

### **QSFP28-100GB-PDAC1MLZ-MX-C**

Mellanox® Compatible TAA 100GBase-CU QSFP28 to QSFP28 Direct Attach Cable (Passive Twinax, 1m, Infiniband EDR, 30AWG, LSZH)

#### **Features:**

- Compliant to SFF-8661
- IEEE802.3bj/IB EDR Standard
- 100Gbps
- 30AWG
- Passive copper
- Operating Temperature 0 to 70 Celsius
- RoHS 2.0 compliant and lead-free



#### **Applications:**

- 100GBase-CU
- Infiniband EDR

#### **Product Description**

This is a Mellanox® Compatible 100GBase-CU QSFP28 to QSFP28 Infiniband EDR LSZH direct attach cable that operates over passive copper with a maximum reach of 1m. 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 |
|----------------------------|--------|------|------|------|------|
| Supply Voltage             | Vcc    | 3.13 | 3.3  | 3.47 | V    |
| Storage Temperature        | Tstg   | -40  |      | 85   | °C   |
| Operating Case Temperature | Tc     | 0    |      | 70   | °C   |
| Humidity                   | RH     | 5    |      | 85   | %    |
| Data Rate                  |        |      | 100  |      | Gbps |

## Physical Characteristics

| Parameter       | Symbol      | Min. | Typ. | Max. | Unit |
|-----------------|-------------|------|------|------|------|
| Length          | L           |      |      | 1    | M    |
| AWG             |             |      |      | 30   | AWG  |
| Jacket Material | LSZH, Black |      |      |      |      |

## Electrical Specifications

| Parameter                                   | Symbol      | Min.                                                                                                                                                                                          | Typ. | Max.  | Unit |
|---------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|
| Resistance                                  | Rcon        |                                                                                                                                                                                               |      | 3     | Ω    |
| Insulation Resistance                       | Rins        |                                                                                                                                                                                               |      | 10    | MΩ   |
| Raw Cable Impedance                         | Zca         | 95                                                                                                                                                                                            | 100  | 110   | Ω    |
| Mated Connector Impedance                   | Zmated      | 85                                                                                                                                                                                            | 100  | 110   | Ω    |
| Insertion Loss at 12.89GHz                  | SDD21       | 8                                                                                                                                                                                             |      | 22.48 | dB   |
| Return Loss at 12.89GHz                     | SDD11/22    | $\text{Return\_Loss}(f) \geq \begin{cases} 16.5 - 2\sqrt{f}, & 0.05 \leq f < 4.1 \\ 10.66 - 14\log_{10}\left(\frac{f}{5.5}\right), & 4.1 \leq f \leq 19 \end{cases}$                          |      |       | dB   |
| Differential to Common-Mode Return Loss     | SCD11/22    | $\text{Return\_Loss}(f) \geq \begin{cases} 22 - \left(\frac{20}{25.78}\right)f, & 0.01 \leq f < 12.89 \\ 15 - \left(\frac{6}{25.78}\right)f, & 12.89 \leq f \leq 19 \end{cases}$              |      |       | dB   |
| Differential to Common-Mode Conversion Loss | SCD21-SDD21 | $\text{Conversion\_Loss}(f) - \text{IL}(f) \geq \begin{cases} 10, & 0.01 \leq f < 12.89 \\ 27 - \left(\frac{29}{22}\right)f, & 12.89 \leq f < 15.7 \\ 6.3, & 15.7 \leq f \leq 19 \end{cases}$ |      |       | dB   |
| Minimum COM                                 | COM         | 3                                                                                                                                                                                             |      |       | dB   |
| Rise Time (20-80%)                          |             |                                                                                                                                                                                               |      | 25    | ps   |

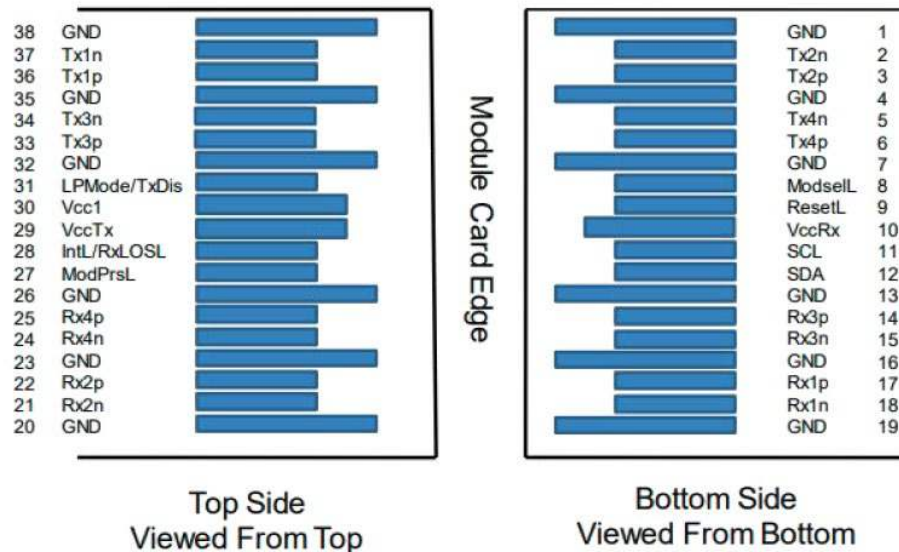
## Pin Descriptions

| Pin | Logic       | Symbol  | Name/Description                                                                               | Plug Sequence | Note |
|-----|-------------|---------|------------------------------------------------------------------------------------------------|---------------|------|
| 1   |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 2   | CML-I       | Tx2-    | Transmitter Inverted Data Input.                                                               | 3             |      |
| 3   | CML-I       | Tx2+    | Transmitter Non-Inverted Data Input.                                                           | 3             |      |
| 4   |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 5   | CML-I       | Tx4-    | Transmitter Inverted Data Input.                                                               | 3             |      |
| 6   | CML-I       | Tx4+    | Transmitter Non-Inverted Data Input.                                                           | 3             |      |
| 7   |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 8   | LVTTL-I     | MODSEIL | Module Select.                                                                                 | 3             |      |
| 9   | LVTTL-I     | ResetL  | Module Reset.                                                                                  | 3             |      |
| 10  |             | VccRx   | +3.3V Receiver Power Supply.                                                                   | 2             | 2    |
| 11  | LVC MOS-I/O | SCL     | 2-Wire Serial Interface Clock.                                                                 | 3             |      |
| 12  | LVC MOS-I/O | SDA     | 2-Wire Serial Interface Data.                                                                  | 3             |      |
| 13  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 14  | CML-O       | Rx3+    | Receiver Non-Inverted Data Output.                                                             | 3             |      |
| 15  | CML-O       | Rx3-    | Receiver Inverted Data Output.                                                                 | 3             |      |
| 16  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 17  | CML-O       | Rx1+    | Receiver Non-Inverted Data Output.                                                             | 3             |      |
| 18  | CML-O       | Rx1-    | Receiver Inverted Data Output.                                                                 | 3             |      |
| 19  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 20  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 21  | CML-O       | Rx2-    | Receiver Inverted Data Output.                                                                 | 3             |      |
| 22  | CML-O       | Rx2+    | Receiver Non-Inverted Data Output.                                                             | 3             |      |
| 23  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 24  | CML-O       | Rx4-    | Receiver Inverted Data Output.                                                                 | 3             |      |
| 25  | CML-O       | Rx4+    | Receiver Non-Inverted Data Output.                                                             | 3             |      |
| 26  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 27  | LVTTL-O     | ModPrsL | Module Present.                                                                                | 3             |      |
| 28  | LVTTL-O     | IntL    | Interrupt. Optionally configurable as RxLOSL via the management interface (SFF-8636).          | 3             |      |
| 29  |             | VccTx   | +3.3V Transmitter Power Supply.                                                                | 2             | 2    |
| 30  |             | Vcc1    | +3.3V Power Supply.                                                                            | 2             | 2    |
| 31  | LVTTL-I     | LPMode  | Low-Power Mode. Optionally configurable as Tx_Disable via the management interface (SFF-8636). | 3             |      |
| 32  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 33  | CML-I       | Tx3+    | Transmitter Non-Inverted Data Input.                                                           | 3             |      |
| 34  | CML-I       | Tx3-    | Transmitter Inverted Data Input.                                                               | 3             |      |
| 35  |             | GND     | Module Ground.                                                                                 | 1             | 1    |
| 36  | CML-I       | Tx1+    | Transmitter Non-Inverted Data Input.                                                           | 3             |      |
| 37  | CML-I       | Tx1-    | Transmitter Inverted Data Input.                                                               | 3             |      |
| 38  |             | GND     | Module Ground.                                                                                 | 1             | 1    |

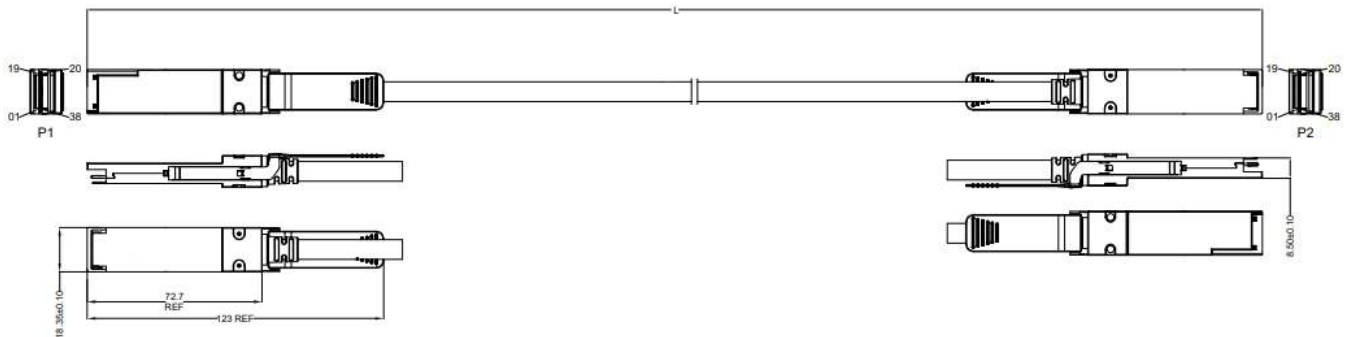
## Notes:

1. GND is the symbol for signal and supply (power) common for the module. All are common within the 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, Vcc1, and VccTx are applied concurrently and may be internally connected within the module in any combination. Vcc contacts in SFF-8662 and SFF-8672 each have a steady state current rating of 1A.

## Electrical Pin-Out Details



## Mechanical Specifications



## Notes:

1. 8 pairs.
2. 100% conductor test conditions: 5V, insulation resistance of 10MΩ, and conduction resistance maximum of 3Ω.

## 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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