

### 100G-QSFP-QSFP-AOC-0701-C

Brocade® (Formerly) 100G-QSFP-QSFP-AOC-0701 Compatible TAA Compliant 100GBase-AOC QSFP28 Active Optical Cable (850nm, MMF, 7m)

#### **Features:**

- QSFP28 MSA compliant
- Four independent full-duplex channels
- Supports 103.1Gbps aggregate bit rate
- Operating case temperature: 0 to 70 Celsius
- 4x25G electrical interface (OIF CEI-28G-VSR)
- Single 3.3V power supply
- Maximum power consumption 2.5W each terminal
- RoHS Compliant and Lead Free



### **Applications:**

- 100GBase Ethernet
- InfiniBand EDR

### **Product Description**

This is a Brocade® (Formerly) Compatible 100GBase-AOC QSFP28 to QSFP28 active optical cable that operates over active fiber with a maximum reach of 7m. 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. | Тур. | Max. | Unit |
|------------------------------------|--------|------|------|------|------|
| Storage Temperature                | Tstg   | -40  |      | 85   | °C   |
| Operating Case Temperature         | Тс     | 0    |      | 70   |      |
| Power Supply Voltage               | Vcc    | -0.5 |      | 3.6  | V    |
| Relative Humidity (Non-Condensing) | RH     | 0    |      | 85   | %    |

# **Electrical Characteristics**

| Parameter   | Test Point             | Min.                                       | Тур.     | Max.                                     | Unit | Notes   |  |  |  |
|---|------------------------|--|----------|--|------|---------|--|--|--|
| Power Consumption   |                        |  |          | 2.5                                      | W    | 1       |  |  |  |
| Supply Current  | Icc                    |  |          | 757                                      | mA   | 1       |  |  |  |
| Power Supply Voltage  | Vcc                    | 3.135                                      | 3.3      | 3.465                                    | V    |         |  |  |  |
| Data Rate Per Lane  |                        |  | 25.78125 |  | Gbps |         |  |  |  |
| Data Rate Accuracy  |                        | -100                                       |          | 100                                      | ppm  |         |  |  |  |
| Control Input Voltage - High  |                        | 2  |          | Vcc                                      | V    |         |  |  |  |
| Control Input Voltage - Low   |                        | 0  |          | 0.8                                      | V    |         |  |  |  |
| Transmitter (Per Lane)  | Transmitter (Per Lane) |  |          |  |      |         |  |  |  |
| Overload Differential Voltage   | TP1a                   | 900  |          |  | mV   |         |  |  |  |
| Common-Mode Voltage (Vcm)   | TP1                    | -350                                       |          | 2825                                     | mV   | 2       |  |  |  |
| Differential Termination Resistance<br>Mismatch                                   | TP1                    |  |          | 10                                       | %    | At 1MHz |  |  |  |
| Differential Return Loss (SDD11)  | TP1                    |  |          | See CEI-<br>28G0VSR<br>Equation<br>13-19 | dB   |         |  |  |  |
| Common-Mode to Differential Conversion and Differential to Common-Mode Conversion | TP1                    |  |          | See CEI-<br>28G-VSR<br>Equation<br>13-20 | dB   |         |  |  |  |
| Stressed Input Test   | TP1a                   | See CEI-28G-<br>VSR Section<br>13.3.11.2.1 |          |  |      |         |  |  |  |
| Receiver (Per Lane)   |                        |  |          |  |      |         |  |  |  |
| Differential Voltage (Pk-Pk)  | TP4                    |  |          | 900                                      | mV   |         |  |  |  |
| Common-Mode Voltage (Vcm)   | TP4                    | -350                                       |          | 2850                                     | mV   | 2       |  |  |  |
| Common-Mode Noise (RMS)   | TP4                    |  |          | 17.5                                     | mV   |         |  |  |  |
| Differential Termination Resistance<br>Mismatch                                   | TP4                    |  |          | 10                                       | %    | At 1MHz |  |  |  |

| Differential Return Loss (SDD22)  | TP4 |      | See CEI-<br>28G-VSR<br>Equation<br>13-19 | dB |   |
|---|-----|------|--|----|---|
| Common-Mode to Differential Conversion and Differential to Common-Mode Conversion (SCC22) | TP4 |      | -2                                       | dB | 3 |
| Transition Time (20-80%)  | TP4 | 9.5  |  | ps |   |
| Vertical Eye Closure (VEC)  | TP4 |      | 5.5                                      | dB |   |
| Eye Width at 10 <sup>-15</sup> Probability (EW15)   | TP4 | 0.57 |  | UI |   |
| Eye Height at 10 <sup>-15</sup> Probability (EH15)  | TP4 | 0.57 |  | UI |   |

## Notes:

- 1. Per terminal.
- 2. Vcm is generated by the host. Specification includes the effects of ground offset voltage.
- 3. From 250MHz to 30GHz.

# **Pin Descriptions**

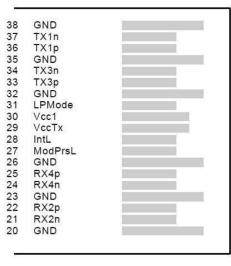
| Pin | Logic      | Symbol  | Name/Description                     | Notes |
|-----|------------|---------|--------------------------------------|-------|
| 1   |            | GND     | Module Ground.                       | 1     |
| 2   | CML-I      | Tx2-    | Transmitter Inverted Data Input.     |       |
| 3   | CML-I      | Tx2+    | Transmitter Non-Inverted Data Input. |       |
| 4   |            | GND     | Module Ground.                       | 1     |
| 5   | CML-I      | Tx4-    | Transmitter Inverted Data Input.     |       |
| 6   | CML-I      | Tx4+    | Transmitter Non-Inverted Data Input. |       |
| 7   |            | GND     | Module Ground.                       | 1     |
| 8   | LVTTL-I    | ModSelL | Module Select.                       | 2     |
| 9   | LVTTL-I    | ResetL  | Module Reset.                        | 2     |
| 10  |            | VccRx   | +3.3V Receiver Power Supply.         |       |
| 11  | LVCMOS-I   | SCL     | 2-Wire Serial Interface Clock.       | 2     |
| 12  | LVCMOS-I/O | SDA     | 2-Wire Serial Interface Data.        | 2     |
| 13  |            | GND     | Module Ground.                       | 1     |
| 14  | CML-O      | Rx3+    | Receiver Non-Inverted Data Output.   |       |
| 15  | CML-O      | Rx3-    | Receiver Inverted Data Output.       |       |
| 16  |            | GND     | Module Ground.                       | 1     |
| 17  | CML-O      | Rx1+    | Receiver Non-Inverted Data Output.   |       |
| 18  | CML-O      | Rx1-    | Receiver Inverted Data Output.       |       |
| 19  |            | GND     | Module Ground.                       | 1     |
| 20  |            | GND     | Module Ground.                       | 1     |

| 21 | CML-O   | Rx2-    | Receiver Inverted Data Output.                          |   |
|----|---------|---------|---|---|
| 22 | CML-O   | Rx2+    | Receiver Non-Inverted Data Output.                      |   |
| 23 |         | GND     | Module Ground.  | 1 |
| 24 | CML-O   | Rx4-    | Receiver Inverted Data Output.                          |   |
| 25 | CML-O   | Rx4+    | Receiver Non-Inverted Data Output.                      |   |
| 26 |         | GND     | Module Ground.  | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present. Internally pulled down to the GND.      |   |
| 28 | LVTTL-O | IntL    | Interrupt output should be pulled up on the host board. | 2 |
| 29 |         | VccTx   | +3.3V Transmitter Power Supply.                         |   |
| 30 |         | Vcc1    | +3.3V Power Supply.                                     |   |
| 31 | LVTTL-I | LPMode  | Low-Power Mode.   | 2 |
| 32 |         | GND     | Module Ground.  | 1 |
| 33 | CML-I   | Tx3+    | Transmitter Non-Inverted Data Input.                    |   |
| 34 | CML-I   | Tx3-    | Transmitter Inverted Data Input.                        |   |
| 35 |         | GND     | Module Ground.  | 1 |
| 36 | CML-I   | Tx1+    | Transmitter Non-Inverted Data Input.                    |   |
| 37 | CML-I   | Tx1-    | Transmitter Inverted Data Input.                        |   |
| 38 |         | GND     | Module Ground.  | 1 |

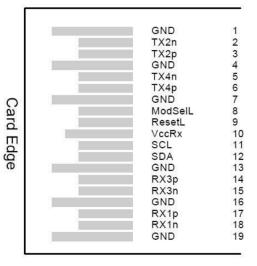
### Notes:

- 1. The module circuit ground is isolated from the module chassis ground within the module.
- 2. Open collector. Should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 3.15V and 3.6V.

## **Electrical Pin-Out Details**

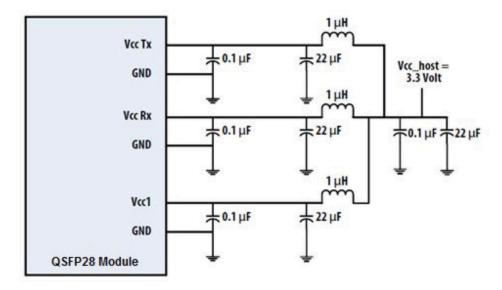


Top Side Viewed from Top

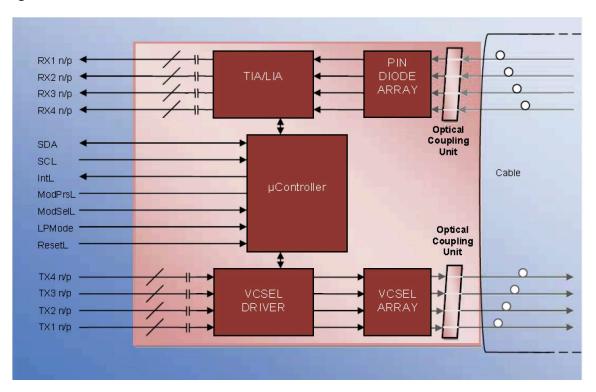


Bottom Side Viewed from Bottom

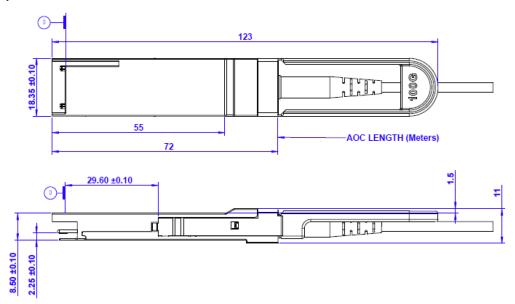
# **Recommended Power Supply Filter**



## **Block Diagram**



# **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.















#### **Contact Information**

ProLabs US

Email: sales@prolabs.com Telephone: 952-852-0252

ProLabs UK

Email: salessupport@prolabs.com Telephone: +44 1285 719 600