

### QSFP-4SFP-AOC15M-PRO

MSA and TAA 40GBase-AOC QSFP+ to 4xSFP+ Active Optical Cable (850nm, MMF, 15m)

#### Features

- 850nm VCSEL transmitter, PIN photo-detector receiver
- Electrical interface compliant to QSFP+ connector (SFF-8436) and SFP+ connectors (SFF-8431)
- All-metal housing for superior EMI performance
- Operating temperature: 0 to 70 Celsius
- RoHS compliant and Lead free
- Hot Pluggable



#### Applications:

- 40GBase Ethernet
- Fiber Channel Application
- InfiniBand QDR, SDR, DDR
- Servers, switches, storage, and host card adapters

#### Product Description

This is a MSA Compliant 40GBase-AOC QSFP+ to 4xSFP+ active optical cable that operates over active fiber with a maximum reach of 15m. 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.

Proline'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.



## QSFP Interface Specifications

| Parameter                   | Description                          |
|-----------------------------|--------------------------------------|
| Module Form Factor          | QSFP+ (Supports SFF-8436/SFF-8472)   |
| Channel Data Rate           | Rate 40Gbps                          |
| BER                         | $<10^{-12}$                          |
| Operating Case Temperature  | 0 °C to 70°C                         |
| Storage Temperature         | -20 °C to 85°C                       |
| Supply Voltage              | 3.3V                                 |
| Supply Current              | 180mA Per End Typical                |
| Management Interface Serial | I <sup>2</sup> C (Supports SFF-8472) |

## Optical Characteristics

| Parameter  | Symbol          | Min.                                | Typ. | Max. | Unit | Notes                          |
|--|-----------------|-------------------------------------|------|------|------|--------------------------------|
| <b>Transmitter</b>                                     |                 |                                     |      |      |      |                                |
| Center Wavelength                                      | $\lambda_C$     | 840                                 | 850  | 860  | nm   |                                |
| RMS Spectral Width                                     | $\Delta\lambda$ |                                     |      | 0.65 | nm   |                                |
| Average Launch Power Per Lane                          | 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   |                                |
| Eye Mask Coordinates: (X1, X2, X3, Y1, Y2, Y3)         |                 | (0.23, 0.34, 0.43, 0.27, 0.33, 0.4) |      |      |      | Hit Ratio = $5 \times 10^{-5}$ |
| <b>Receiver</b>  |                 |                                     |      |      |      |                                |
| Center Wavelength                                      | $\lambda_C$     | 840                                 | 850  | 860  | nm   |                                |
| Stressed Receiver Sensitivity in OMA Per Lane          |                 |                                     |      | -5.4 |      | 1                              |
| 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. Measured with conformance test signal at TP3 for BER= $10E^{-12}$ .

## SFP+ Interface Specifications

| Parameter                   | Description                             |
|-----------------------------|---|
| Module Form Factor          | SFP+ (Supports SFF8431/SFF8432/SFF8472) |
| Channel Data Rate           | Rate 1 to 10.3125Gbps                   |
| BER                         | $<10^{-12}$                             |
| Operating Case Temperature  | 0 to 70°C                               |
| Storage Temperature         | -20 to 85°C                             |
| Supply Voltage              | 3.3V                                    |
| Supply Current              | 455mA Maximum                           |
| Management Interface Serial | I <sup>2</sup> C (Supports SFF-8472)    |

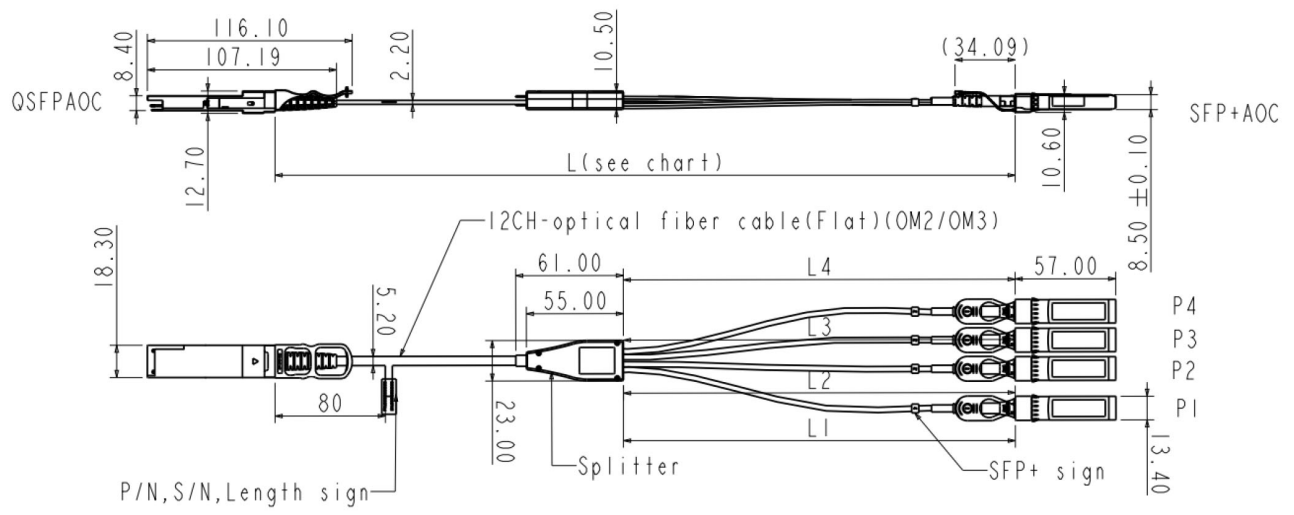
## Optical Characteristics

| Parameter                      | Symbol          | Min. | Typ. | Max.   | Unit  | Notes           |
|--------------------------------|-----------------|------|------|--------|-------|-----------------|
| <b>Transmitter</b>             |                 |      |      |        |       |                 |
| Center Wavelength              | $\lambda_C$     | 840  | 850  | 860    | nm    |                 |
| RMS Spectral Width             | $\Delta\lambda$ |      |      | Note 1 | nm    |                 |
| Average Optical Power          | $P_{avg}$       | -6.5 |      | -1     | dBm   | 2               |
| Extinction Ratio               | ER              | 3.5  |      |        | dB    | 3               |
| Transmitter Dispersion Penalty | TDP             |      |      | 3.9    | dB    |                 |
| Relative Intensity Noise       | RIN             |      |      | -128   | dB/Hz | -12B Reflection |
| Optical Return Loss Tolerance  |                 |      |      | 12     | dB    |                 |
| <b>Receiver</b>                |                 |      |      |        |       |                 |
| Center Wavelength              | $\lambda_C$     | 840  | 850  | 860    | nm    |                 |
| Receiver Sensitivity           | $P_{sens}$      |      |      | -11.1  | dBm   | 4               |
| Stressed Sensitivity in OMA    |                 |      |      | -7.5   | dBm   | 4               |
| LOS Function                   | LOS             | -30  |      | -12    | dBm   |                 |
| Overload                       | $P_{in}$        |      |      | -1.0   | dBm   | 4               |
| Receiver Reflectance           |                 |      |      | -12    | dB    |                 |

### Notes:

1. Trade-offs are available between spectral width, center wavelength, and minimum OMA.
2. The optical power is launched into MMF.
3. Measured with a PRBS  $2^{31}-1$  test pattern @10.3125Gbps.
4. Measured with a PRBS  $2^{31}-1$  test pattern @10.3125Gbps and  $BER \leq 10^{-12}$ .

## Mechanical Specifications



**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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