

## LQ-AOC11200-10

### QSFP56 to 2xQSFP56 Active Optical Cable

#### Features

- Active optical cable with breakout from QSFP56 200G to two QSFP56 100G
- Up to 53.125Gbps data rate per channel PAM4 modulation
- Integrated 850nm VCSEL array and PD array
- DDM function implemented
- Hot-pluggable
- Low power dissipation: : <4W on 200G end, <3W on 100G end
- Commercial operating case temperature range: 0°C to 70 °C
- Compliant with ROHS2.0

#### Applications

- Data centers and Cloud Network
- 200G InfiniBand HDR systems

#### Standards

- IEEE 802.3cd
- InfiniBand 4xHDR
- SFF 8679
- CMIS4.0 or SFF8636



### Absolute Maximum Ratings

| Product      | Electrical mode | Protocol    | Nominal Rate     |                         |      | Specifications        |   | Link     |
|--------------|-----------------|-------------|------------------|-------------------------|------|-----------------------|---|----------|
|              |                 |             | Aggregate (Gbps) | Electrical Lanes(Gbaud) | ppm  | High Speed Electrical | Pre-FEC Max BER                                     |          |
| 200G end     | 4X50            | IEEE802.3cd | 212.5            | 26.5625 PAM4            | ±100 | 200GAUI-4             | 1E-6 for InfiniBand HDR;<br>2.4E-4 for 200GBASE-SR4 | 0.5~100m |
| Per 100G end | 2X50            | IEEE802.3cd | 106.25           | 26.5625 PAM4            | ±100 | 200GAUI-4             |   |          |

| Parameter                  | Symbol | Unit | Min  | Max |
|----------------------------|--------|------|------|-----|
| Case Operating Temperature | Top    | °C   | 0    | 70  |
| Storage Temperature Range  | Ts     | °C   | -40  | 85  |
| Relative Humidity          | RH     | %    | 0    | 85  |
| Power Supply Voltage       | Vcc    | V    | -0.5 | 3.6 |

### Recommended Operating Conditions

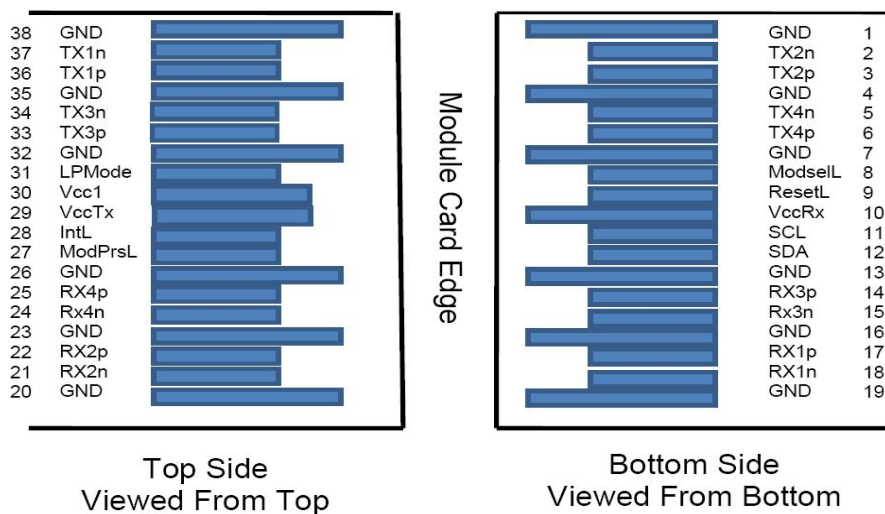
| Parameter                        | Symbol | Unit | Min   | Typ | Max   |
|----------------------------------|--------|------|-------|-----|-------|
| Operating Case Temperature Range | Tca    | °C   | 0     | /   | 70    |
| Power Supply Voltage             | Vcc    | V    | 3.135 | 3.3 | 3.465 |

## Electric Ports Definition

| Parameter                         | Symbol             | Unit  | Min             | Typ | Max                  | Notes    |
|-----------------------------------|--------------------|-------|-----------------|-----|----------------------|----------|
| Supply Voltage                    | VCC                | V     | 3.135           | 3.3 | 3.465                |          |
| Power Consumption                 | PC                 | W     |                 |     | 4                    | 200G end |
|                                   |                    |       |                 |     | 3                    | 100G end |
| <b>Transmitter</b>                |                    |       |                 |     |                      |          |
| Input Differential Impedance      | R <sub>IN</sub>    | Ω     | 80              | 100 | 120                  |          |
| Single Ended Data Input Swing     | V <sub>IN</sub>    | mVp-p | 90              |     | 500                  |          |
| Transmit Disable Voltage          | V <sub>DIS</sub>   | V     | 2               |     | V <sub>CCHOST</sub>  |          |
| Transmit Enable Voltage           | V <sub>EN</sub>    | V     | V <sub>EE</sub> |     | VEE+0.8              |          |
| Transmit Fault Assert Voltage     | V <sub>FA</sub>    | V     | 2               |     | V <sub>CCHOST</sub>  |          |
| Transmit Fault De-Assert Voltage  | V <sub>FDA</sub>   | V     | V <sub>EE</sub> |     | V <sub>EE</sub> +0.8 |          |
| <b>Receiver</b>                   |                    |       |                 |     |                      |          |
| Single Ended Data Output Swing    | V <sub>OD</sub>    | mVp-p | 200             |     | 500                  |          |
| LOS Fault                         | V <sub>LOSFT</sub> | V     | 2               |     | V <sub>CCHOST</sub>  |          |
| LOS Normal                        | V <sub>LOSNR</sub> | V     | V <sub>EE</sub> |     | V <sub>EE</sub> +0.8 |          |
| Differential termination mismatch |                    | %     |                 |     | 10                   |          |
| <b>IIC communication</b>          |                    |       |                 |     |                      |          |
| IIC Clock frequency               | -                  | KHZ   | /               | 100 | 400                  |          |
| clock stretching                  | -                  | us    | /               | /   | 500                  |          |

## Pin Description

The electrical interface to the transceiver is a 38 pins edge connector. The 38 pins provide high speed data, low speed monitoring and control signals, I2C communication, power and ground connectivity. The top and bottom views of the connector are provided below, as well as a table outlining the contact numbering, symbol and full description.



| Pin | Symbol  | Name/Description                              |
|-----|---------|---|
| 1   | GND     | Ground  |
| 2   | Tx2n    | Channel 2 Transmitter Inverted Data Input     |
| 3   | Tx2p    | Channel 2 Transmitter Non-Inverted Data Input |
| 4   | GND     | Ground  |
| 5   | Tx4n    | Channel 4 Transmitter Inverted Data Input     |
| 6   | Tx4p    | Channel 4 Transmitter Non-Inverted Data Input |
| 7   | GND     | Ground  |
| 8   | ModSelL | Module Select                                 |
| 9   | ResetL  | Module Reset                                  |
| 10  | Vcc Rx  | +3.3 V Power supply receiver                  |
| 11  | SCL     | 2-wire serial interface clock                 |
| 12  | SDA     | 2-wire serial interface data                  |
| 13  | GND     | Ground  |
| 14  | Rx3p    | Channel 3 Receiver Non-Inverted Data Output   |
| 15  | Rx3n    | Channel 3 Receiver Inverted Data Output       |
| 16  | GND     | Ground  |
| 17  | Rx1p    | Channel 1 Receiver Non-Inverted Data Output   |
| 18  | Rx1n    | Channel 1 Receiver Inverted Data Output       |
| 19  | GND     | Ground  |
| 20  | GND     | Ground  |
| 21  | Rx2n    | Channel 2 Receiver Inverted Data Output       |
| 22  | Rx2p    | Channel 2 Receiver Non-Inverted Data Output   |
| 23  | GND     | Ground  |
| 24  | Rx4n    | Channel 4 Receiver Inverted Data Output       |
| 25  | Rx4p    | Channel 4 Receiver Non-Inverted Data Output   |
| 26  | GND     | Ground  |
| 27  | ModPrsL | Module Present                                |
| 28  | IntL    | Interrupt                                     |
| 29  | Vcc Tx  | +3.3 V Power supply transmitter               |
| 30  | Vcc1    | +3.3 V Power Supply                           |
| 31  | LPMODE  | Low Power Mode                                |
| 32  | GND     | Ground  |
| 33  | Tx3p    | Channel 3 Transmitter Non-Inverted Data Input |
| 34  | Tx3n    | Channel 3 Transmitter Inverted Data Input     |
| 35  | GND     | Ground  |

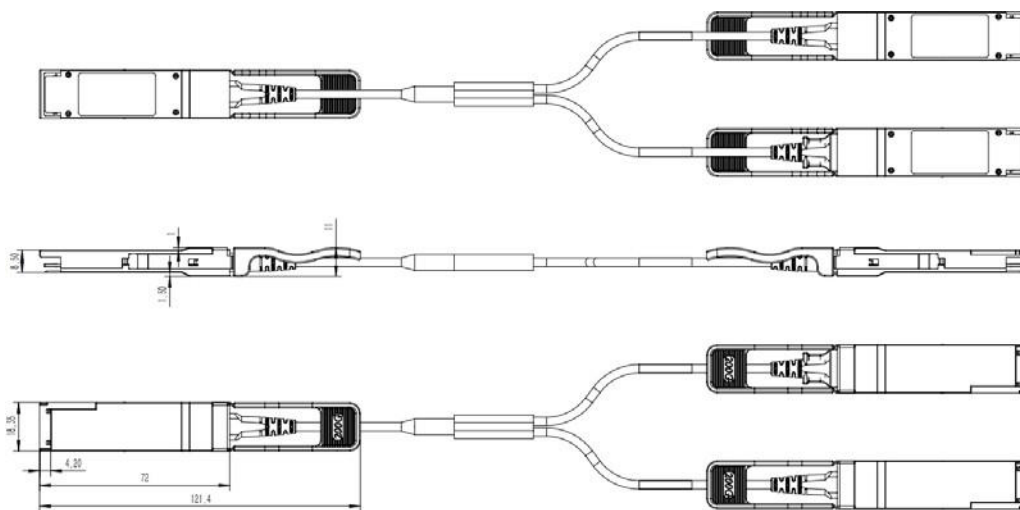
|    |      |   |
|----|------|---|
| 36 | Tx1p | Channel 1 Transmitter Non-Inverted Data Input |
| 37 | Tx1n | Channel 1 Transmitter Inverted Data Input     |
| 38 | GND  | Ground  |

## Module Memory Map

Compatible with CMIS rev 4.0/ SFF8636

## Package Outline

The mechanical specifications are based on QSFP56 transceiver module specification, substituting the optical connectors with a cable connecting three ends.



## Cable Breakout point

| Total Length (m) | Breakout * 2*100G (m) |
|------------------|-----------------------|
| 1                | 0.5                   |
| 2                | 0.5                   |
| 3                | 1                     |
| 5                | 2                     |
| 7                | 3                     |
| X (X≥10)         | 3                     |

**Standard Cable lengths for each PN**

| <b>Part Number</b> | <b>Description</b>                                  |
|--------------------|---|
| LQ-AOC12200-1M     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 1M  |
| LQ-AOC12200-3M     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 3M  |
| LQ-AOC12200-5M     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 5M  |
| LQ-AOC12200-7M     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 7M  |
| LQ-AOC12200-10     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 10M |
| LQ-AOC12200-15     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 15M |
| LQ-AOC12200-20     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 20M |
| LQ-AOC12200-30     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 30M |
| LQ-AOC12200-40     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 40M |
| LQ-AOC12200-50     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 50M |
| LQ-AOC12200-xx     | 200G QSFP56 SR4 AOC FanOut To 2*100G QSFP56 SR2 xxM |