



### **QSFP-40G-AOC70M-OPC**

MSA and TAA Compliant 40GBase-AOC QSFP+ to QSFP+ Active Optical Cable (850nm, MMF, 70m)

#### **Features**

- Support up to 4x10 Gbps bi-directional operation
- SFF-8436 QSFP+ compliant
- Compliant to the IEEE802.3ba
- Automatic power down while broken cable is detected to improve eye safety
- Reliable VCSEL and PIN photonic devices
- I2C standard management interface
- Excellent high speed signal integrity
- Low power consumption
- Operating Case Temperature 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### **Applications:**

- 10G/40GBase Ethernet
- Proprietary high speed, high density data
- High performance computing, server and data storage

#### **Product Description**

This is an MSA compliant 40GBase-AOC QSFP+ to QSFP+ active optical cable that operates over active with a maximum reach of 70m. 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.

### Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Typ.   | Max. | Unit |
|----------------------------|------------------|------|--------|------|------|
| Supply Voltage             | V <sub>CC</sub>  | -0.5 |        | 3.6  | V    |
| Storage Temperature        | T <sub>stg</sub> | -40  |        | 85   | °C   |
| Operating Case Temperature | T <sub>c</sub>   | 0    | 25     | 70   | °C   |
| Relative Humidity          | RH               | 5    |        | 85   | %    |
| Data Rate Per Channel      |                  |      | 4*10.3 |      | Gbps |

### Electrical Specifications

| Parameter           | Symbol            | Min.  | Typ. | Max.  | Unit | Notes |
|---------------------|-------------------|-------|------|-------|------|-------|
| Supply Voltage      | V <sub>CC</sub>   | 3.135 | 3.3  | 3.465 | V    |       |
| Supply Current      | I <sub>CC</sub>   |       |      | 400   | mA   |       |
| Power Dissipation   | P <sub>DISS</sub> |       |      | 1500  | mW   |       |
| Clock Rate - I2C    |                   |       |      | 400   | KHz  | 1     |
| Module Turn-On Time |                   |       |      | 2000  | ms   | 2     |

#### Notes:

1. For the management interface.
2. Time from module power-on/insertion/ResetL de-assert to module fully functional.

## Optical Characteristics

| Parameter                                     | Symbol  | Min. | Typ.   | Max. | Unit | Notes |
|-----------------------------------------------|---------|------|--------|------|------|-------|
| <b>Transmitter</b>                            |         |      |        |      |      |       |
| Reference Differential Input                  | Zd      |      | 100    |      | Ω    | 1     |
| Optical Return Loss Tolerance                 |         |      |        | 12   | dB   |       |
| Differential Data Input Swing                 | VIN,pp  | 180  |        | 1200 | mV   |       |
| Differential Data Input Threshold             |         |      | 50     |      | mV   | 2     |
| <b>Receiver</b>                               |         |      |        |      |      |       |
| Reference Differential Input Impedance        | Zd      |      | 100    |      | Ω    | 1     |
| Differential Data Output Swing                | VOUT,pp | 0    |        | 800  | mV   |       |
| Pre-Emphasis Pulse Amplitude Percentage       |         | 0    |        |      | %    | 4     |
|                                               |         | 10   |        |      | %    |       |
|                                               |         | 20   |        |      | %    |       |
|                                               |         | 40   |        |      | %    |       |
| Pre-Emphasis Pulse Duration                   |         |      | 30     |      | ps   |       |
| Signal Speed                                  |         |      | 4*10.3 |      | Gbps |       |
| Differential Data Output Swing                |         | 150  |        | 850  | mV   |       |
| Differential Data Output Swing When Squelched |         |      |        | 50   | mV   |       |
| Rise/Fall Time (20-80%)                       |         | 24   |        |      | ps   |       |

### Notes:

1. AC coupled inside the AOC module.
2. Input swing to trigger Tx-squelch.
3. User selectable. Percentage is the ratio of pre-emphasis amplitude to output swing. Users could change by writing to page 3 address 237, default value is "10."

## Pin Descriptions

| Pin | Logic       | Symbol  | Name/Description                                        | Note |
|-----|-------------|---------|---------------------------------------------------------|------|
| 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/O | 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.                        |      |

### Notes:

1. GND is the symbol for signal and supply (power). Connect these directly to the host board signal common ground plane.

- VccRx, Vcc1, and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP+. The connector pins are each rated for a maximum current of 500mA.

## Pin Assignment and Pin Description



## Recommended Application Interface Circuit



Mechanical Specifications

| Parameter                               | Symbol | Min.       | Typ. | Max.       | Unit   | Notes |
|-----------------------------------------|--------|------------|------|------------|--------|-------|
| AOC Cable Length (L>5m)                 | L      | L-(L*1.1%) | L    | L+(L*1.1%) | M      |       |
| Module Retention                        |        | 90         |      | 170        | N      |       |
| Module Insertion                        |        | 0          |      | 18         | N      |       |
| Module Extraction                       |        | 0          |      | 25         | N      |       |
| Cable Pull Strength – Apply Load at 0°  |        | 44         |      |            | N      |       |
| Cable Pull Strength – Apply Load at 90° |        | 33         |      |            | N      |       |
| Clearance Out of IO Bezel               |        | 75         |      |            | mm     |       |
| Cable Bending Radius                    |        | 3          |      |            | cm     |       |
| Insertion/Removal Cycles                |        | 50         |      |            | Cycles |       |



Clearance 75mm Is Required.  
Cable Type: Low Smoke Zero Halogen

## **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**

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#### **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.

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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.

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Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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