

## Q56-2Q56-200GB-AOC10MIBLZ-C

MSA and TAA Compliant 200G-AOC QSFP56 to 2xQSFP56 Infiniband HDR Active Optical Cable (850nm, MMF, 10m, LSZH)

### Features

- Low latency DSP-free electronics-based CDR
- Multi-data rate up to 56.15 Gb/s per lane
- PAM4 modulation
- Single 3.3 V power supply
- Low power consumption: 3.6W on 200G end with all CDRs enabled
- Up to 10m length
- SFF-8665 compliant
- SFF-8636 compliant I2C management interface
- Operating case temperature: 0°C to 70°C
- Hot pluggable
- RoHS/REACH compliant
- TUV-certified
- LSZH, Aqua cable



### Application

- IEEE 802.3cd 200GBASE SR4
- IBTA InfiniBand HDR
- Datacenter: servers, switches, storages and NIC adapters
- Proprietary HPC interconnections

### Product Description

This is an MSA compliant 200GBase-AOC QSFP56 to 2xQSFP56 active optical cable that operates over multi-mode fiber with a maximum reach of 10.0m (32.8ft). 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.

ProLabs' active optical cables 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."



### Absolute Maximum Ratings

| Parameter                     | Symbol              | Min | Typ. | Max. | Unit |
|-------------------------------|---------------------|-----|------|------|------|
| Supply Voltage                | V <sub>in</sub>     | 0   |      | 4.0  | V    |
| Input Swing                   | V <sub>in-max</sub> |     |      | 1500 | mVpp |
| Storage Temperature (Ambient) | T <sub>stc</sub>    | -40 |      | 85   | °C   |
| Relative Humidity             | RH                  | 5   |      | 85   | %    |

### Recommended Operating Specifications

| Parameter                  | Symbol          | Min             | Typ. | Max. | Unit | Notes |
|----------------------------|-----------------|-----------------|------|------|------|-------|
| Operating Case Temperature | T <sub>op</sub> | 0               |      | 70   | °C   |       |
| Power Supply Voltage       | V <sub>cc</sub> | 3.15            | 3.30 | 3.47 | V    |       |
| Power Supply Current       | 200G End        | I <sub>CC</sub> | 1100 | 1250 | mA   | 1     |
|                            | 100G End        | I <sub>CC</sub> | 750  |      | mA   | 1     |
| Power Consumption          | 200G End        | P               | 3.6  | 4.0  | W    | 1     |
|                            | 100G End        | P               | 2.3  | 2.5  | W    | 1     |

#### Notes:

1. Per end, all channel CDRs are enabled.

### Electrical Characteristics

| Parameter                        | Symbol              | Min | Typ     | Max                  | Unit | Notes |
|----------------------------------|---------------------|-----|---------|----------------------|------|-------|
| Data Rate (Per Channel)          | BR                  |     | 26.5625 |                      | GBd  | 1     |
| <b>Transmitter</b>               |                     |     |         |                      |      |       |
| Input Differential Impedance     | R <sub>IN</sub>     |     | 100     |                      | Ω    |       |
| Differential Data Input Swing    | V <sub>INP-P</sub>  | 300 |         | 900                  | mV   |       |
| <b>Receiver</b>                  |                     |     |         |                      |      |       |
| Output Differential Impedance    | R <sub>OUT</sub>    |     | 100     |                      | Ω    |       |
| Differential Data Output Swing   | V <sub>OUTP-P</sub> | 300 | 700     | 900                  | mV   |       |
| Bit Error Ratio (at 26.5625 GBd) |                     |     |         | 2.4×10 <sup>-4</sup> |      | 2     |

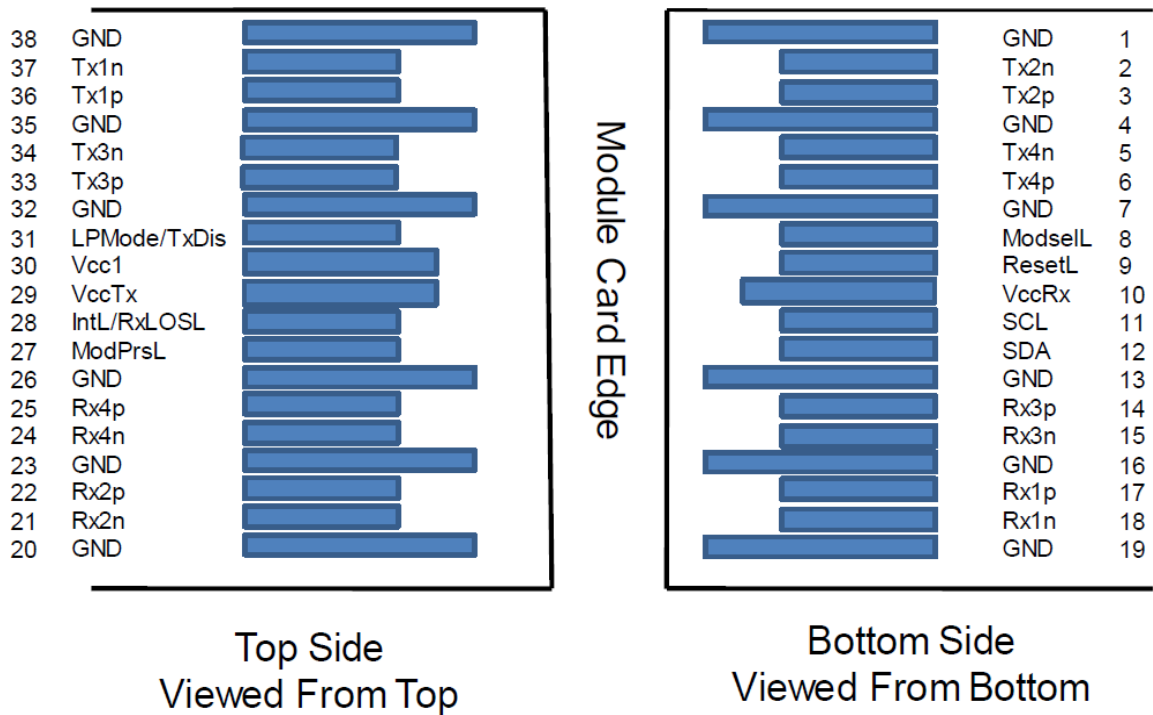
#### Notes:

1. Dual data rate of 25.78125 and 28.07618 Gbaud are available upon request.
2. Pre-FEC Bit Error Ratio with a PRBS 2<sup>31</sup> – 1 test pattern over a normal operating temperature range.

### Active Optical Cable Specifications

| Parameter           | Value                            | Unit | Note            |
|---------------------|----------------------------------|------|-----------------|
| Cable Diameter      | LSZH: $\varnothing 3.0 \pm 0.15$ | mm   |                 |
| Minimum Bend Radius | 30                               | mm   | Without tension |
| Length Tolerance    | +300 / -0                        | mm   |                 |
| Cable Jacket        | LSZH, Aqua                       |      |                 |

### Electrical Pin-Out Details



## Pin Descriptions

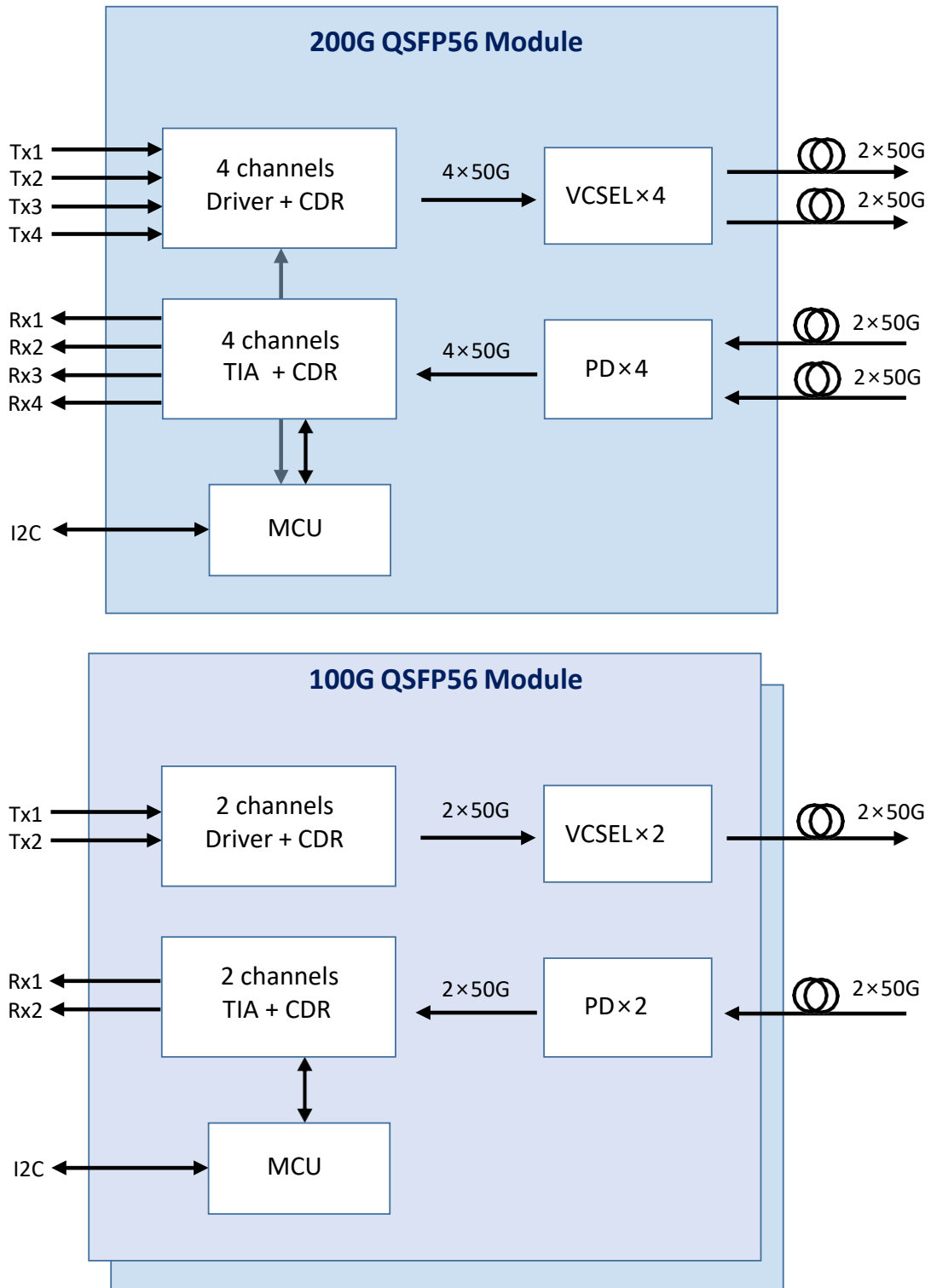
| Pin | Logic       | Symbol  | Description                         | Notes |
|-----|-------------|---------|-------------------------------------|-------|
| 1   |             | GND     | Ground                              | 1     |
| 2   | CML-I       | Tx2n    | Transmitter Inverted Data Input     |       |
| 3   | CML-I       | Tx2p    | Transmitter Non-Inverted Data Input |       |
| 4   |             | GND     | Ground                              | 1     |
| 5   | CML-I       | Tx4n    | Transmitter Inverted Data Input     |       |
| 6   | CML-I       | Tx4p    | Transmitter Non-Inverted Data Input |       |
| 7   |             | GND     | Ground                              | 1     |
| 8   | LVTTTL-I    | ModSelL | Module Select                       |       |
| 9   | LVTTTL-I    | ResetL  | Module Reset                        |       |
| 10  |             | Vcc Rx  | +3.3V Power supply receiver         | 2     |
| 11  | LVC MOS-I/O | SCL     | 2-wire serial interface clock       |       |
| 12  | LVC MOS-I/O | SDA     | 2-wire serial interface data        |       |
| 13  |             | GND     | Ground                              | 1     |
| 14  | CML-O       | Rx3p    | Receiver Non-Inverted Data Output   |       |
| 15  | CML-O       | Rx3n    | Receiver Inverted Data Output       |       |
| 16  |             | GND     | Ground                              | 1     |
| 17  | CML-O       | Rx1p    | Receiver Non-Inverted Data Output   |       |
| 18  | CML-O       | Rx1n    | Receiver Inverted Data Output       |       |
| 19  |             | GND     | Ground                              | 1     |
| 20  |             | GND     | Ground                              | 1     |
| 21  | CML-O       | Rx2n    | Receiver Inverted Data Output       |       |
| 22  | CML-O       | Rx2p    | Receiver Non-Inverted Data Output   |       |
| 23  |             | GND     | Ground                              | 1     |
| 24  | CML-O       | Rx4n    | Receiver Inverted Data Output       |       |
| 25  | CML-O       | Rx4p    | Receiver Non-Inverted Data Output   |       |
| 26  |             | GND     | Ground                              | 1     |
| 27  | LVTTTL-O    | ModPrsL | Module Present                      |       |
| 28  | LVTTTL-O    | IntL    | Interrupt                           |       |
| 29  |             | Vcc Tx  | +3.3V Power supply transmitter      | 2     |
| 30  |             | Vcc 1   | +3.3V Power Supply                  | 2     |
| 31  | LVTTTL-I    | LPMode  | Low Power Mode                      |       |
| 32  |             | GND     | Ground                              | 1     |
| 33  | CML-I       | Tx3p    | Transmitter Non-Inverted Data Input |       |
| 34  | CML-I       | Tx3n    | Transmitter Inverted Data Input     |       |

|    |       |      |                                     |   |
|----|-------|------|-------------------------------------|---|
| 35 |       | GND  | Ground                              | 1 |
| 36 | CML-I | Tx1p | Transmitter Non-Inverted Data Input |   |
| 37 | CML-I | Tx1n | Transmitter Inverted Data Input     |   |
| 38 |       | GND  | Ground                              | 1 |

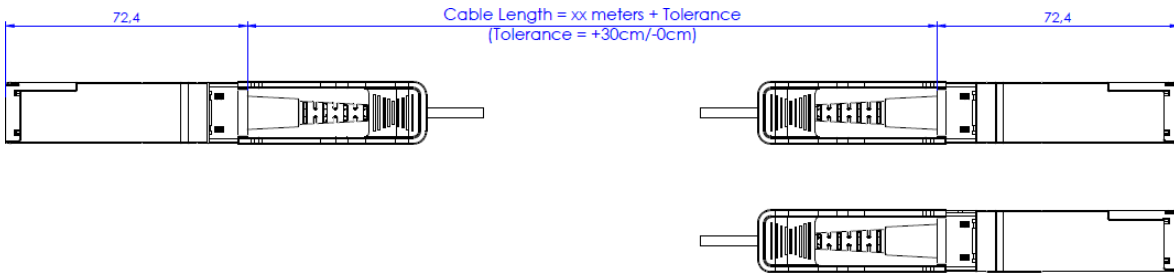
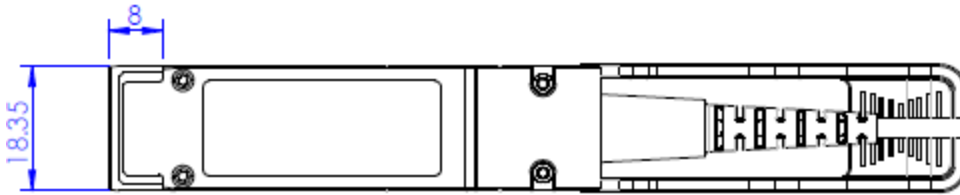
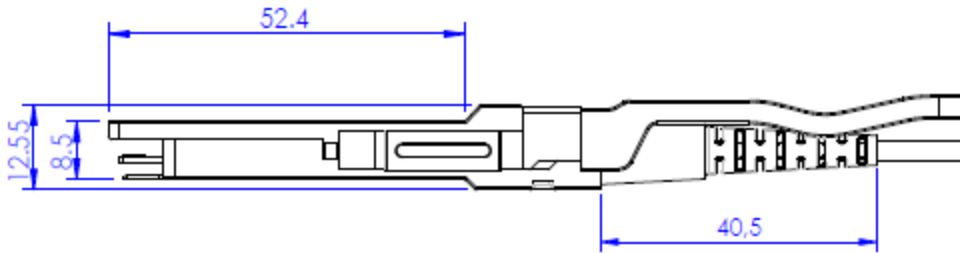
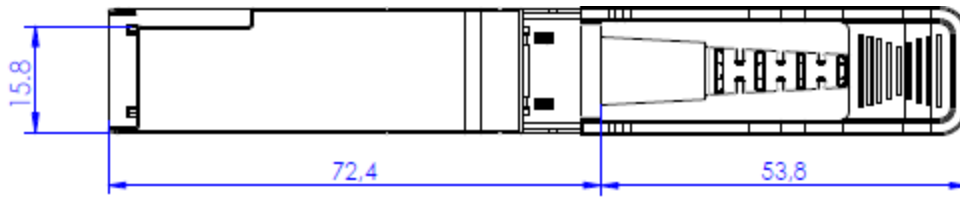
**Note:**

1. GND is the symbol for signal and supply (power) common for the QSFP module. All are common within the QSFP module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500 mA.

## Block Diagram



# Mechanical Specification



**About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

**Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

**Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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