

### **QDD-400GB-AEC-1-5M-MX-C**

Mellanox® Compatible TAA 400GBase-AEC QSFP-DD to QSFP-DD Active Electrical Cable (AEC, 1.5m, CMIS 5.2)

#### **Features:**

- Compliant with QSFP-DD MSA and CMIS 5.2
- Supports 8x56G PAM4 Electrical Data Rates
- Enables 400Gbps Transmission
- Wire Gauge: 30AWG
- Typical Power Consumption: 7.5W Per End
- Single 3.3V Power Supply
- Operating Temperature Range: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### **Applications:**

- 400GBase Ethernet

#### **Product Description**

This is a Mellanox® compatible 400GBase-AEC QSFP-DD to QSFP-DD active electrical cable that operates over active 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 active electrical 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.

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.")



## General Specifications

| Parameter                       | Symbol | Min.  | Typ. | Max.  | Unit | Notes |
|---------------------------------|--------|-------|------|-------|------|-------|
| Storage Temperature             | Tstg   | -40   |      | 80    | °C   |       |
| Operating Case Temperature      | Tc     | 0     |      | 70    | °C   |       |
| Power Supply Not Damage Voltage | V      | -0.5  |      | 3.6   |      |       |
| Relative Operating Humidity     | RH     | 0     |      | 85    | %    |       |
| Power Supply Working Voltage    | V      | 3.135 | 3.3  | 3.465 |      |       |
| Bit Rate                        | Gbps   |       | 400  |       |      |       |

## Pin Descriptions

| Pin | Symbol       | Logic       | Name/Description                                                                    | Notes |
|-----|--------------|-------------|-------------------------------------------------------------------------------------|-------|
| 1   | GND          |             | Module Ground.                                                                      |       |
| 2   | Tx2-         | CML-I       | Transmitter Inverted Data Input.                                                    |       |
| 3   | Tx2+         | CML-I       | Transmitter Non-Inverted Data Input.                                                |       |
| 4   | GND          |             | Module Ground.                                                                      |       |
| 5   | Tx4-         | CML-I       | Transmitter Inverted Data Input.                                                    |       |
| 6   | Tx4+         | CML-I       | Transmitter Non-Inverted Data Input.                                                |       |
| 7   | GND          |             | Module Ground.                                                                      |       |
| 8   | ModSelL      | LVTTL-I     | Module Select.                                                                      |       |
| 9   | ResetL       | LVTTL-I     | Module Reset.                                                                       |       |
| 10  | VccRx        |             | +3.3V Receiver Power Supply.                                                        |       |
| 11  | SCL          | LVC MOS-I/O | 2-Wire Serial Interface Clock.                                                      |       |
| 12  | SDA          | LVC MOS-I/O | 2-Wire Serial Interface Data.                                                       |       |
| 13  | GND          |             | Module Ground.                                                                      |       |
| 14  | Rx3+         | CML-O       | Receiver Non-Inverted Data Output.                                                  |       |
| 15  | Rx3-         | CML-O       | Receiver Inverted Data Output.                                                      |       |
| 16  | GND          |             | Module Ground.                                                                      |       |
| 17  | Rx1+         | CML-O       | Receiver Non-Inverted Data Output.                                                  |       |
| 18  | Rx1-         | CML-O       | Receiver Inverted Data Output.                                                      |       |
| 19  | GND          |             | Module Ground.                                                                      |       |
| 20  | GND          |             | Module Ground.                                                                      |       |
| 21  | Rx2-         | CML-O       | Receiver Inverted Data Output.                                                      |       |
| 22  | Rx2+         | CML-O       | Receiver Non-Inverted Data Output.                                                  |       |
| 23  | GND          |             | Module Ground.                                                                      |       |
| 24  | Rx4-         | CML-O       | Receiver Inverted Data Output.                                                      |       |
| 25  | Rx4+         | CML-O       | Receiver Non-Inverted Data Output.                                                  |       |
| 26  | GND          |             | Module Ground.                                                                      |       |
| 27  | ModPrsL      | LVTTL-O     | Module Present.                                                                     |       |
| 28  | IntL/RxLOSL  | LVTTL-O     | Interrupt. Optionally configurable as RxLOSL via the management interface.          |       |
| 29  | VccTx        |             | +3.3V Transmitter Power Supply.                                                     |       |
| 30  | Vcc1         |             | +3.3V Power Supply.                                                                 |       |
| 31  | LPMoDe/TxDis | LVTTL-I     | Initialization Mode. Optionally configurable as TxDis via the management interface. |       |

|    |          |       |                                      |  |
|----|----------|-------|--------------------------------------|--|
| 32 | GND      |       | Module Ground.                       |  |
| 33 | Tx3+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 34 | Tx3-     | CML-I | Transmitter Inverted Data Input.     |  |
| 35 | GND      |       | Module Ground.                       |  |
| 36 | Tx1+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 37 | Tx1-     | CML-I | Transmitter Inverted Data Input.     |  |
| 38 | GND      |       | Module Ground.                       |  |
| 39 | GND      |       | Module Ground.                       |  |
| 40 | Tx6-     | CML-I | Transmitter Inverted Data Input.     |  |
| 41 | Tx6+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 42 | GND      |       | Module Ground.                       |  |
| 43 | Tx8-     | CML-I | Transmitter Inverted Data Input.     |  |
| 44 | Tx8+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 45 | GND      |       | Module Ground.                       |  |
| 46 | Reserved |       | For Future Use.                      |  |
| 47 | VS1      |       | Module Vendor-Specific 1.            |  |
| 48 | VccRx1   |       | +3.3V Receiver Power Supply.         |  |
| 49 | VS2      |       | Module Vendor-Specific 2.            |  |
| 50 | VS3      |       | Module Vendor-Specific 3.            |  |
| 51 | GND      |       | Module Ground.                       |  |
| 52 | Rx7+     | CML-O | Receiver Non-Inverted Data Output.   |  |
| 53 | Rx7-     | CML-O | Receiver Inverted Data Output.       |  |
| 54 | GND      |       | Module Ground.                       |  |
| 55 | Rx5+     | CML-O | Receiver Non-Inverted Data Output.   |  |
| 56 | Rx5-     | CML-O | Receiver Inverted Data Output.       |  |
| 57 | GND      |       | Module Ground.                       |  |
| 58 | GND      |       | Module Ground.                       |  |
| 59 | Rx6-     | CML-O | Receiver Inverted Data Output.       |  |
| 60 | Rx6+     | CML-O | Receiver Non-Inverted Data Output.   |  |
| 61 | GND      |       | Module Ground.                       |  |
| 62 | Rx8-     | CML-O | Receiver Inverted Data Output.       |  |
| 63 | Rx8+     | CML-O | Receiver Non-Inverted Data Output.   |  |
| 64 | GND      |       | Module Ground.                       |  |
| 65 | NC       |       | Not Connected.                       |  |
| 66 | Reserved |       | For Future Use.                      |  |
| 67 | VccTx1   |       | +3.3V Transmitter Power Supply.      |  |
| 68 | Vcc2     |       | +3.3V Power Supply.                  |  |
| 69 | Reserved |       | For Future Use.                      |  |
| 70 | GND      |       | Module Ground.                       |  |
| 71 | Tx7+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 72 | Tx7-     | CML-I | Transmitter Inverted Data Input.     |  |
| 73 | GND      |       | Module Ground.                       |  |
| 74 | Tx5+     | CML-I | Transmitter Non-Inverted Data Input. |  |
| 75 | Tx5-     | CML-I | Transmitter Inverted Data Input.     |  |
| 76 | GND      |       | Module Ground.                       |  |

Electrical Pin-Out Details



Mechanical Specifications



## 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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