

## Features:

- QSFP-DD MSA Compliant
- Compliant with IEEE 802.3cd and CEI-56-G-VSR-PAM
- Built in Analog CDR
- Low latency for high performance computing application
- Enabled by 850nm VCSEL
- Operating case temperature: 0 to 70°C
- Hot pluggable
- Power consumption 7.2W in 400G QSFP-DD
- Transmission distance up to 100m with OM3 MM fiber
- Laser Eye Safety Class 1



- Management interface based on CMIS 3.0 (QSFP-DD)
- RoHS compliant

## Applications:

- 400G interconnection
- Data center

## 1. General Description

Approved Networks' 400G Active Optical Cables (AOCs) fill the need for short- range, cost-effective connectivity. In high-capacity interconnections, AOCs provide a power-efficient, easy-to-use replacement for optical transceivers and fiber jumper cables. These cables are fully compliant with EEPROM and memory map requirements to assure proper system identification and interoperability.

## 2. Absolute Maximum Ratings

| Parameter            | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------|--------|------|------|------|------|------|
| Storage Temperature  | Ts     | -40  | -    | 85   | °C   |      |
| Relative Humidity    | RH     | 5    | -    | 85   | %    |      |
| Power Supply Voltage | VCC    | -0.3 | -    | 3.6  | V    |      |

### 3. Recommended Operating Conditions

| Parameter                  | Symbol            | Min. | Typ.   | Max. | Unit | Note                     |
|----------------------------|-------------------|------|--------|------|------|--------------------------|
| Case Operating Temperature | Tcase             | 0    |        | 70   | °C   |                          |
| Power Supply Voltage       | VCC               | 3.14 | 3.3    | 3.47 | V    |                          |
| Data Rate                  | BR                |      | 53.125 |      | Gbps | TX Rate/RX Rate per lane |
| Transmission Distance      | TD                |      |        | 100  | m    |                          |
| Total power consumption    |                   |      | 7.2    |      | W    |                          |
| Coupled fiber              | Single mode fiber |      |        |      |      | OM3 fiber                |

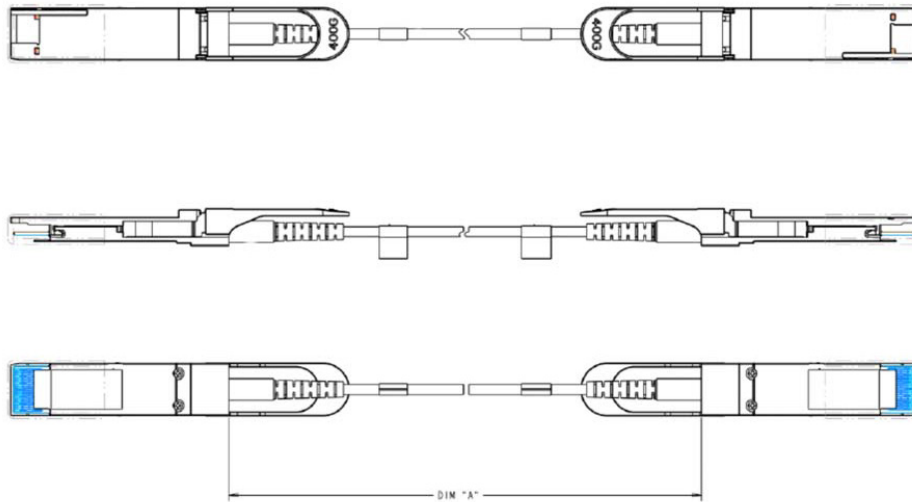
### 4. Electrical Interface Characteristics

| Parameter                         | Symbol  | Min.  | Typ. | Max.    | Unit  | Note |
|-----------------------------------|---------|-------|------|---------|-------|------|
| <b>Transmitter</b>                |         |       |      |         |       |      |
| Transmitter Fault Output-High     | VFaultH | 2     | -    | Vcc+0.3 | V     |      |
| Transmitter Fault Output-Low      | VFaultL | 0     | -    | 0.8     | V     |      |
| Transmitter Disable Voltage- High | VDisH   | 2     | -    | Vcc+0.3 | V     |      |
| Transmitter Disable Voltage- Low  | VDisL   | 0     | -    | 0.8     | V     |      |
| Differential input impedance      |         | 90    | 100  | 110     | Ohm   |      |
| DC common mode voltage            |         | -350  |      | 2850    | mV    |      |
| Differential eye height           |         |       |      | 900     | mVdpp |      |
| <b>Receiver</b>                   |         |       |      |         |       |      |
| LOS Output Voltage-High           | VLOSH   | 2     | -    | Vcc+0.3 | V     |      |
| LOS Output Voltage-Low            | VLOSL   | 0     | -    | 0.8     | V     |      |
| Differential output impedance     |         | 90    | 100  | 110     | Ohm   |      |
| Differential eye height           |         | 228   |      | 900     | mVdpp |      |
| DC common mode voltage            |         | -350  |      | 2850    | mV    |      |
| AC common mode noise              |         |       |      | 17.5    | mVrms |      |
| Eye height @ 1e-5 (all PAM4 eyes) |         | 70    |      |         | mV    |      |
| Eye width @ 1e-5 (all PAM4 eyes)  |         | 0.265 |      |         | UI    |      |

### 5. Cable Specifications

| Parameter                   | Value                   | Note                        |
|-----------------------------|-------------------------|-----------------------------|
| Type                        | OM3 MM Loose tube fiber |                             |
| Minimum bending radius (mm) | 30                      |                             |
| Cable outer diameter (mm)   | 3.8 +/- 0.15 (16core)   |                             |
| Cable length (m)            | 100 (max)               | Customized length available |

## 6. Outline Dimensions



**Note:** External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

## 7. Contact Information

Approved Networks is the industry authority on enterprise class, third-party networking products for the smart data center. For over a decade our technical expertise has allowed us to consistently deliver first-to-market compatibility solutions in the most rigorous, optical networking environments. Headquartered in Southern California, Approved Networks provides technical, logistical and sales support to over 3,000 clients in 30 countries.

Corporate Offices: **Approved Networks, Inc.**

Tel: 800.590.9535

Web: <http://www.approvednetworks.com>