

## TSQSQ-85L-XXXCB Active Optical Cable

### 200GBASE-SR4 HDR QSFP56 Active Optical Cable, With Diagnostic Monitoring

#### Features

- Hot-pluggable QSFP56 form factor
- 4 channels full-duplex transceiver modules
- Transmission data rate up to 53Gbps per channel
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Low power consumption < 5.5W per end
- Post FEC Bit Error Rate (BER) better than 1E-15
- Built-in digital diagnostic functions
- Operating case temperature: 0°C~+70°C
- RoHS6 compliant (lead free)

#### Applications

- InfiniBand HDR

#### Product Description

The TSQSQ-85L-XXXCB is a Four-Channels, Pluggable, Parallel, Fiber-Optic QSFP56 for InfiniBand HDR Applications. This transceiver is a high performance module for short-range multi-lane data communication and interconnection applications. It integrates four data lanes in each direction.

#### Absolute Maximum Rating

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

| Parameters                     | Symbol | Min. | Max. | Unit |
|--------------------------------|--------|------|------|------|
| Power Supply Voltage           | VCC    | -0.5 | +3.6 | V    |
| Storage Temperature            | Tc     | -40  | +85  | °C   |
| Relative Humidity <sup>1</sup> | RH     | 15   | 85   | %    |

**Notes:**

1. Non-condensing

## Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

| Parameter                  | Symbol | Min  | Typical | Max  | Unit |
|----------------------------|--------|------|---------|------|------|
| Supply Voltage             | VCC    | 3.15 | 3.30    | 3.45 | V    |
| Case Operating Temperature | Tca    | 0    | -       | 70   | °C   |

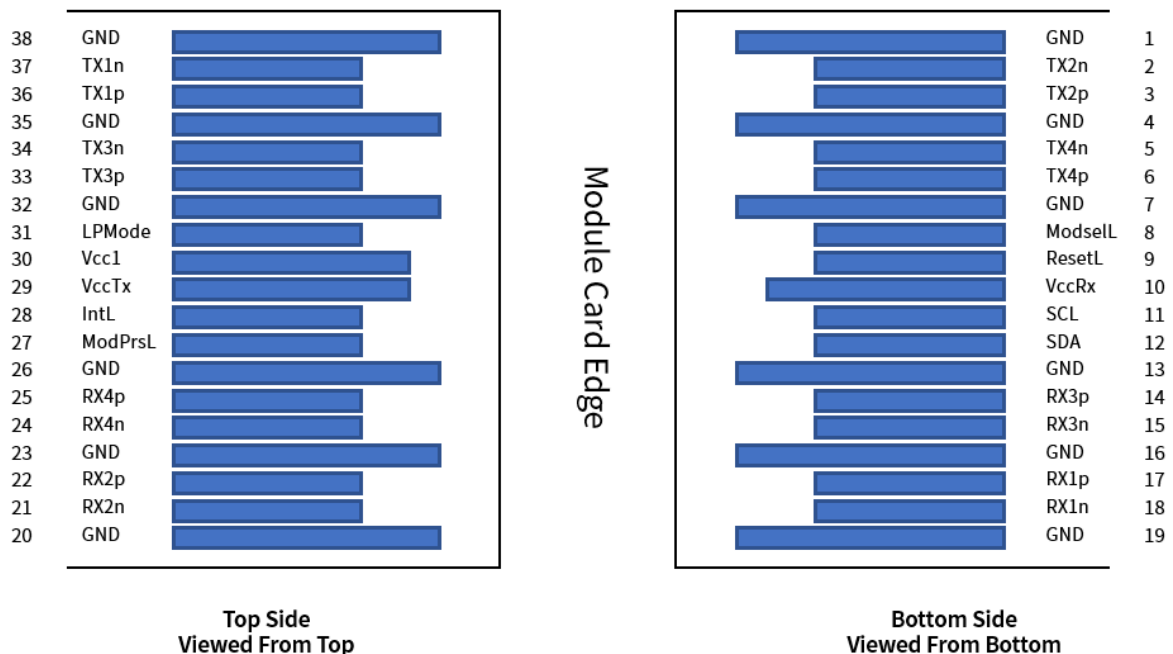
## Electrical characteristics

| Parameter                                          | Symbol | Min     | Typical | Max  | Unit |
|----------------------------------------------------|--------|---------|---------|------|------|
| Signaling rate per lane                            | -      | 53.125  |         |      | Gbps |
| Differential Input Voltage Amplitude <sup>1</sup>  | Vin    | 300     | -       | 1100 | mV   |
| Differential Output Voltage Amplitude <sup>2</sup> | Vout   | 300     | -       | 900  | mV   |
| Input Logic Level High                             | VIH    | 2.0     | -       | VCC  | V    |
| Input Logic Level Low                              | VIL    | 0       | -       | 0.8  | V    |
| Output Logic Level High                            | VOH    | VCC-0.5 | -       | VCC  | V    |
| Output Logic Level Low                             | VOL    | 0       | -       | 0.4  | V    |

### Notes:

1. Differential input voltage amplitude is measured between TxnP and TxnN
2. Differential output voltage amplitude is measured between RxnP and RxnN

## QSFP56 Transceiver Electrical Pad Layout



## Pin Definition

| Pin | Symbol  | Name/Description                    |
|-----|---------|-------------------------------------|
| 1   | GND     | Ground                              |
| 2   | Tx2n    | Transmitter Inverted Data Input     |
| 3   | Tx2p    | Transmitter Non-Inverted Data Input |
| 4   | GND     | Ground                              |
| 5   | Tx4n    | Transmitter Inverted Data Input     |
| 6   | Tx4p    | 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    | Receiver Non-Inverted Data Output   |
| 15  | Rx3n    | Receiver Inverted Data Output       |
| 16  | GND     | Ground                              |
| 17  | Rx1p    | Receiver Non-Inverted Data Output   |
| 18  | Rx1n    | Receiver Inverted Data Output       |
| 19  | GND     | Ground                              |
| 20  | GND     | Ground                              |
| 21  | Rx2n    | Receiver Inverted Data Output       |
| 22  | Rx2p    | Receiver Non-Inverted Data Output   |
| 23  | GND     | Ground                              |
| 24  | Rx4n    | Receiver Inverted Data Output       |
| 25  | Rx4p    | 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    | Transmitter Non-Inverted Data Input |
| 34  | Tx3n    | Transmitter Inverted Data Input     |
| 35  | GND     | Ground                              |
| 36  | Tx1p    | Transmitter Non-Inverted Data Input |
| 37  | Tx1n    | Transmitter Inverted Data Input     |

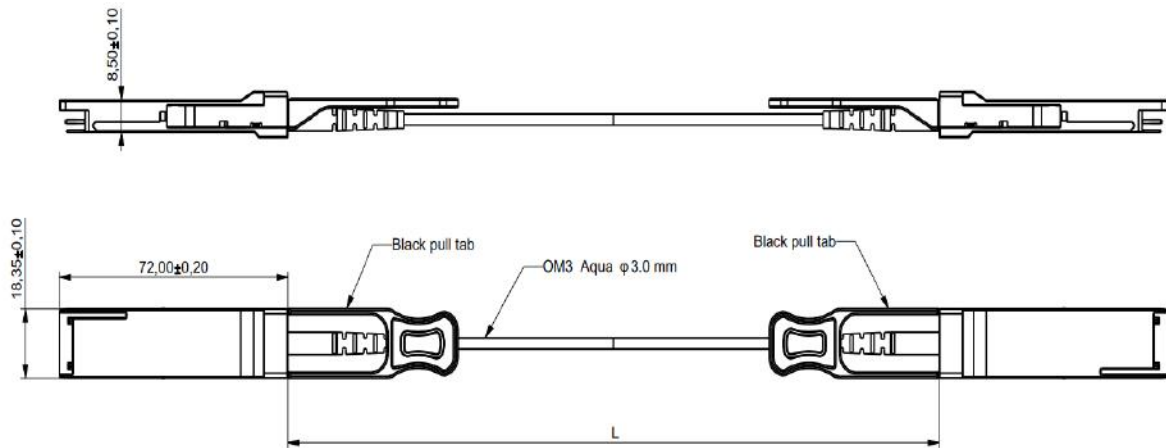
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|    |     |        |
|----|-----|--------|
| 38 | GND | Ground |
|----|-----|--------|

## Mechanical



Unit: mm

AOC product bagging circle size:

| L          | Disc fiber diameter (mm)               | number of circle |
|------------|----------------------------------------|------------------|
| 0.5m       | Based on actual circling               | 1.5              |
| 1m         |                                        | 3.5              |
| 1.5m       | 90≤Inner diameter, outer diameter≤110  | 4.5              |
| 2m         | 100≤Inner diameter, outer diameter≤120 | 5.5              |
| 2.5m       | 110≤Inner diameter, outer diameter≤130 | 6.5              |
| 3m         | 100≤Inner diameter, outer diameter≤120 | 8.5              |
| 3m<L≤5m    | 110≤Inner diameter, outer diameter≤160 | Not required     |
| 5m<L≤7m    | 110≤Inner diameter, outer diameter≤170 |                  |
| 7m<L≤30m   | 110≤Inner diameter, outer diameter≤180 |                  |
| 30m<L≤50m  | 110≤Inner diameter, outer diameter≤210 |                  |
| 50m<L≤100m | 110≤Inner diameter, outer diameter≤250 |                  |

Length tolerance table:

| L         | Tolerance (mm) |
|-----------|----------------|
| L≤1 M     | +70/-0         |
| 1 M<L<7 M | +100/-0        |
| L≥7 M     | +2%L/-0        |

## Ordering Information

| Part Number        | Product Description                     |
|--------------------|-----------------------------------------|
| TSQSQ-85L-XXXCB-01 | 200G HDR QSFP56 SR4 CDR AOC 0°C ~ +70°C |
| TSQSQ-85L-XXXCB-02 | 200G HDR QSFP56 SR4 DSP AOC 0°C ~ +70°C |

XXX:001~070,1~70 Length in meters on OM3 MMF

XXX:001~100,1~100 Length in meters on OM4 MMF

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