

400Gb/s Twin-port OSFP to 4x100G QSFP56 HDR100 Passive Copper Splitter Cable

Features

- 400Gb/s to four 100Gb/s data rates
- Based on 2-channel 50G-PAM4 modulation
- Compatible with IEEE 802.3cd
- Operating case temperature 0-70°C
- Single 3.3V supply voltage
- Hot pluggable
- RoHS compliant
- Optimized construction to minimize insertion loss and crosstalk
- Customized cable braid termination limits EMI radiation
- Customizable EEPROM mapping for cable signature
- CMIS Rev 4.0: Common Management Interface Specification
- SFF8665/ SFF8636

Applications

- 2x200G 2xHDR InfiniBand Quantum-2 or Spectrum-4 Ethernet switch-to-four 100Gb/s switches, ConnectX-6/7, and/or BlueField-2/3 DPUs

Description

O4Q56-400G-DACH is a passive Direct Attach Copper (DAC) cable with an OSFP-based twin-port 2x 200Gb/s connector to four QSFP56s. DAC cables are the lowest-cost, lowest-latency, near zero power consuming, high-speed links available due to their simplicity of design and minimal components. Main use is linking Quantum-2 NDR InfiniBand switches to HDR100 switches, ConnectX-6/7 adapters, and/or BlueField-2/3 DPUs.

NADDOD's cable solutions provide power-efficient connectivity enabling higher port bandwidth, density and configurability at a low cost and reduced power requirement in the data centers. Rigorous cable production testing ensures best out-of-the-box installation experience, performance, and durability.

Absolute Maximum Specifications

Absolute maximum ratings are those beyond which damage to the device may occur.

Between the operational specifications and absolute maximum ratings, prolonged operation is not intended and permanent device degradation may occur.

| Table1-Absolute Maximum Specifications | | | |
|--|------|------|------|
| Parameter | Min. | Max. | Unit |
| Supply voltage | -0.3 | 3.6 | V |
| Data input voltage | -0.3 | 3.6 | V |
| Control input voltage | -0.3 | 3.6 | V |

Operational Specifications

This section shows the range of values for normal operation. The host board power supply filtering should be designed as recommended in the SFF Committee Spec.

| Table2-Optical Specifications | | | | |
|-------------------------------|-------|---------|-------|-------|
| Parameter | Min. | Typical | Max. | Units |
| Supply voltage (Vcc) | 3.135 | 3.3 | 3.465 | V |
| Power consumption | | | 0.1 | W |
| Operating case temperature | 0 | | 70 | °C |
| Storage Temperature | -40 | | 85 | °C |
| Operating relative humidity | 5 | | 85 | % |

Electrical Performance Requirements

| Table3-Electrical Performance Requirements | | | | |
|--|------------|---------------------------------------|------------------------------------|------|
| No | Test Items | Test Condition | Specification | Note |
| 1 | Current | | 0.5A per contact | |
| 2 | Voltage | | 30v DC per contact | |
| 3 | LLCR | EIA 364-23, 20mVdc, 100mA | less than 2 ohms | |
| 4 | Continuity | Verify the continuous electrical path | No open, short, or high resistance | |

SI Requirements

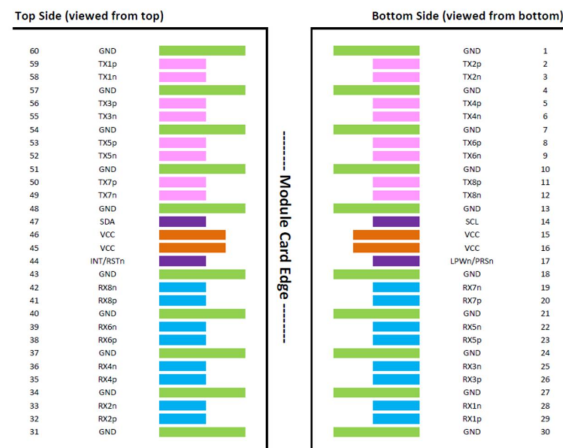
| Table4-High Speed Characteristics | | | |
|-----------------------------------|-------------|--|----------------------|
| No | Test Items | Specification | Notes |
| 1 | SDD21&SDD12 | -17.16 dB Min. @13.28 GHz | From 0.01 GHz- 19GHz |
| 2 | SDD11&SDD22 | <ul style="list-style-type: none"> -16.5+2*sqrt(f)dB Max. @0.05GHz~4.1GHz -10.66+14*log(f/5.5)dB Max.@4.1GHz~10GHz | From 0.01 GHz- 19GHz |
| 3 | SCD21-SDD21 | <ul style="list-style-type: none"> -10 dB Max. @0.01 GHz~12.89 GHz -27+(29/22)*f dB Max. 12.89 GHz~15.7 GHz -6.3 dB Max. @15.7 GHz 19 GHz | From 0.01 GHz- 19GHz |

Pin Description

| Table5-OSFP Pin Description | | | | | |
|-----------------------------|-------------|--------------------------------------|-----|------------|-------------------------------------|
| Pin | Symbol | Description | Pin | Symbol | Description |
| 1 | GND | Ground | 31 | GND | Ground |
| 2 | Tx2p | Transmitter Non-Inverted Data Input | 32 | Rx2p | Receiver Non-Inverted Data Output |
| 3 | Tx2n | Transmitter Inverted Data Input | 33 | Rx2n | Receiver Inverted Data Output |
| 4 | GND | Ground | 34 | GND | Grounds |
| 5 | Tx4p | Transmitter Non-Inverted Data Input | 35 | Rx4p | Receiver Non-Inverted Data Output |
| 6 | Tx4n | Transmitter Inverted Data Input | 36 | Rx4n | Receiver Inverted Data Output |
| 7 | GND | Ground | 37 | GND | Ground |
| 8 | Tx6p | Transmitter Non-Inverted Data Input | 38 | Rx6p | Receiver Non-Inverted Data Output |
| 9 | Tx6n | Transmitter Inverted Data Input | 39 | Rx6n | Receiver Inverted Data Output |
| 10 | GND | Ground | 40 | GND | Ground |
| 11 | Tx8p | Transmitter Non- Inverted Data input | 41 | Rx8p | Receiver Non-Inverted Data Output |
| 12 | Tx8n | Transmitter Inverted Data Input | 42 | Rx8n | Receiver Inverted Data Output |
| 13 | GND | Ground | 43 | GND | Ground |
| 14 | SCL | 2-wire serial interface clock | 44 | INT / RSTn | Module Interrupt / Module Reset |
| 15 | VCC | +3.3V Power | 45 | VCC | +3.3V Power |
| 16 | VCC | +3.3V Power | 46 | VCC | +3.3V Power |
| 17 | LPWn / PRSn | Low- Power Mode / Module Present | 47 | SDA | 2-wire Serial interface data |
| 18 | GND | Ground | 48 | GND | Ground |
| 19 | Rx7n | Receiver Inverted Data Output | 49 | Tx7n | Transmitter Inverted Data Input |
| 20 | Rx7p | Receiver Non-Inverted Data Output | 50 | Tx7p | Transmitter Non-Inverted Data Input |
| 21 | GND | Ground | 51 | GND | Ground |
| 22 | Rx5n | Receiver Inverted Data Output | 52 | Tx5n | Transmitter Inverted Data Input |
| 23 | Rx5p | Receiver Non-Inverted Data Output | 53 | Tx5p | Transmitter Non-Inverted Data Input |
| 24 | GND | Ground | 54 | GND | Ground |
| 25 | Rx3n | Receiver Inverted Data Output | 55 | Tx3n | Transmitter Inverted Data Input |

| | | | | | |
|----|------|-----------------------------------|----|------|-------------------------------------|
| 26 | Rx3p | Receiver Non-Inverted Data Output | 56 | Tx3p | Transmitter Non-Inverted Data Input |
| 27 | GND | Ground | 57 | GND | Ground |
| 28 | Rx1n | Receiver Inverted Data Output | 58 | Tx1n | Transmitter Inverted Data Input |
| 29 | Rx1p | Receiver Non-Inverted Data Output | 59 | Tx1p | Transmitter Non-Inverted Data Input |
| 30 | GND | Ground | 60 | GND | Ground |

OSFP Module Pad Layout

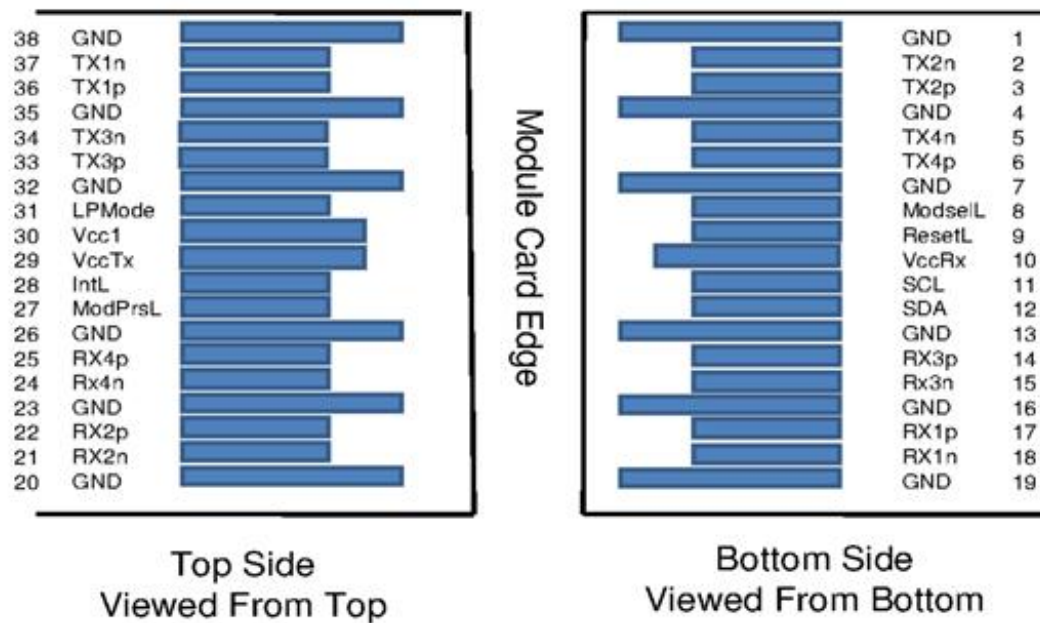


QSFP56 Pin Description

| Table6-QSFP56 Pin Description | | | | | |
|-------------------------------|----------|--|-----|---------|--|
| Pin | Symbol | Description | Pin | Symbol | Description |
| 1 | Ground | Ground | 20 | Ground | Ground |
| 2 | Tx2n | Connected to Port 1 lane Rx2 Inverted Data | 21 | Rx2n | Connected to Port 1 lane Tx2 Inverted Data |
| 3 | Tx2p | Connected to Port 1 lane Rx2 Non-Inverted Data | 22 | Rx2p | Connected to Port 1 lane Tx2 Non-Inverted Data |
| 4 | Ground | Ground | 23 | Ground | Grounds |
| 5 | Tx4n | Connected to Port 2 lane Rx2 Non-Inverted Data | 24 | Rx4n | Connected to Port 2 lane Tx2 Inverted Data |
| 6 | Tx4p | Connected to Port 2 lane Rx2 Inverted Data | 25 | Rx4p | Connected to Port 2 lane Tx2 Non-Inverted Data |
| 7 | Ground | Ground | 26 | Ground | Ground |
| 8 | Mod-SelL | Cable Select | 27 | ModPrsL | Cable Present |
| 9 | ResetL | Cable Reset | 28 | IntL | Interrupt |
| 10 | Vcc Rx | +3.3V Power supply receiver | 29 | Vcc Tx | +3.3V Power supply transmitter |
| 11 | SCL | 2-wire serial interface clock | 30 | Vcc1 | +3.3V Power Supply |
| 12 | SDA | 2-wire serial interface data | 31 | LPMODE | Low Power Mode |
| 13 | Ground | Ground | 32 | Ground | Ground |
| 14 | Rx3p | Connected to Port 2 lane Tx1 Non-Inverted Data | 33 | Tx3p | Connected to Port 2 lane Rx1 Non-Inverted Data |

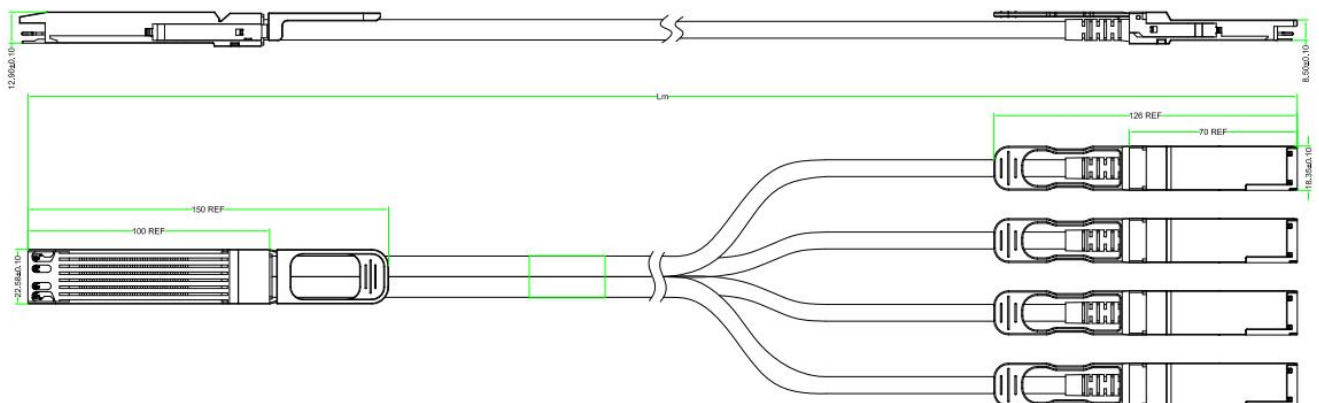
| | | | | | |
|----|--------|--|----|--------|--|
| 15 | Rx3n | Connected to Port 2 lane Tx1 Inverted Data | 34 | Tx3n | Connected to Port 2 lane Rx1 Inverted Data |
| 16 | Ground | Ground | 35 | Ground | Ground |
| 17 | Rx1p | Connected to Port 1 lane Tx1 Non-Inverted Data | 36 | Tx1p | Connected to Port 1 lane Rx1 Non-Inverted Data |
| 18 | Rx1n | Connected to Port 1 lane Tx1 Inverted Data | 37 | Tx1n | Connected to Port 1 lane Rx1 Inverted Data |
| 19 | Ground | Ground | 38 | Ground | Ground |

QSFP56 Module Pad Layout



Mechanical Specifications

The connector is compatible with the SFF8024 and SFF8672 specification.



| Length (m) | Cable AWG |
|------------|-----------|
| 0.5 | 30 |
| 1 | 30 |
| 2 | 28 |
| 3 | 28 |

Materials

Connector

- The PCB has gold plated pads
- All materials are RoHS complaint
- The PCBs are certified by UL

Cable

- The conductors are solid copper with silver plating
- The dielectric consist of (Skin - Foam - Skin PE)
- The cable jacket is polyvinylchloride (PVC) .
- All materials are RoHS complaint

Regulatory Compliance

| Table7-Regulatory Compliance | | |
|--|---|---|
| Feature | Test Method | Performance |
| Electrostatic Discharge (ESD) to the Electrical Pins | MIL-STD-883C Method 3015.7 | Class 1(>2000 Volts) |
| Electromagnetic Interference(EMI) | FCC Class B | Compliant with Standards |
| | CENELEC EN55022 Class B | |
| | CISPR22 ITE Class B | |
| RF Immunity(RFI) | IEC61000-4-3 | Typically Show no Measurable Effect from a 10V/m Field Swept from 80 to 1000MHz |
| RoHS Compliance | RoHS Directive 2011/65/EU and it's Amendment Directives (EU) 2015/863 | RoHS (EU) 2015/863 compliant |
| REACH Compliance | REACH Regulation (EC) No 1907/2006 | REACH (EC) No 1907/2006 compliant |

Ordering Information

| Table8-Ordering Information | |
|-----------------------------|---|
| PN | Description |
| 04Q56-400G-CUAH | passive copper splitter cable, 400Gb/s Twin-port 2x200G OSFP to 4x100G QSFP56, 0.5m |
| 04Q56-400G-CU1H | passive copper splitter cable, 400Gb/s Twin-port 2x200G OSFP to 4x100G QSFP56, 1m |
| 04Q56-400G-CUBH | passive copper splitter cable, 400Gb/s Twin-port 2x200G OSFP to 4x100G QSFP56, 1.5m |
| 04Q56-400G-CU2H | passive copper splitter cable, 400Gb/s Twin-port 2x200G OSFP to 4x100G QSFP56, 2m |
| 04Q56-400G-CU3H | passive copper splitter cable, 400Gb/s Twin-port 2x200G OSFP to 4x100G QSFP56, 3m |

Notice

This document is provided for information purposes only and shall not be regarded as a warranty of a certain functionality, condition, or quality of a product. Neither NADDOD make any representations or warranties, expressed or implied, as to the accuracy or completeness of the information contained in this document and assumes no responsibility for any errors contained herein. NADDOD shall have no liability for the consequences or use of such information or for any infringement of patents or other rights of third parties that may result from its use. This document is not a commitment to develop, release, or deliver any material (defined below), code, or functionality.

NADDOD reserves the right to make corrections, modifications, enhancements, improvements, and any other changes to this document, at any time without notice. Customer should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

NADDOD makes no representation or warranty that products based on this document will be suitable for any specified use. Testing of all parameters of each product is not necessarily performed by NADDOD. It is customer's sole responsibility to evaluate and determine the applicability of any information contained in this document, ensure the product is suitable and fit for the application planned by customer, and perform the necessary testing for the application in order to avoid a default of the application or the product.

NADDOD products are sold subject to the NADDOD standard terms and conditions of sale supplied at the time of order acknowledgement, unless otherwise agreed in an individual sales agreement signed by authorized representatives of NADDOD and customer ("Terms of Sale"). NADDOD hereby expressly objects to applying any customer general terms and conditions with regards to the purchase of the NADDOD product referenced in this document. No contractual obligations are formed either directly or indirectly by this document.

Further Information:

Web www.naddod.com

Email For order requirements: sales@naddod.com
For customer service: support@naddod.com
For technical support: tech@naddod.com

For cooperation: agency@naddod.com

For other information: info@naddod.com

Disclaimer

1. We are committed to continuous product improvement and feature upgrades, and the contents contained in this manual are subject to change without notice.
2. Nothing herein should be construed as constituting an additional warranty.
3. NADDOD assumes no responsibility for the use or reliability of equipment or software not provided by NADDOD.

Copyright © NADDOD.COM All Rights



PNY Technologies Europe
9 rue Joseph Cugnot
33708 Mérignac cedex | France
T +33 (0)5 40 240 240 | pnyprom@pnyprom.eu