

## QSFP28-2QSFP28-PDAC2-5M-AO

MSA and TAA 100GBase-CU QSFP28 to 2xQSFP28 Direct Attach Cable (Passive Twinax, 2.5m)

### Features

- QSFP Module Complaint to SFF-8661
- Enable (4x25.78)100Gbps Transmission
- Transmission Data Rate up to 25.78 Gbps per Channel
- Operating Temperature: 0 to 70 Celcius
- RoHS Complaint and Lead-Free
- Built in EEPROM Functions



### Applications

- 100GBase Ethernet

### Product Description

This is an MSA compliant 100GBase-CU QSFP28 to 2xQSFP28 direct attach cable that operates over passive copper with a maximum reach of 2.5m (8.2ft). 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.

AddOn's 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."



## General Specifications

| Parameter             | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------|--------|------|------|------|------|
| Supply Voltage        | Vcc    | 3.13 | 3.3  | 3.47 | V    |
| Storage Temperature   | Tstg   | -40  |      | 85   | °C   |
| Operating Temperature | Tc     | 0    |      | 70   | °C   |
| Relative Humidity     | RH     | 5    |      | 85   | %    |
| Data Rate             |        |      | 100  |      | Gbps |

## Electrical Specifications

| Parameter                                   | Symbol      | Min.                           | Typ.   | Max.  | Unit |
|---|-------------|--------------------------------|--|-------|------|
| Resistance                                  | Rcon        |                                |  | 3     | Ω    |
| Insulation Resistance                       | Rins        |                                |  | 10    | MΩ   |
| Raw Cable Impedance                         | Zca         | 95                             | 100  | 105   | Ω    |
| Mated Connector Impedance                   | Zmated      | 85                             | 100  | 115   | Ω    |
| Insertions Loss at 12.89 GHz                | SDD21       | 8                              |  | 22.48 | dB   |
| Return Loss at 12.89GHz                     | SDD11/22    | Return_Loss(f)≥                | $\left\{ \begin{array}{ll} 16.5-2\sqrt{f} & 0.5 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{array} \right\}$        |       | dB   |
| Differential to Common-Mode Return Loss     | SCD11/22    | Return_Loss(f)≥                | $\left\{ \begin{array}{ll} 22-(20/25.78)f & 0.01 \leq f \leq 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{array} \right\}$           |       | dB   |
| Differential to Common-Mode Conversion Loss | SCD21-SDD21 | Conversion_Loss(f)≥<br>-IL(f)≥ | $\left\{ \begin{array}{ll} 10 & 0.01 \leq f < 12.89 \\ 27-(29/22)f & 0.01 \leq f < 15.7 \\ 6.3 & 15.7 \leq f \leq 19 \end{array} \right\}$ |       | dB   |
| Minimum COM                                 | COM         | 3                              |  |       | dB   |

## Pin Descriptions

| Pin | Logic      | Symbol  | Name/Descriptions                                       | Plug Sequence | Ref. |
|-----|------------|---------|---|---------------|------|
| 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   | LVTTTL-I   | MODSEIL | Module Select.  | 3             | 2    |
| 9   | LVTTTL-I   | ResetL  | Module Reset.   | 3             | 2    |
| 10  |            | VccRx   | +3.3V Receiver Power Supply.                            | 2             |      |
| 11  | LVCNOS-I/O | SCL     | 2-Wire Serial Interface Clock.                          | 3             | 2    |
| 12  | LVCNOS-I/O | SDA     | 2-Wire Serial Interface Data.                           | 3             | 2    |
| 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.  | 3             | 1    |
| 21  | CML-O      | Rx2-    | Receiver Inverted Data Output.                          | 3             |      |
| 22  | CML-O      | Rx2+    | Receiver Non-Inverted Data Output.                      | 1             |      |
| 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  | LVTTTL-O   | ModPrsL | Module Present. Internally pulled down to the GND.      | 3             |      |
| 28  | LVTTTL-O   | IntL    | Interrupt output should be pulled up on the host board. | 3             | 2    |
| 29  |            | VccTx   | +3.3V Transmitter Power Supply.                         | 2             |      |
| 30  |            | Vcc1    | +3.3V Power Supply.                                     | 2             |      |
| 31  | LVTTTL-I   | LPMode  | Low-Power Mode.   | 3             | 2    |
| 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    |

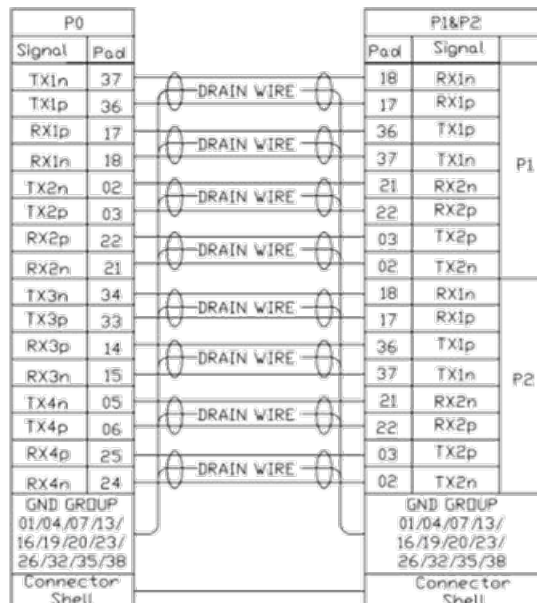
**Notes:**

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are references to this potential unless otherwise noted. Connect the directly to the host board signal-common ground plane.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host board power supply filtering is shown in host board figure. VccRx, Vcc1, and VccTx may be internally connected within the QSFP+ module in any combination. The connector pins are each for a maximum current of 500mA.

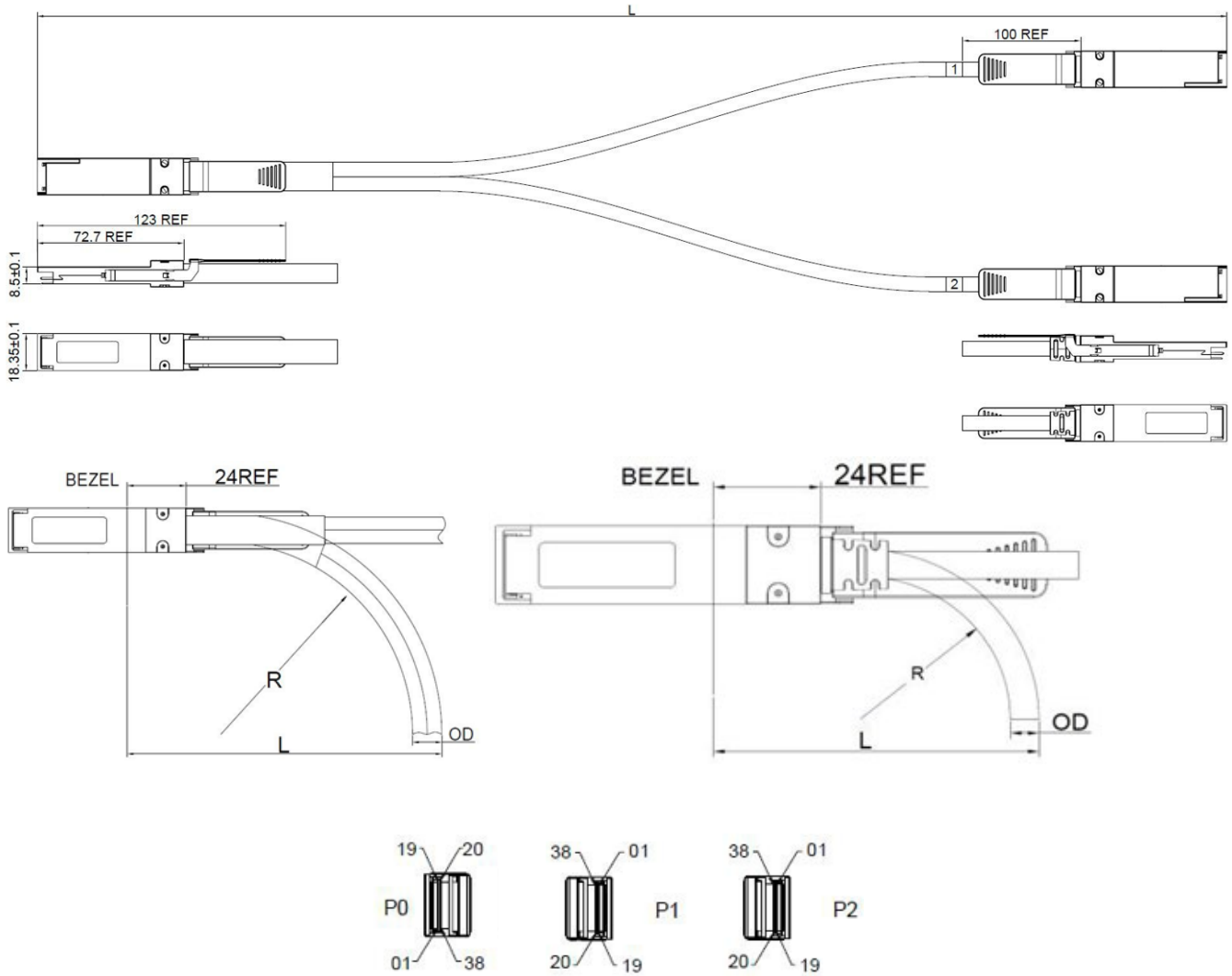
**Electrical Pin-out Details**



**Wire Diagram**



## Mechanical Specifications



## Cable Specifications

| Parameter           | Symbol  | Min.                          | Typ. | Max. | Unit |
|---------------------|---------|-------------------------------|------|------|------|
| Length              | L       | 0.5                           |      | 5.0  | M    |
| AWG                 |         |                               | 30   |      | AWG  |
| Jacket Material     |         | PVC, Black (or Customization) |      |      |      |
| OD                  | P0      |                               | 12MM |      |      |
|                     | P1 & P2 |                               | 6MM  |      |      |
| Bend Radius         | P0      | R                             | 60MM |      |      |
|                     | P1 & P2 |                               | 30MM |      |      |
| Minimum Bend Radius | P0      | L                             | 96MM |      |      |
|                     | P1 & P2 |                               | 60MM |      |      |

## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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