

## QSFP-100GB-AOC1-5M-FT-AO

Fortinet® Compatible TAA 100GBase-AOC QSFP28 Active Optical Cable (850nm, MMF, 1.5m)

### Features

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



### Applications

- 100GBase Ethernet

### Product Description

This is a Fortinet® Compatible 100GBase-AOC QSFP28 to QSFP28 active optical cable that operates over active fiber with a maximum reach of 1.5m. 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.

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."



## 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

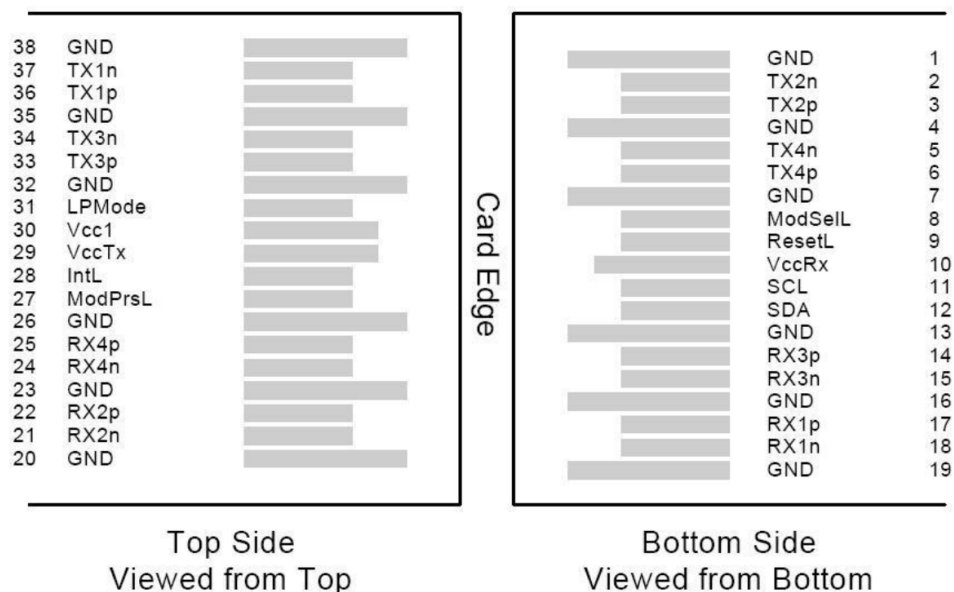
| Pin | Logic       | Symbol  | Name/Description                     | Notes |
|-----|-------------|---------|--------------------------------------|-------|
| 1   |             | GND     | Module Ground.                       | 1     |
| 2   | CML-I       | Tx2-    | Transmitter Inverted Data Input.     |       |
| 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 | 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 |

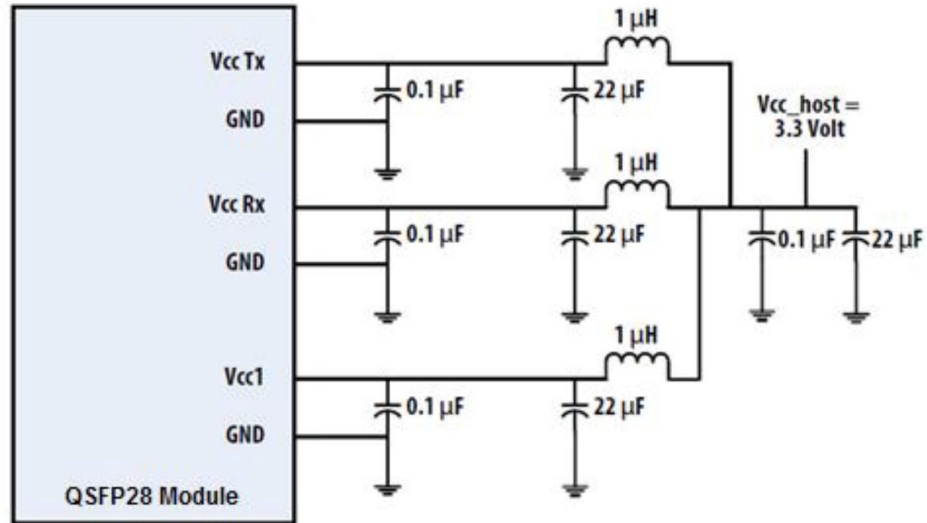
#### Notes:

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

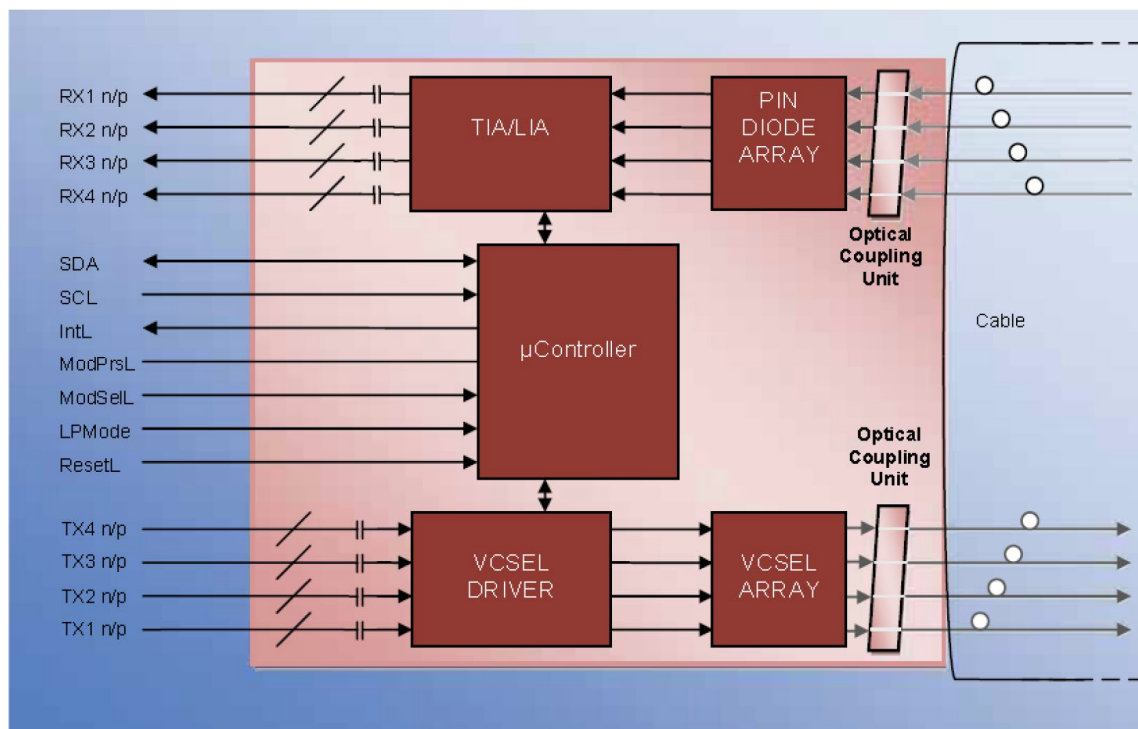
#### Electrical Pin-Out Details



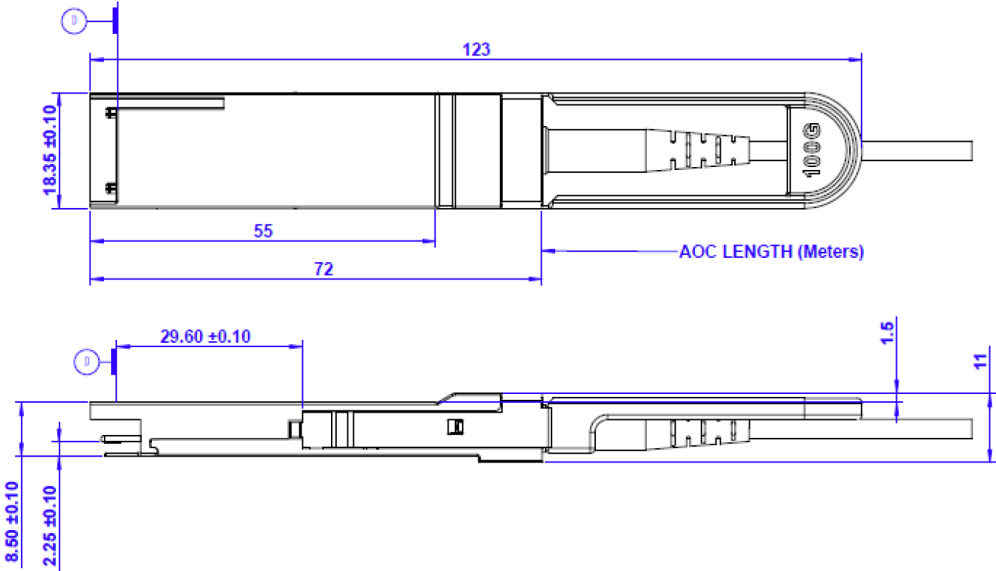
## Recommended Power Supply Filter



## Block Diagram



Mechanical Specifications



## 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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