



### **QSFPDD-400G-PDAC1-5M-J-OPC**

Juniper Networks® Compatible TAA 400GBase-CU QSFPDD Direct Attach Cable (Passive Twinax, 1.5m)

#### **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 an Juniper Networks® compatible 400GBase-CU QSFP-DD to QSFP-DD direct attach cable that operates over passive copper with a maximum reach of 1.5m (4.9ft). 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.

OptioConnect's transceivers are RoHS compliant and lead-free.

## 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 |

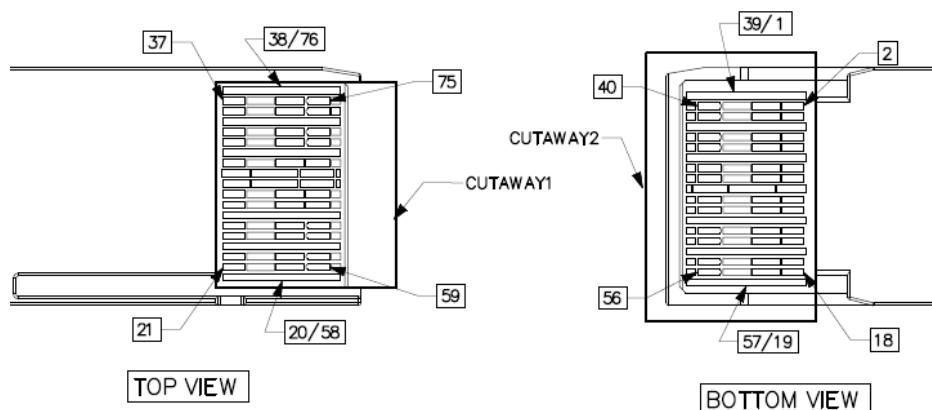
|    |       |      |                                      |    |
|----|-------|------|--------------------------------------|----|
| 74 | CML-I | Tx5+ | Transmitter Non-Inverted Data Input. | 3A |
| 75 | CML-I | Tx5- | Transmitter Inverted Data Input.     | 3A |
| 76 |       | GND  | Module Ground.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

## Wiring Diagram

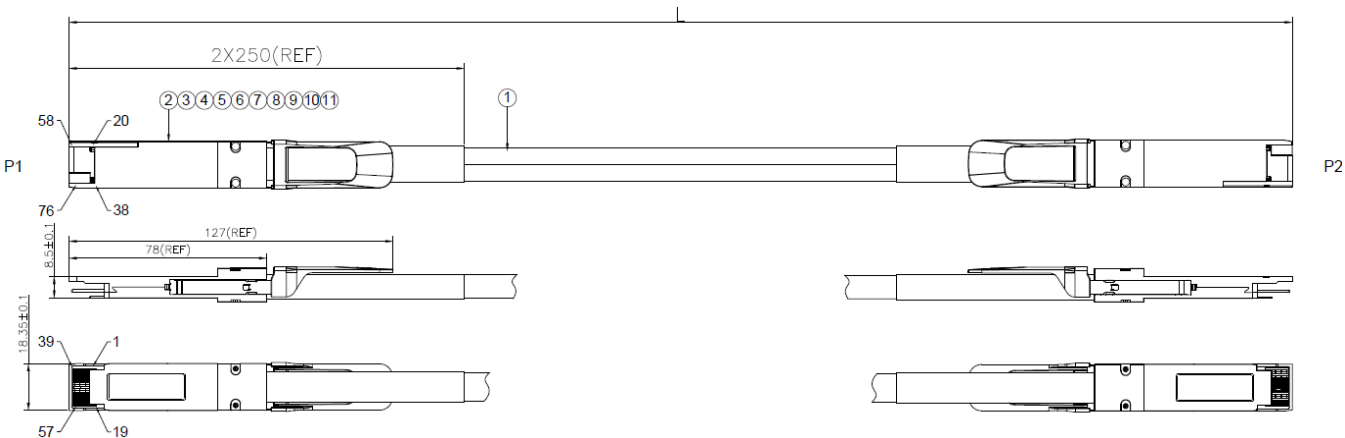
| LOW SPEED SIGNALS<br>P1 & P2 |           |
|------------------------------|-----------|
| PAD                          | SIGNAL    |
| 8                            | MODESEL   |
| 9                            | RESETL    |
| 10                           | VCCR_X    |
| 11                           | 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.

## **OptioConnect**

### **Innovation for the Future of High-Speed Networking**

#### **Who We Are**

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

#### **What We Do**

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

#### **Smarter Networks by Design**

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

#### **Our Team**

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

#### **Our Mission**

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

#### **Let's Connect**

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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