



Active Optical Cable QSFP28 100Gbps, 3m, Juniper® Compatible

Active Optical Cables Technical Data Sheet

AOCQP28100-003-JN

Features

- Full-Duplex 4 channel parallel active optical cable, supporting 100 Gbps links
- Up to 28 Gbps Data rate per channel
- Maximum link length of 10m available
- High Reliability 850 nm VCSEL technology
- Electrical interface compliant to SFF-8636 MSA
- Case Operating temperature range: 0°C to 70°C
- Power dissipation < 2.5W per cable end

Applications

- 100G Ethernet Data Center Intra-Rack and Inter-Rack links
- Infiniband QDR
- HPC Interconnections

Description

The AOCQP28100-003-JN is an active optical cable designed for use in 100Gigabit Ethernet links. They are electrically compliant and mechanically compliant with the QSFP28 MSA. The AOCQP28100-003-JN allows for greater link length than direct attach cables, with a lower total power consumption than transceiver solutions.

QSFP28+ Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------|--------|---------|------|---------|------|------|
| Storage Temperature | Ts | -40 | - | 85 | °C | |
| Relative Humidity | RH | 5 | - | 95 | % | |
| Power Supply Voltage | VCC | -0.3 | - | 4 | V | |
| Signal Input Voltage | | Vcc-0.3 | - | Vcc+0.3 | V | |

QSFP28+ Recommended Operating Conditions

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------------|--------|------|----------|------|------|------------------|
| Case Operating Temperature | Tcase | 0 | - | 70 | °C | Without air flow |
| Power Supply Voltage | VCC | 3.14 | 3.3 | 3.46 | V | |
| Power Supply Current | ICC | - | | 750 | mA | per cable end |
| Data Rate | BR | | 25.78125 | | Gbps | Each channel |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [Active Optical Cable QSFP28 100Gbps, 3m, Juniper® Compatible AOCQP28100-003-JN](#)



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QSFP28+ General Product Characteristics

| Parameter | Value | Unit | Notes |
|-----------------------------------|---|--------|--------------------------------------|
| Module Form Factor | QSFP28 | | |
| Number of Lanes | 4 Tx /Rx | | |
| Maximum Aggregate Data Rate | 111.8 | Gb/s | |
| Maximum Data Rate per Lane | 27.952 | Gb/s | |
| Standard Cable Lengths | 3, 5, 7, 10 | meters | Other lengths, please contact sales |
| Protocols Supported | Typical applications include Infiniband, Fiber Channel, 100G Ethernet | | |
| Electrical Interface and Pin-out | 38-pin edge connector | | Pin-out as defined by the QSFP28 MSA |
| Standard Optical Cable Type | Multimode ribbon fiber cable assembly, riser-rated | | |
| Maximum Power Consumption per End | 2.5 | W | |
| Management Interface | Serial, I2C-based, 400 kHz maximum frequency | | As defined by the QSFP28 MSA |

Note: 100G Ethernet & 100GBASE-SR4 and ITU-T OTU4 has different register setting , not auto-Negotiation

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QSFP28+ High-speed Electrical Characteristics per Lane

| Parameter-Inputs | Symbol | Min | Typ | Max | Unit | NOTE |
|---|--------------|---|-----|------|------|------|
| Input electrical specifications (per Lane) | | | | | | |
| Differential Voltage pk-pk | | | | 900 | mV | |
| Common Mode Noise RMS | | | | 17.5 | mV | |
| Differential Termination Resistance Mismatch | | | | 10 | % | |
| Differential Return Loss | SDD22 | Per OIF CEI-28G-VSR and CAUI-4 requirements | | | | |
| Common Mode to Differential conversion and Differential to Common Mode Conversion | SDC22, SCD22 | | | | | |
| | | | | | | |
| Common Mode Return Loss | SCC22 | | | | | |
| Transition Time, 20 to 80% | Tr, Tf | 10 | | | ps | |
| Common Mode Voltage | Vcm | -0.3 | | 2.8 | V | |
| Eye Width at 1E-15 probability | EW15 | 0.46 | | | UI | |
| Eye Height at 1E-15 probability | EH15 | 94 | | | mV | |

QSFP28+ High-speed Electrical Characteristics per Lane

| | | | | | | |
|---|--------------|---|--|------|----|--|
| Output electrical specifications (per Lane) | | | | | | |
| Differential Voltage pk-pk | | | | 900 | mV | |
| Common Mode Voltage | Vcm | -350 | | 2850 | mV | |
| Common Mode Noise RMS | | | | 17.5 | mV | |
| Differential Termination Resistance Mismatch | | | | 10 | % | |
| Differential Return Loss | SDD22 | Per OIF CEI-28G-VSR and CAUI-4 requirements | | | | |
| Common Mode to Differential conversion and Differential to Common Mode Conversion | SDC22, SCD22 | | | | | |
| | | | | | | |
| Common Mode Return Loss | SCC22 | | | | | |
| Output Rise and Fall time (20% to 80%) | tRH, tFH | 9.5 | | | ps | |
| Vertical Eye Closure | VEC | | | 5.5 | dB | |
| Eye Width at 1E-15 probability | EW15 | 0.57 | | | UI | |

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Mechanical Specifications

Length 118.11 in [300 cm]

Environmental Specifications

QSFP28

Temperature (Operational) +0C to +70C

Temperature (Storage) -40C to +85C

Relative Humidity 5% to 95%

Compliance Certifications

RoHS Compliant Yes

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Our portfolio includes cable assemblies, connectors, adapters and custom products, as well as their wireless product line which includes antennas, RF amplifiers, coaxial lightning and surge protectors, and NEMA rated enclosures.

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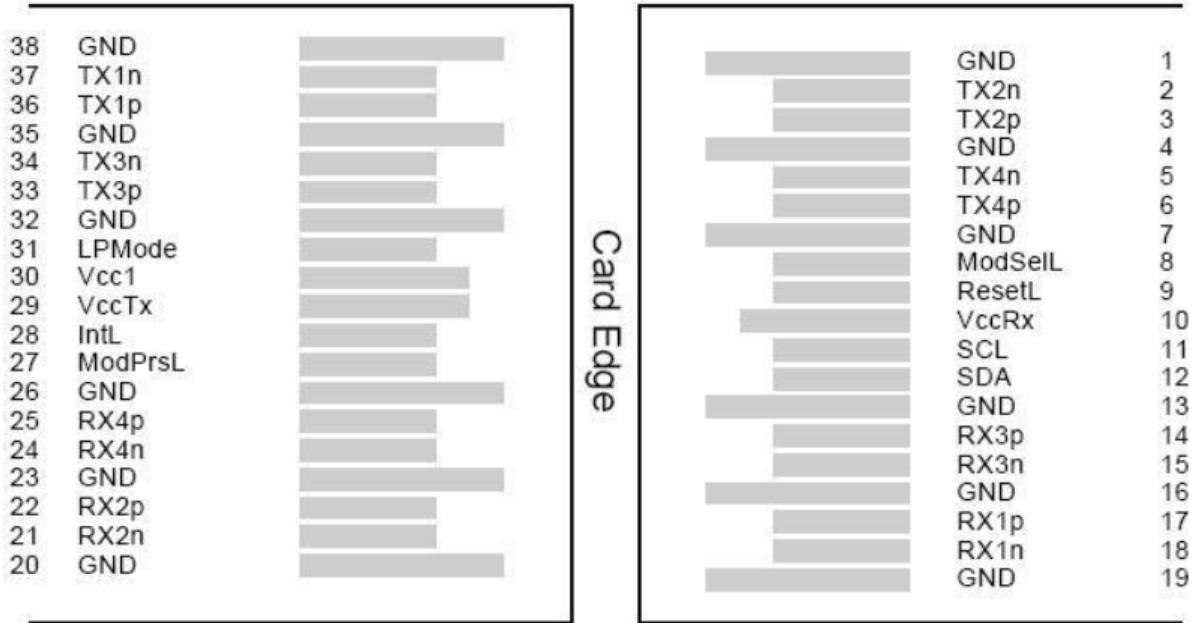


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QSFP28+ Pin Assignment



Top Side

Bottom Side

Pin out of Connector Block on Host Board

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QSFP28+ Pin Assignment Table

| Pin | Symbol | Name/Description | NOTE |
|-----|---------|--|------|
| 1 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | Tx2n | Transmitter Inverted Data Input | |
| 3 | Tx2p | Transmitter Non-Inverted Data output | |
| 4 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 5 | Tx4n | Transmitter Inverted Data Input | |
| 6 | Tx4p | Transmitter Non-Inverted Data output | |
| 7 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 8 | ModSelL | Module Select | |
| 9 | ResetL | Module Reset | |
| 10 | VccRx | 3.3V Power Supply Receiver | 2 |
| 11 | SCL | 2-Wire serial Interface Clock | |
| 12 | SDA | 2-Wire serial Interface Data | |
| 13 | GND | Transmitter Ground (Common with Receiver Ground) | |
| 14 | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | Rx3n | Receiver Inverted Data Output | |
| 16 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 17 | Rx1p | Receiver Non-Inverted Data Output | |
| 18 | Rx1n | Receiver Inverted Data Output | |
| 19 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 20 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 21 | Rx2n | Receiver Inverted Data Output | |
| 22 | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 24 | Rx4n | Receiver Inverted Data Output | 1 |
| 25 | Rx4p | Receiver Non-Inverted Data Output | |
| 26 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 27 | ModPrsl | Module Present | |
| 28 | IntL | Interrupt | |
| 29 | VccTx | 3.3V power supply transmitter | 2 |
| 30 | Vcc1 | 3.3V power supply | 2 |
| 31 | LPMODE | Low Power Mode, not connect | |
| 32 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 33 | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | Tx3n | Transmitter Inverted Data Output | |
| 35 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| 36 | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | Tx1n | Transmitter Inverted Data Output | |
| 38 | GND | Transmitter Ground (Common with Receiver Ground) | 1 |

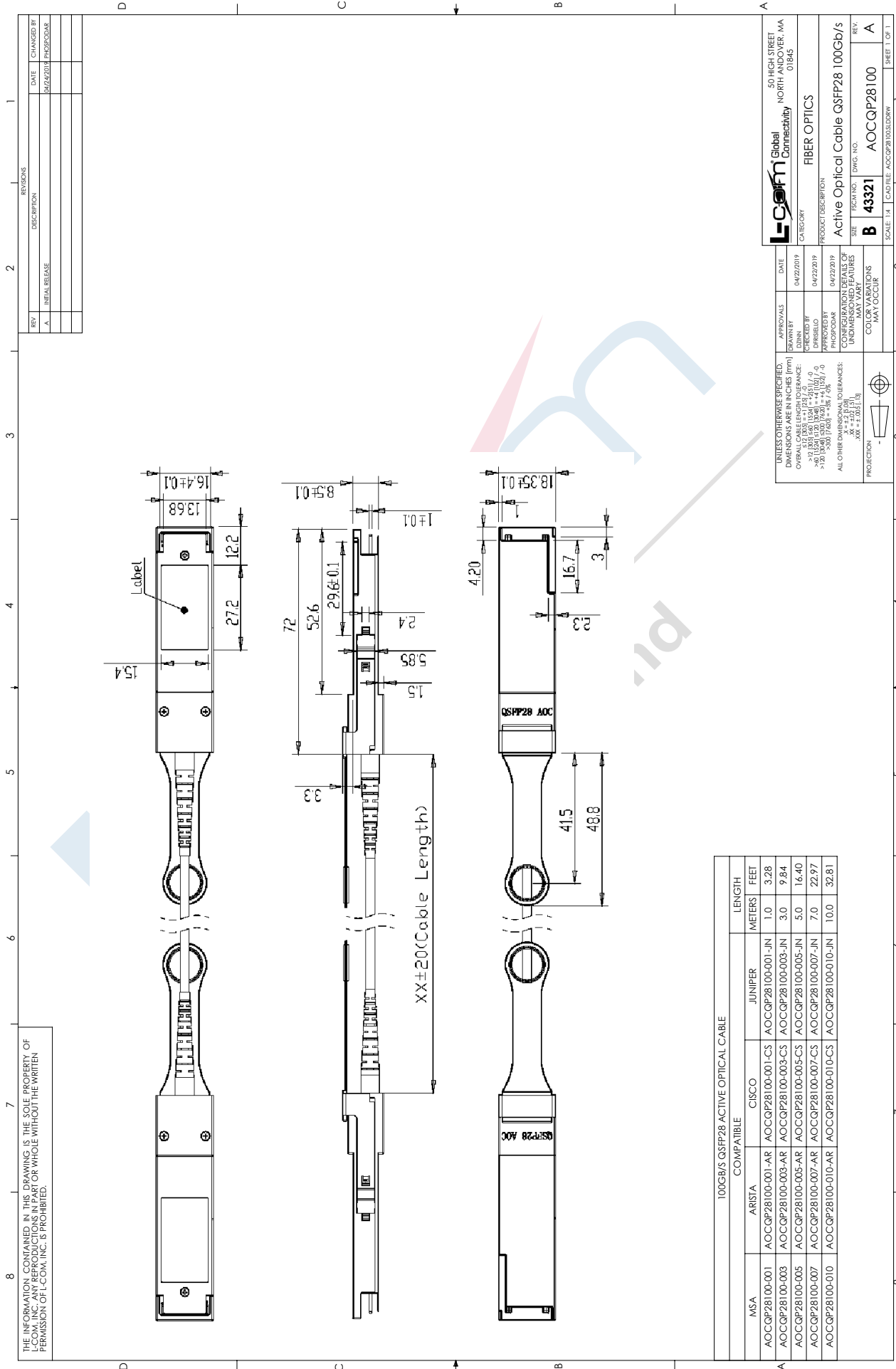
Notes:

1. GND is the symbol for signal and supply (power) common for QSFP+ modules. 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. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

AOCQP28100-003-JN CAD Drawing

Active Optical Cable QSFP28 100Gbps, 3m, Juniper® Compatible



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| REV | INITIAL RELEASE | DESCRIPTION | DATE | CHANGED BY |
|-----|-----------------|-------------|------------|------------|
| A | | | 03/24/2019 | PHOSKODAR |

| | | |
|--|--|--|
| | | 50 HIGH STREET NORTH ANDOVER, MA 01845 |
| CATEGORY: FIBER OPTICS | | PRODUCT DESCRIPTION: Active Optical Cable QSFP28 100Gb/s |
| DATE: 04/22/2019 | APPROVALS: | DWG. NO: B 43321 |
| DRAWN BY: JDBIN | CHECKED BY: PHOSKODAR | REV: A |
| DATE: 04/22/2019 | CONFIGURATION DETAILS OF UNUSUAL FEATURES MAY VARY | COLOR VARIATIONS MAY OCCUR |
| UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES (MM) | | SCALE: 1:1 |
| OVERALL LENGTH TOLERANCE: ±0.005 (0.127) | | SHEET 1 OF 1 |
| HOLE POSITION TOLERANCE: ±0.005 (0.127) | | CAPFILE: AOCQP2810003.DWG |
| HOLE SIZE TOLERANCE: +0.001 (0.025) / -0.001 (0.025) | | |
| ALL OTHER DIMENSIONAL TOLERANCES: X = ±0.008 (0.203) Y = ±0.005 (0.127) Z = ±0.010 (0.254) | | |

| 100GB/S QSFP28 ACTIVE OPTICAL CABLE | | | | LENGTH | |
|-------------------------------------|-------------------|-------------------|-------------------|--------|-------|
| MSA | COMPATIBLE | CISCO | JUNIPER | METERS | FEET |
| AOCQP28100-001 | AOCQP28100-001-AR | AOCQP28100-001-CS | AOCQP28100-001-JN | 1.0 | 3.28 |
| AOCQP28100-003 | AOCQP28100-003-AR | AOCQP28100-003-CS | AOCQP28100-003-JN | 3.0 | 9.84 |
| AOCQP28100-005 | AOCQP28100-005-AR | AOCQP28100-005-CS | AOCQP28100-005-JN | 5.0 | 16.40 |
| AOCQP28100-007 | AOCQP28100-007-AR | AOCQP28100-007-CS | AOCQP28100-007-JN | 7.0 | 22.97 |
| AOCQP28100-010 | AOCQP28100-010-AR | AOCQP28100-010-CS | AOCQP28100-010-JN | 10.0 | 32.81 |