

## QSFP28-4SFP28-PDACXM-C

MSA and TAA Compliant 100GBase-CU QSFP28 to 4xSFP28 Direct Attach Cable (Passive Twinax, Up to 3m)

### Features

- Supporting 100 Gbps to 4 x 25 Gbps
- Support data rates: 25.78Gb/s (per channel)
- IEEE 802.3bj 100GEBASE-CR4 and P802.3 by compliant
- Compatible to SFP28 MSA and QSFP28 MSA
- Compatible to SFF-8402, SFF-8432 and SFF-8665
- Maximum aggregate data rate: 100 GB/s (4 x 25GB/s)
- High-Density QSFP28 38-PIN and 4x SFP28 20-PIN Connector
- Temperature Range: 0~ 70 °C
- Copper link length up to 3m
- Power Supply: +3.3V
- Low crosstalk
- I2C based 2-wire serial interface
- Operating Temperature: 0~ 70 °C
- ROHS Compliant



### Applications

- 100GE/25 Gigabit Ethernet
- Switches, Routers, and HBAs
- Data Centers

### Product Description

This is an MSA compliant 100GBase-CU QSFP28 to 4xSFP28 direct attach cable that operates over passive copper with a maximum reach up to 3m (9.8ft). It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This direct attach cable is TAA (Trade Agreements Act) compliant, and is built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLab's direct attach cables 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."



## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Storage Ambient Temperature		-40		+85	°C
Operating Case Temperature	TC	0		+70	°C
Power Supply Voltage	V <sub>cc3</sub>	3.14	3.3	3.47	V

## High Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	<i>RIN, P-P</i>	90	100	110	Ω	
Insertion Loss	<i>SDD21</i>	8		22.48	dB	At 12.8906 Ghz
Differential Return Loss	<i>SDD11</i> <i>SDD22</i>	12.45		See 1	dB	At 0.05 to 4.1 GHz
		3.12		See 2		
Common-mode to common-mode output return loss	<i>SCC11</i> <i>SCC22</i>	2			dB	At 0.2 to 19 GHz
Differential to Common Mode Return Loss	<i>SCD11</i> <i>SCD22</i>	12		See 3	dB	At 0.01 to 12.89 GHz
		10.58		See 4		At 12.89 to 19 GHz
Differential to Common Mode Conversion Loss	<i>SCD21-IL</i>	10			dB	At 0.01 to 12.89 GHz
				See 5		At 12.89 to 15.7 GHz
		6.3				At 15.7 to 19 GHz
Channel Operating Margin	<i>COM</i>	3			dB	

### Notes:

1. Reflection Coefficient given by equation  $SDD11 \text{ (dB)} < 16.5 - 2 \times \text{SQRT}(f)$ , with f in GHz
2. Reflection Coefficient given by equation  $SDD11 \text{ (dB)} < 10.66 - 14 \times \log_{10}(f/5.5)$ , with f in GHz
3. Reflection Coefficient given by equation  $SCD11 \text{ (dB)} < 22 - (20/25.78) \times f$ , with f in GHz
4. Reflection Coefficient given by equation  $SCD11 \text{ (dB)} < 15 - (6/25.78) \times f$ , with f in GHz
5. Reflection Coefficient given by equation  $SCD21 \text{ (dB)} < 27 - (29/22) \times f$ , with f in GHz

## QSFP28 Pin Descriptions

Pin	Logic	Symbol	Name Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTTL-I	ModselL	Module Select	
9	LVTTTL-I	ResetL	Module Reset	
10		Vcc Rx	+3.3V Power Supply Receiver	2
11	LVC MOSI/O	SCL	2-wire serial interface clock	
12	LVC MOSI/O	SDA	2-wire serial interface data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTTL-O	ModPrsL	Module Present	
28	LVTTTL-O	IntL	Interrupt	
29		Vcc Tx	+3.3V Power supply transmitter	2
30		Vcc1	+3.3V Power supply	2
31	LVTTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1

**Notes:**

1. GND is the symbol for signal and supply (power) common for the QSFP28 Module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground lane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in Table 6. Recommended host board power supply filtering is shown in Figure 4. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP28 Module in any combination. The connection pins are each rated for a maximum current of 500 mA.

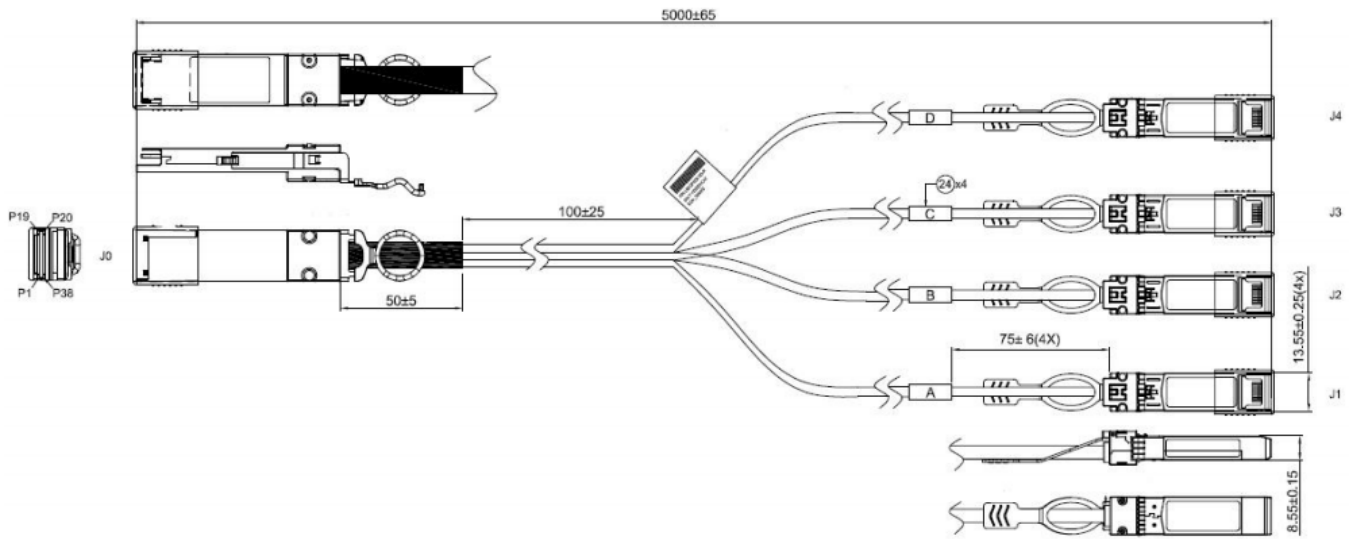
**SFP28 Pin Descriptions**

Pin	Logic	Symbol	Name Description	Notes
1		VeeT	Transmitter Ground	
2	LV-TTL-O	TX_Fault	N/A	1
3	LV-TTL-I	TX_DIS	Transmitter Disable	2
4	LV-TTL-/O	SDA	Tow Wire Serial Data	
5	LV-TTLV-I	SCL	Tow Wire Serial Clock	
6		MOD_DEF0	Module present, connect to VeeT	
7	LV-TTL-I	RS0	N/A	1
8	LV-TTL-O	LOS	LOS of Signal	2
9	LV-TTL-I	RS1	N/A	1
10		VeeR	Receiver Ground	
11		VeeR	Receiver Ground	
12	CML-O	RD-	Receiver Data Inverted	
13	CML-O	RD+	Receiver Data Non-Inverted	
14		VeeR	Receiver Ground	
15		VccR	Receiver Supply 3.3V	
16		VccT	Transmitter Supply 3.3V	
17		VeeT	Transmitter Ground	
18	CML-I	TD+	Transmitter Data Non-Inverted	
19	CML_I	TD-	Transmitter Data Inverted	
20		VeeT	Transmitter Ground	

**Notes:**

1. Signals not supported in SFP28 Copper pulled-down to VeeT with 30K ohms resistor
2. Passive cable assemblies do not support LOS and TX\_DIS

# Mechanical Dimensions



## **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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