



### **MFA1A00-E003-OPC**

Mellanox® MFA1A00-E003 Compatible TAA Compliant 100GBase-AOC QSFP28 Active Optical Cable (850nm, MMF, 3m)

#### **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 Mellanox® MFA1A00-E003 compatible 100GBase-AOC QSFP28 to QSFP28 active optical cable that operates over multi-mode fiber with a maximum reach of 3.0m (9.8ft). At a wavelength of 850nm, it has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This active optical 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.

## General Specifications

| Parameter                          | Symbol | Min. | Typ. | Max. | Unit |
|------------------------------------|--------|------|------|------|------|
| Storage Temperature                | Tstg   | -40  |      | 85   | °C   |
| Operating Case Temperature         | Tc     | 0    |      | 70   |      |
| Power Supply Voltage               | Vcc    | -0.5 |      | 3.6  | V    |
| Relative Humidity (Non-Condensing) | RH     | 0    |      | 85   | %    |

## Electrical Characteristics

| Parameter                                                                         | Test Point | Min.                                | Typ.     | 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)                                                            |            |                                     |          |                                |      |         |
| Overload Differential Voltage                                                     | TP1a       | 900                                 |          |                                | mV   |         |
| Common-Mode Voltage (Vcm)                                                         | TP1        | -350                                |          | 2825                           | mV   | 2       |
| Differential Termination Resistance Mismatch                                      | TP1        |                                     |          | 10                             | %    | At 1MHz |
| Differential Return Loss (SDD11)                                                  | TP1        |                                     |          | See CEI-28G0VSR Equation 13-19 | dB   |         |
| Common-Mode to Differential Conversion and Differential to Common-Mode Conversion | TP1        |                                     |          | See CEI-28G-VSR Equation 13-20 | dB   |         |
| Stressed Input Test                                                               | TP1a       | See CEI-28G-VSR Section 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 Mismatch                                      | TP4        |                                     |          | 10                             | %    | At 1MHz |

|                                                                                           |     |      |  |                                |    |   |
|-------------------------------------------------------------------------------------------|-----|------|--|--------------------------------|----|---|
| Differential Return Loss (SDD22)                                                          | TP4 |      |  | See CEI-28G-VSR Equation 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

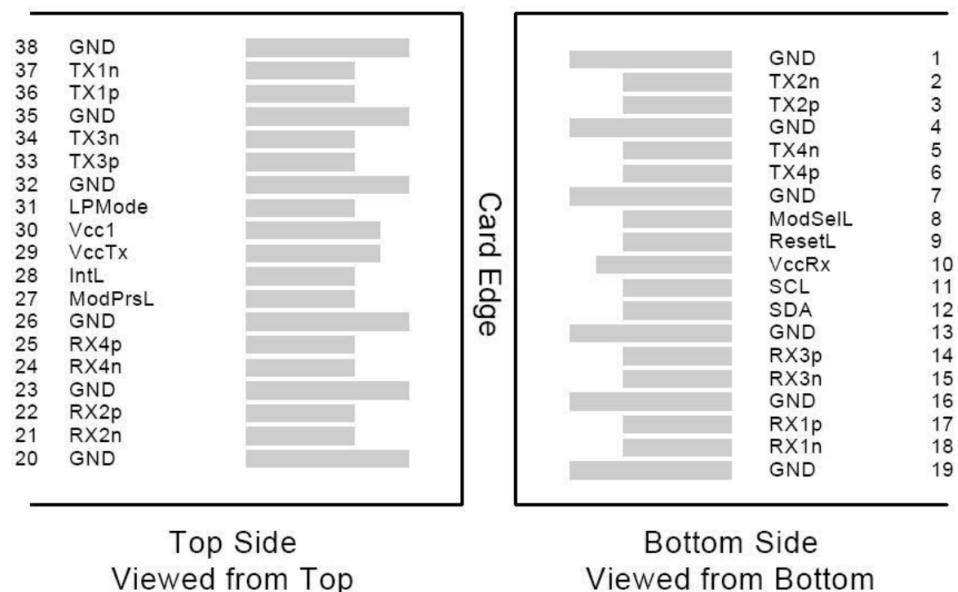
| Pin | Logic       | Symbol  | Name/Description                     | Notes |
|-----|-------------|---------|--------------------------------------|-------|
| 1   |             | GND     | Module Ground.                       | 1     |
| 2   | CML-I       | Tx2-    | Transmitter Inverted Data Input.     |       |
| 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  | LVC MOS-I   | SCL     | 2-Wire Serial Interface Clock.       | 2     |
| 12  | LVC MOS-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 | LPMMode | 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 |

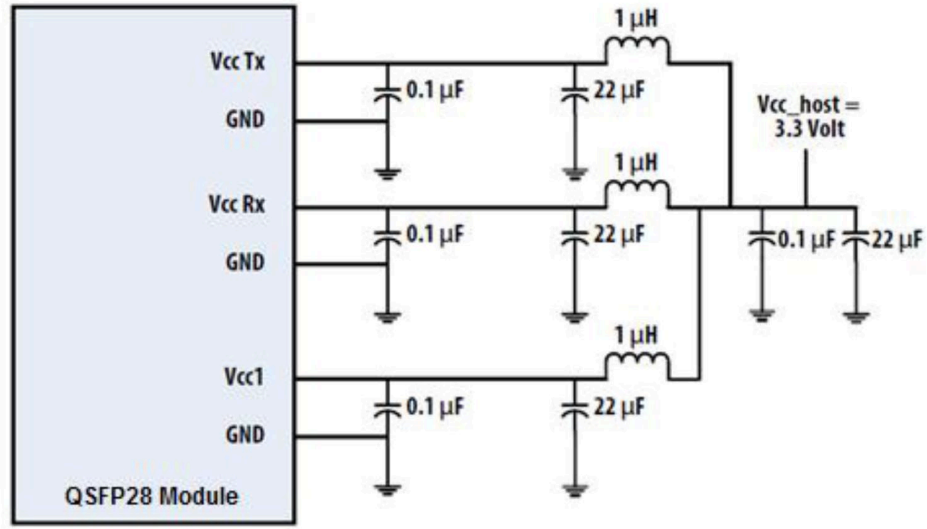
#### Notes:

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

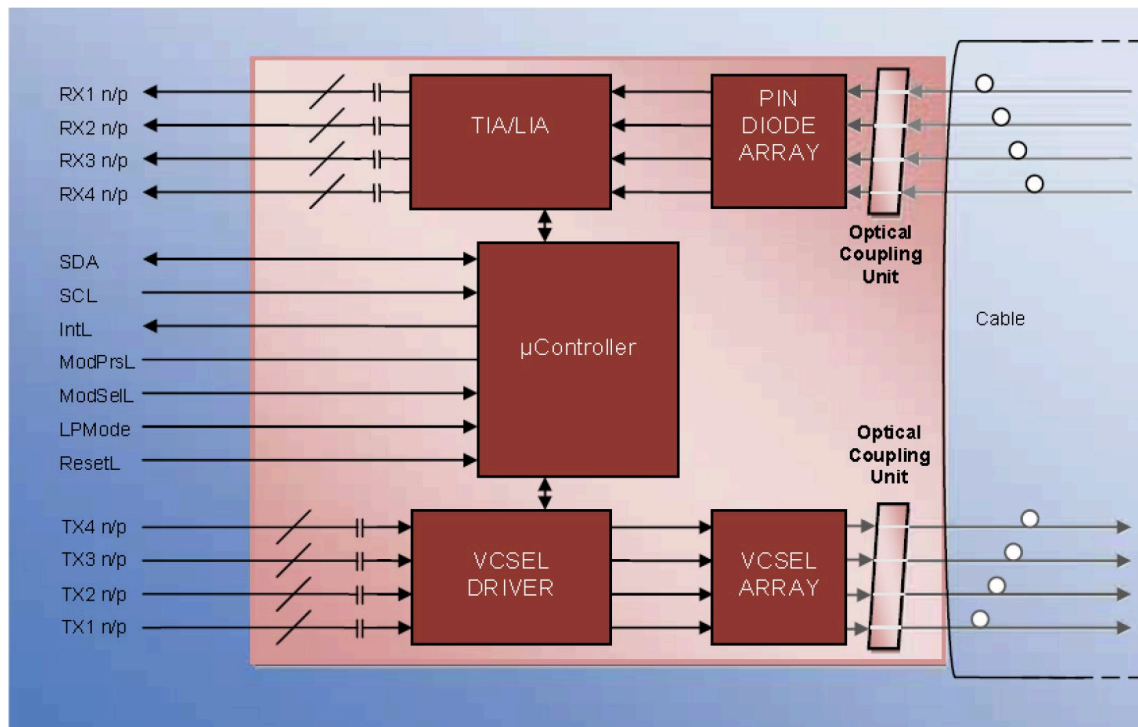
#### Electrical Pin-Out Details



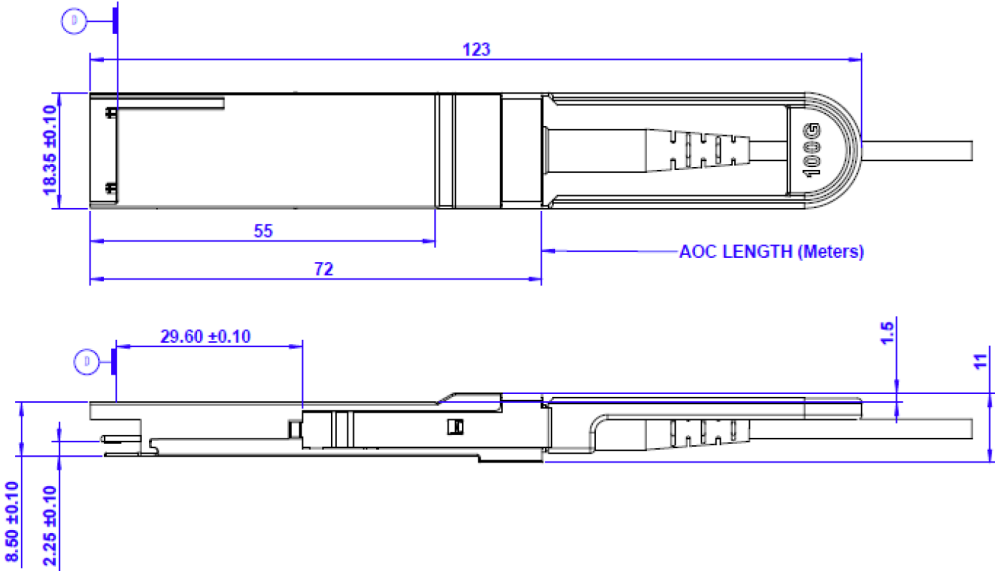
## Recommended Power Supply Filter



## Block Diagram



Mechanical Specifications



## **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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