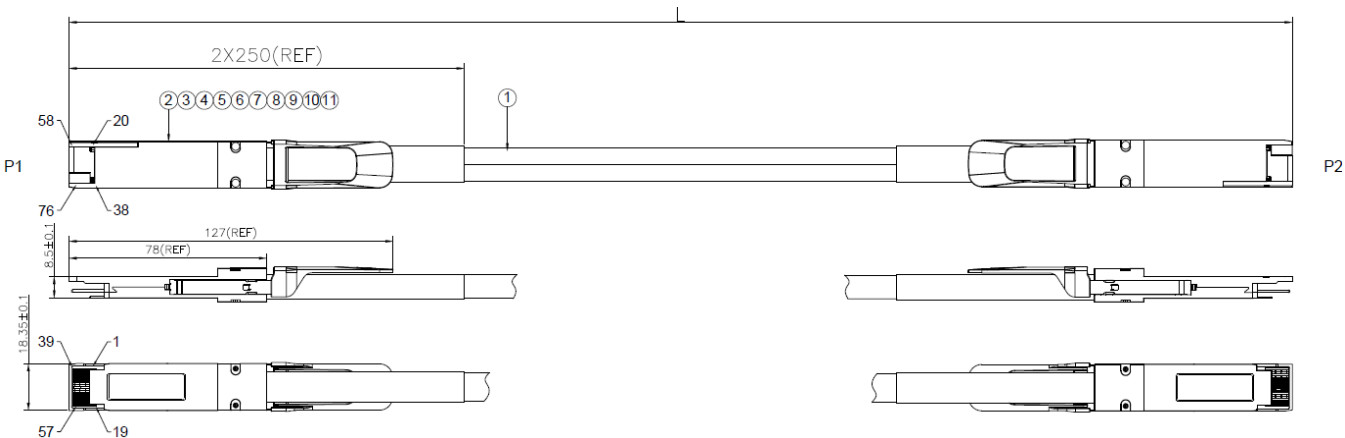
LOW SPEED SIGNALS P1 & P2	
PAD	SIGNAL
8	MODESEL
9	RESETL
10	VCCRFX
11	SCL
12	SDA
27	MODPRSL
28	INTL
29	VCCTX
30	VCC1
31	INIT_MODE
46	OPEN
47	OPEN
48	OPEN
49	OPEN
50	OPEN
65	OPEN
66	OPEN
67	OPEN
68	OPEN
69	OPEN

WIRING DIAGRAM					
P1 END			P2 END		
Pad	Signal		Pad	Signal	
1	GND	—	20	GND	
2	TX2n	→	21	RX2n	
3	TX2p	→	22	RX2p	
4	GND	—	23	GND	
5	TX4n	→	24	RX4n	
6	TX4p	→	25	RX4p	
7	GND	—	26	GND	
13	GND	—	32	GND	
14	RX3p	←	33	TX3p	
15	RX3n	←	34	TX3n	
16	GND	—	35	GND	
17	RX1p	←	36	TX1p	
18	RX1n	←	37	TX1n	
19	GND	—	38	GND	
20	GND	—	1	GND	
21	RX2n	←	2	TX2n	
22	RX2p	←	3	TX2p	
23	GND	—	4	GND	
24	RX4n	←	5	TX4n	
25	RX4p	←	6	TX4p	
26	GND	—	7	GND	
32	GND	—	13	GND	
33	TX3p	→	14	RX3p	
34	TX3n	→	15	RX3n	
35	GND	—	16	GND	
36	TX1p	→	17	RX1p	
37	TX1n	→	18	RX1n	
38	GND	—	19	GND	

WIRING DIAGRAM					
P1 END			P2 END		
Pad	Signal		Pad	Signal	
39	GND	—	58	GND	
40	TX6n	→	59	RX6n	
41	TX6p	→	60	RX6p	
42	GND	—	61	GND	
43	TX8n	→	62	RX8n	
44	TX8p	→	63	RX8p	
45	GND	—	64	GND	
51	GND	—	70	GND	
52	RX7p	←	71	TX7p	
53	RX7n	←	72	TX7n	
54	GND	—	73	GND	
55	RX5p	←	74	TX5p	
56	RX5n	←	75	TX5n	
57	GND	—	76	GND	
58	GND	—	39	GND	
59	RX6n	←	40	TX6n	
60	RX6p	←	41	TX6p	
61	GND	—	42	GND	
62	RX8n	←	43	TX8n	
63	RX8p	←	44	TX8p	
64	GND	—	45	GND	
70	GND	—	51	GND	
71	TX7p	→	52	RX7p	
72	TX7n	→	53	RX7n	
73	GND	—	54	GND	
74	TX5p	→	55	RX5p	
75	TX5n	→	56	RX5n	
76	GND	—	57	GND	



# Mechanical Specifications



Item	Name	Description	Quantity
1	Raw Cable	9 Pairs, PVC Jacket, Black	A/R
2	PCBA	PCB, 76P, Au 30u" Minimum	2
3	Top Shell	Zinc Alloy, Plated Nickel Over Copper	2
4	Bottom Shell	Zinc Alloy, Plated Nickel Over Copper	2
5	Pull Tab	Pull Tab, TPV, Black	2
6	Rivet	Aluminum Alloy	4
7	Spring	Stainless Steel	4
8	Blackshell Label	Blackshell Label	2
9	Inner Mold	Hot-Melt Glue	A/R
10	Copper Tape	T=0.15MM	A/R
11	Heat Shrinkable Tube	Black Tube	A/R

## Notes:

1. Raw cable impedance:  $100^{+10}_{-5}\Omega$ . Mated connector impedance:  $100^{+10}_{-15}\Omega$ . Rise time: 25ps (20-80%).
2. 100% conductor test. Test condition: voltage 5V. Insulation resistance: 10m $\Omega$ . Conduction resistance maximum: 3 $\Omega$ .
3. High-frequency test according to IEEE802.3cd standard.
4. All materials are RoHS complaint.

## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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