

### **AA1404029-E6-C**

Avaya/Nortel® AA1404029-E6 Compatible TAA Compliant 40GBase-CU QSFP+ Direct Attach Cable (Active Twinax, 1m)

#### **Features:**

- Support for multi-gigabit data rates up to 10Gbps
- Data rates backward compatible to 1Gbps
- Hot-Pluggable SFP 20PIN footprint
- Improved Pluggable from Factor (IPF) compliant for enhanced EMI/EMC performance
- Low Power Consumption 0.2W
- Power Supply 3.3V
- MSA Compatible
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### **Applications:**

- Data Center: Switches, Storage, Servers and Routers
- High density connections between networking equipment

#### **Product Description**

This is a Avaya/Nortel® AA1404029-E6 Compatible 40GBase-CU QSFP+ to QSFP+ direct attach cable that operates over active 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."



## General Specifications

| Parameter                             | Symbol            | Min.    | Typ. | Max.             | Unit  | Notes |
|---------------------------------------|-------------------|---------|------|------------------|-------|-------|
| Storage Temperature                   | Tstg              | -40     |      | 85               | °C    |       |
| Operating Case Temperature            | Tc                | 0       |      | 70               | °C    |       |
| Power Supply Voltage                  | Vcc               | 3.14    | 3.3  | 3.47             | V     |       |
| Power Dissipation                     | P <sub>DISS</sub> |         |      | 0.2              | W     |       |
| Differential Input Impedance          | ZIN               | 90      | 100  | 110              | Ω     | 2     |
| Differential Output Impedance         | ZOUT              | 90      | 100  | 110              | Ω     | 3     |
| Differential Input Voltage Amplitude  | ΔVIN              | 300     |      | 1100             | mVp-p |       |
| Differential Output Voltage Amplitude | ΔVOUT             | 500     |      | 800              | mVp-p |       |
| Skew                                  | Sw                |         |      | 300              | ps    |       |
| Bit Error Rate                        | BR                |         |      | E <sup>-12</sup> |       |       |
| Input Logic Level - High              | VIH               | 2.0     |      | Vcc              | V     |       |
| Input Logic Level - Low               | VIL               | 0       |      | 0.8              | V     |       |
| Output Logic Level - High             | VOH               | Vcc-0.5 |      | Vcc              | V     |       |
| Output Logic Level - Low              | VOL               | 0       |      | 0.4              | V     |       |

### Notes:

1. BER=10<sup>-12</sup> and PRBS 2<sup>31</sup>-1 @10.3125Gbps.
2. Differential input voltage amplitude is measured between Tx#+ and Tx#-.
3. Differential output voltage amplitude is measured between Rx#+ and Rx#-.

## Systems

| Parameter   | Media  | Operating Parameters   |
|---|--|--|
| 10Gbps Line Speed, Full Duplex Bit Error Rate: Better Than 10E <sup>-12</sup> | Hot-Pluggable, Industry-Standard Small Form-Factor Pluggable (SFP+) Copper Cable | Supply Voltage: 3.3V<br>Power Consumption (Per End): Max. 0.2W |

## Optical Characteristics

| Parameter   | Symbol          | Min.                                | Typ. | Max. | Unit | Notes |
|---|-----------------|-------------------------------------|------|------|------|-------|
| Transmitter   |                 |                                     |      |      |      |       |
| Center Wavelength   | $\lambda_C$     | 840                                 | 850  | 860  | nm   |       |
| RMS Spectral Width  | $\Delta\lambda$ |                                     |      | 0.65 | nm   |       |
| Average Launch Power Per Channel                          | POUT            | -7.5                                |      | -2.5 | dBm  |       |
| Difference in Launch Power Between Any Two Lanes (OMA)    |                 |                                     |      |      | dB   |       |
| Extinction Ratio  | ER              | 3                                   |      |      | dB   |       |
| Peak Power Per Lane                                       |                 |                                     |      | 4    | dBm  |       |
| Transmitter and Dispersion Penalty (TDP) Per Lane         | TDP             |                                     |      | 3.5  | dB   |       |
| Average Launch Power of Off Transmitter Per Lane          |                 |                                     |      | -30  | dB   |       |
| Transmitter Eye Mask Definition: (X1, X2, X3, Y1, Y2, Y3) |                 | (0.23, 0.34, 0.43, 0.27, 0.33, 0.4) |      |      |      | 1     |
| Receiver  |                 |                                     |      |      |      |       |
| Center Wavelength   | $\lambda_C$     | 840                                 | 850  | 860  | nm   |       |
| Stressed Receiver Sensitivity in OMA Per Lane             |                 |                                     |      | -5.4 |      | 2     |
| Maximum Average Power at Receiver Input Per Lane          |                 |                                     |      | 2.4  |      |       |
| Receiver Reflectance                                      |                 |                                     |      | -12  |      |       |
| Peak Power Per Lane                                       |                 |                                     |      | 4    |      |       |
| LOS Assert  |                 | -30                                 |      |      |      |       |
| LOS De-Assert – OMA                                       |                 |                                     |      | 7.5  |      |       |
| LOS Hysteresis  |                 | 0.5                                 |      |      |      |       |

### Notes:

1. Hit Ratio =  $5 \times 10^{-5}$ .
2. Measured with conformance test signal at TP3 for BER =  $10e^{-12}$ .

## Pin Descriptions

| Pin | Logic     | Symbol     | Name/Description                       | Notes |
|-----|-----------|------------|--|-------|
| 1   |           | VeeT       | Transmitter Ground.                    |       |
| 2   | LVTTL-O   | Tx_Fault   | N/A.                                   | 1     |
| 3   | LVTTL-I   | Tx_Disable | Transmitter Disable.                   |       |
| 4   | LVTTL-I/O | SDA        | 2-Wire Serial Data.                    |       |
| 5   | LVTTL-I   | SCL        | 2-Wire Serial Clock.                   |       |
| 6   |           | MOD_DEF0   | Module Present. Connected to the VeeT. |       |
| 7   | LVTTL-I   | RS0        | N/A.                                   | 1     |
| 8   | LVTTL-O   | LOS        | Loss of Signal.                        |       |
| 9   | LVTTL-I   | RS1        | N/A.                                   | 1     |
| 10  |           | VeeR       | Receiver Ground.                       |       |
| 11  |           | VeeR       | Receiver Ground.                       |       |
| 12  | CML-O     | RD-        | Receiver Data Inverted.                |       |
| 13  | CML-O     | RD+        | Receiver Data Non-Inverted.            |       |
| 14  |           | VeeR       | Receiver Ground.                       |       |
| 15  |           | VccR       | +3.3V Receiver Supply.                 |       |
| 16  |           | VccT       | +3.3V Transmitter Supply.              |       |
| 17  |           | VeeT       | Transmitter Ground.                    |       |
| 18  | CML-I     | TD+        | Transmitter Data Non-Inverted.         |       |
| 19  | CML-I     | TD-        | Transmitter Data Inverted.             |       |
| 20  |           | VeeT       | Transmitter Ground.                    |       |

### Notes:

1. Signals not supported in SFP+ Copper pulled-down to the VeeT with a 30kΩ resistor.

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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