

## **QDD-400-CU2-5M-AO**

Cisco® QDD-400-CU2-5M Compatible TAA Compliant 400GBase-CU QSFP-DD to QSFP-DD PAM-4 Direct Attach Cable (Passive Twinax, 2.5m)

### **Features**

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



### **Applications**

- 400GBase Ethernet

### **Product Description**

This is a Cisco® QDD-400-CU2-5M compatible TAA compliant 400GBase-CU QSFP-DD to QSFP-DD PAM-4 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.")



## 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 |       |
| Wire Gauge                 |        |      | 28   |      | AWG  |       |

## 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

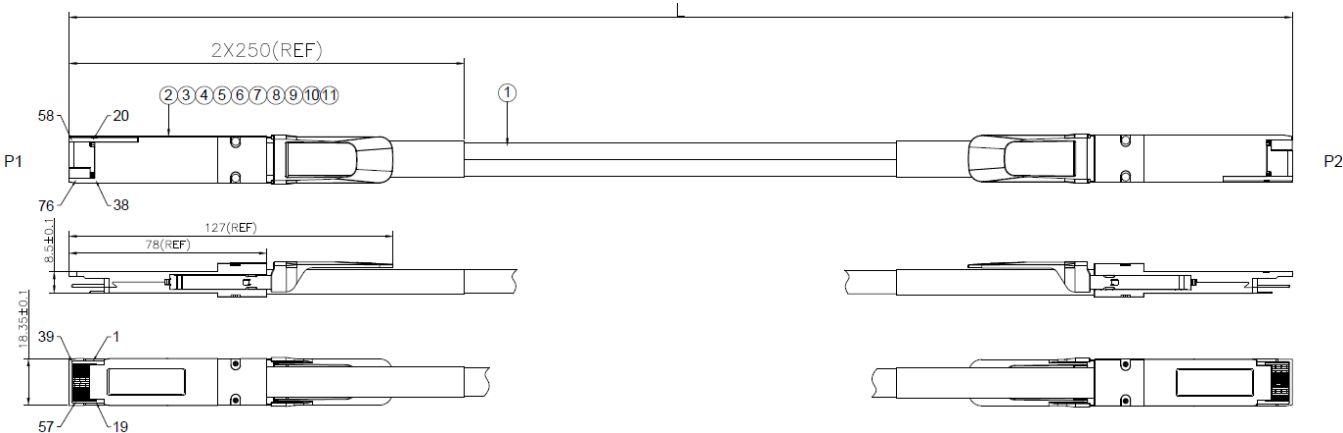
| LOW SPEED SIGNALS<br>P1 & P2 |           |
|------------------------------|-----------|
| PAD                          | SIGNAL    |
| 8                            | MODSELL   |
| 9                            | RESETL    |
| 10                           | VCCRX     |
| 11                           | 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            | 8 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 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 from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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