



## DAOQQM15D00FGMW

Mellanox® MFS1S50-H015V Compatible 200G-AOC QSFP56 to 2xQSFP56 Infiniband HDR Active Optical Cable (850nm, MMF, 15m, LSZH)

### Product Description

This is a Mellanox® MFS1S50-H010V compatible 200GBase-AOC QSFP56 to 2xQSFP56 active optical cable that operates over multi-mode fiber with a maximum reach of 15.0m (49.2ft). 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 built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

### Features:

- 200G QSFP56 Breakout to 2x 100G QSFP56 (Half-populated)
- Multi-rate capability: Up to 53.125Gbps PAM4 or 26.5625Gbps NRZ Per Channel
- Four-Channel Parallel Active Optical Cable
- Single 3.3V Power Supply
- 4x50G PAM4 Retimed 200GAUI-4 Electrical Interface (Half-populated on the 100G Ends)
- Low Power Dissipation: 4.5W per Cable End
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius



### Applications:

- 200GBase Ethernet
- InfiniBand HDR

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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## General Specifications

| Parameter                          | Symbol | Min              | Typ.  | Max.             | Unit | Notes |
|------------------------------------|--------|------------------|-------|------------------|------|-------|
| Storage Temperature                | Tstg   | -40              |       | 85               | °C   | 1     |
| Operating Case Temperature         | Tc     | 0                |       | 70               | °C   |       |
| Supply Voltage                     | Vcc    | -0.5             |       | 4.0              | V    |       |
| Relative Humidity (Non-Condensing) |        | 15               |       | 85               | %    |       |
| Aggregate Data Rate                |        |                  | 212.5 |                  | Gbps |       |
| Pre-FEC Bit Error Ratio            | BER    |                  |       | 10 <sup>-6</sup> |      | 2     |
| Maximum Power Consumption per End  |        |                  |       | 5 (Retimed Tx)   | W    | 3     |
| Data Rate Per Lane                 | DR     | 26.5625 ± 100ppm |       |                  | Gbd  | 4     |

### Notes:

1. Assumes no mechanical load force on the unit. Ensuring no mechanical load force requires a cable bend radius of >70 mm on the rest of the cable.
2. Tested with a PRBS 2<sup>31</sup>-1 test pattern.
3. Maximum total power value is specified across the full temperature and voltage range.
4. Supports InfiniBand HDR.

## Electrical Specifications

| Parameter                                    | Symbol | Min               | Typ. | Max.  | Unit | Notes |
|----------------------------------------------|--------|-------------------|------|-------|------|-------|
| Supply Voltage                               | Vcc    | 3.135             | 3.3  | 3.465 | V    |       |
| Supply Current                               | Icc    |                   |      | 1.59  | A    |       |
| Power Consumption                            | P      |                   |      | 4.5   | W    | 1     |
| <b>Transmitter</b>                           |        |                   |      |       |      |       |
| AC Common Mode Input Voltage Tolerance (RMS) |        |                   |      | 20    | mV   |       |
| Differential Input Return Loss               |        | Equation 27 Below |      |       | dB   | 2     |
| Differential to Common Mode Reflection       |        | Equation 28 Below |      |       | dB   | 2     |
| Eye Hight Tolerance, with Tx CDR enabled     |        |                   |      | 32    | mV   | 3     |
| Eye Width Tolerance, with Tx CDR enabled     |        |                   |      | 0.2   | UI   | 3     |
| DC Common Mode Input Voltage Tolerance       |        | -350              |      | 2850  | mV   | 4     |
| <b>Receiver</b>                              |        |                   |      |       |      |       |
| Bit Error Rate                               |        |                   |      | 9E-6  |      |       |
| AC Common-mode Output Voltage (RMS)          |        |                   |      | 20    | mV   |       |
| Differential Unsigned Output Voltage         |        | 450               |      |       | mV   | 5     |
| Near-end Eye Symmetry Mask Width             |        | 0.265             |      |       | UI   | 6     |
| Near-end Differential Eye Height             |        | 70                |      |       | mV   |       |
| Far-end Eye Symmetry Mask Width              |        | 0.2               |      |       | UI   |       |

|                                        |  |                   |  |      |    |   |
|----------------------------------------|--|-------------------|--|------|----|---|
| Far-end Differential Eye Height        |  | 30                |  |      | mV |   |
| Far-end Pre-cursor ISI Ratio           |  | -7                |  | 4    | %  |   |
| Common Mode Output Return Loss         |  | -2                |  |      | dB |   |
| Differential Output Return Loss        |  | Equation 27 Below |  |      | dB |   |
| Common Mode to Differential Reflection |  | Equation 28 Below |  |      | dB |   |
| Differential Termination Mismatch      |  |                   |  | 10   | %  |   |
| Transition Time (20% to 80%)           |  | 9.5               |  |      | ps | 7 |
| DC Common Mode Voltage (minimum)       |  | -350              |  | 2850 | mV | 4 |

#### Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. Ref: InfiniBand Architecture Specification Volume 2 Release 1.4.
3. Ref: CEI-04 16.3.10.3.1.2.
4. Referred to Signal Ground.
5. Hit Ratio=5E-5 with 100Ω load.
6. Ref: 802.3 120E.4.2.
7. PRBS13Q, see 120E.3.1.5 for positions in the pattern.

#### Equation 27

$$(S_{DDxx}(f)) \leq \begin{pmatrix} -11, 0.05 \leq f < 26.5625/7.5 \\ -6.0 + 9.2 \cdot \log_{10}\left(\frac{15 \cdot f}{7 \cdot 26.5625}\right), 26.5625/7.5 \leq f \leq 26.5 \end{pmatrix}$$

#### Equation 28

$$(S_{CD11}, S_{DC22}(f)) \leq \begin{pmatrix} -25 + 20\left(\frac{f}{26.5625}\right), 0.05 \leq f < 26.5625/2 \\ -18 + 6\left(\frac{f}{26.5625}\right), 26.5625/2 \leq f < 26.5 \end{pmatrix}$$

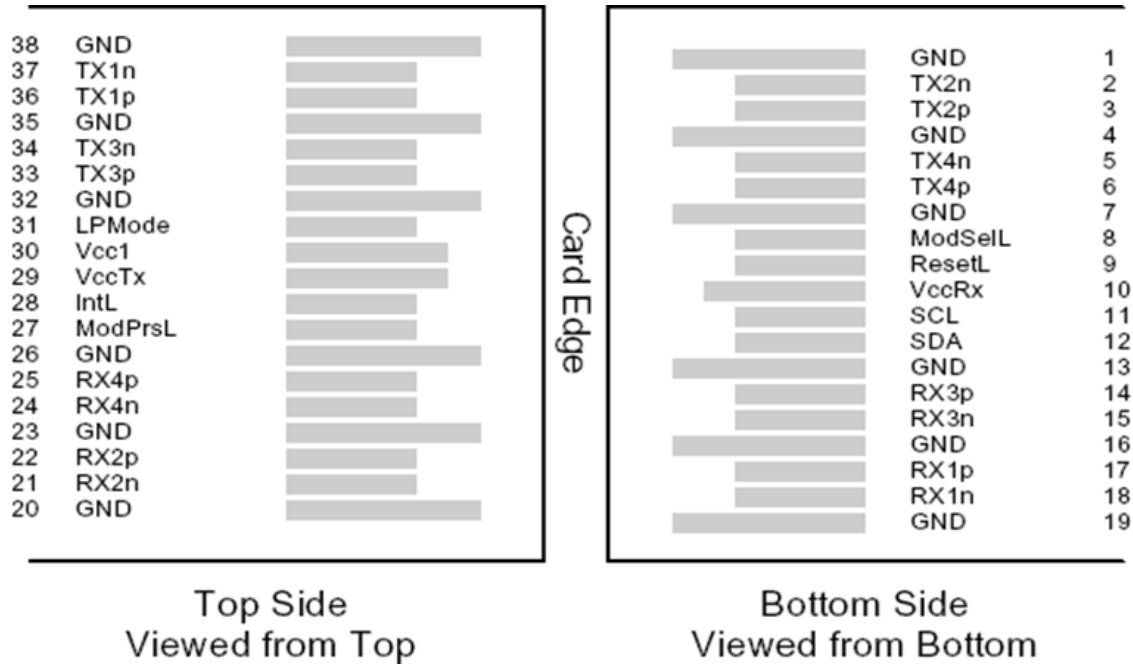
## Pin Descriptions

| Pin | Symbol  | Name/Description                     | Notes |
|-----|---------|--------------------------------------|-------|
| 1   | GND     | Module Ground.                       | 1     |
| 2   | Tx2-    | Transmitter Inverted Data Input.     |       |
| 3   | Tx2+    | Transmitter Non-Inverted Data Input. |       |
| 4   | GND     | Module Ground.                       | 1     |
| 5   | Tx4-    | Transmitter Inverted Data Input.     |       |
| 6   | Tx4+    | Transmitter Non-Inverted Data Input. |       |
| 7   | GND     | Module Ground.                       | 1     |
| 8   | ModSelL | Module Select.                       |       |
| 9   | ResetL  | Module Reset.                        |       |
| 10  | VccRx   | +3.3V Receiver Power Supply.         |       |
| 11  | SCL     | 2-Wire Serial Interface Clock.       |       |
| 12  | SDA     | 2-Wire Serial Interface Data.        |       |
| 13  | GND     | Module Ground.                       | 1     |
| 14  | Rx3+    | Receiver Non-Inverted Data Output.   |       |
| 15  | Rx3-    | Receiver Inverted Data Output.       |       |
| 16  | GND     | Module Ground.                       | 1     |
| 17  | Rx1+    | Receiver Non-Inverted Data Output.   |       |
| 18  | Rx1-    | Receiver Inverted Data Output.       |       |
| 19  | GND     | Module Ground.                       | 1     |
| 20  | GND     | Module Ground.                       | 1     |
| 21  | Rx2-    | Receiver Inverted Data Output.       |       |
| 22  | Rx2+    | Receiver Non-Inverted Data Output.   |       |
| 23  | GND     | Module Ground.                       | 1     |
| 24  | Rx4-    | Receiver Inverted Data Output.       |       |
| 25  | Rx4+    | Receiver Non-Inverted Data Output.   |       |
| 26  | GND     | Module Ground.                       | 1     |
| 27  | ModPrsL | Module Present.                      |       |
| 28  | IntL    | Interrupt.                           |       |
| 29  | VccTx   | +3.3V Transmitter Power Supply.      |       |
| 30  | Vcc1    | +3.3V Power Supply.                  |       |
| 31  | LPMODE  | Low-Power Mode.                      |       |
| 32  | GND     | Module Ground.                       | 1     |
| 33  | Tx3+    | Transmitter Non-Inverted Data Input. |       |
| 34  | Tx3-    | Transmitter Inverted Data Input.     |       |
| 35  | GND     | Module Ground.                       | 1     |

|           |      |                                      |   |
|-----------|------|--------------------------------------|---|
| <b>36</b> | Tx1+ | Transmitter Non-Inverted Data Input. |   |
| <b>37</b> | Tx1- | Transmitter Inverted Data Input.     |   |
| <b>38</b> | GND  | Module Ground.                       | 1 |

**Notes:**

1. Circuit ground is internally isolated from chassis ground.



Mechanical Specifications



Active Optical Cable Dimensions

| Mark "C" | Fiber      | Mark "A" | Mark "B" |
|----------|------------|----------|----------|
| RX1      | 8          | TX1      | TX3      |
| RX2      | 7          | TX2      | TX4      |
| RX3      | 6          | -        | -        |
| RX4      | 5          | -        | -        |
| -        | Fake Fiber | -        | -        |
| -        | Fake Fiber | -        | -        |
| -        | Fake Fiber | -        | -        |
| -        | Fake Fiber | -        | -        |
| TX4      | 4          | -        | -        |
| TX3      | 3          | -        | -        |
| TX2      | 2          | RX2      | RX4      |
| TX1      | 1          | RX1      | RX3      |

# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

