# 800G Twin-port 2x400Gb/s OSFP to 2x400Gb/s OSFP Passive Copper Cable

## Features

- 2x400Gb/s data rate
- Based on 8-channels of 100G-PAM4 modulation
- 0.5, 1, 1.5, 2, 3 meter lengths
- 0.1 Watts max per end Operate
- SFF-8665 compliant
- Operating case temperature 0-70°C
- Single 3.3V supply voltage
- Hot pluggable
- RoHS compliant
- polyvinylchloride (PVC) jacket
- LF (Lead Free) HF (Halogen Free) PCB
- OSFP msa.org based
- SFF-8636 based I2C management interface

## Applications

- 2x400Gb/s Spectrum-4 Ethernet switch-to-switch

## Description

OSFP-800G-DAC is an 2x400Gb/s twin-port OSFP (Octal Small Form factor Pluggable) to 2x400Gb/s twin-port OSFP Direct Attached Copper cable (DAC).

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. Using the Octal Small Form factor Plug (OSFP) and containing eight high-speed electrical copper pairs, each operating at data rates of up to 100Gb/s.

The DAC firmware supports Ethernet and is automatically enabled depending on the protocol of the switch attached to. EEPROMs provide product configuration information to be read by the host. Every cable length is tuned to reduce internal signal noise and back reflections.

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. | Typical | Max. | Unit | Note |
|---|---|---|---|---|---|
| Supply voltage | -0.3 | | 3.6 | V | |

| | | | | | |
|---|---|---|---|---|---|
| Data Input Voltage | –0.3 | | 3.6 | V | |
| Control Input Voltage | –0.3 | | 3.6 | V | |

## Environmental Specifications

This table shows the environmental specifications for the product

**Table2-Environmental Specifications**

| Parameter | Min | Typical | Max. | Units |
|---|---|---|---|---|
| Storage Temperature | –40 | | 85 | ℃ |

## Operational Specifications

**Table3-Optical Specifications**

| Parameter | Min. | Typical | Max. | Unit | Note |
|---|---|---|---|---|---|
| Supply Voltage (Vcc) | 3.135 | 3.3 | 3.465 | V | |
| Power Consumption | -- | -- | 0.1 | W | |
| Operating Case Temperature | 0 | | 70 | ℃ | |
| Operating Relative Humidity | 5 | | 85 | % | |

## Electrical Performance Requirements

**Table4-Electrical Performance Requirements**

| Test Items | Test Condition | Specification |
|---|---|---|
| Current | | 0.5A per contact |
| Voltage | | 30 vDC per contact |
| LLCR | EIA 364–23, 20mVdc, 100mA | less than 2 ohms. |
| Continuity | Verify the continuous electrical path | No open, short, or high resistance. |

## SI Requirements

| Table5-SI Requirements | | |
|---|---|---|
| **Test Items** | **Specification** | **Notes** |
| SDD21&SDD12 | ⩽19.75 dB Min. @26.56 GHz;<br>⩾ 11.0 dB max. @26.56GHz; | From 0.01 GHz to 26.56GHz |
| ERL | Minimum cable assembly ERL(*) : ⩾ 8.25dB | |
| SCD12–SDD12<br>SCD21–SDD21 | ⩾ 10 0.05GHz⩽f＜12.89GHz<br>⩾ 14–0.3108f 12.89GHz⩽f⩽40GHz | ( up to 40GHz) |

## Mechanical Performance Requirements

| Table6-Mechanical Performance Requirements | | |
|---|---|---|
| **Test Items** | **Test Condition** | **Specification** |
| Mating Forces | A rate of 10mm per minute | OSFP＜40N |
| Un–mating Forces | A rate of 10mm per minute | OSFP＜30N |
| Latch strength | Pull to separate module from cage, Test with connector, cage & module (latch engaged) | Minimum of an 125N force |
| Bulk cable retention in module | Pull to separate bulk cable from module,Test with cable assembly only | Minimum of an 90N force |
| Wire Flex | Flex cable 180° for 10 cycles at X/Y axis, 20 times/minutes, with an 1kg suspended weight. Type C EIA 364–41, test condition I. | No microsecond discontinuities are allowed. |

| | | |
|---|---|---|
| Durability | Perform 50 unplug/plug cycles | No evidence of physical damage |
| Cable Minimum Bend Radius | The cable is bent on time over the correct mandrel with 5 perpendicular, the Minimum bend Radius is 10x OD. | No physical damage, Verify continuity and SI |

## Mechanical Specifications

**Table7-Mechanical Specifications**

| Parameter | Value | | Units |
|---|---|---|---|
| Diameter | 30AWG<br>28AWG | | mm |
| Length tolerance | length < 2 m | ±25 | mm |
| | length ⩾ 2 m | ±50 | |

## Minimum Bend Radius

**Table8-Minimum Bend Radius**

| OPN | Length (m) | AWG (mm) |
|---|---|---|
| OSFP-800G-CU0-5 | 0.50 | 30AWG, 2x8pairs |
| OSFP-800G-CU1 | 1.0 | 28AWG, 2x8pairs |
| OSFP-800G-CU1-5 | 1.5 | 28AWG, 2x8pairs |
| OSFP-800G-CU2 | 2.0 | 28AWG, 2x8pairs |
| OSFP-800G-CU3 | 3.0 | 26AWG, 2x8pairs |

**Note:**

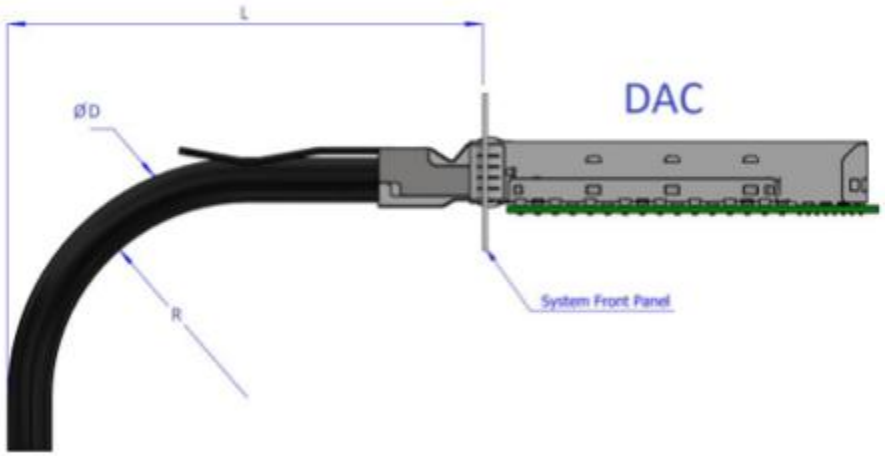
The minimum assembly bending radius (close to the connector) is 10x the cable's outer diameter. The repeated bend (far from

the connector) is also 10x the cable's outer diameter. The single bend (far from the connector) is 5x the cable's outer diameter.

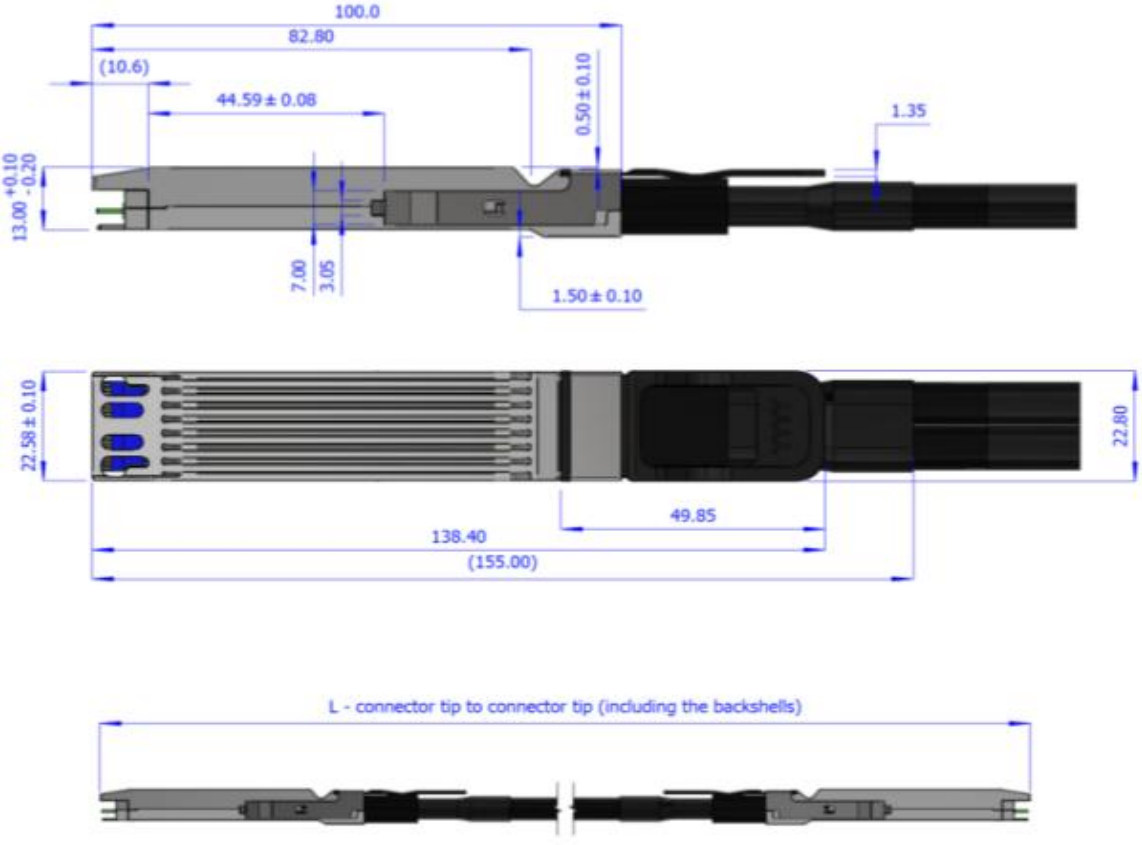
**Combined end' is the 'head' where the cables join together, inserted into the switch. 'Single end' is the 'tail' which plugs into the HCA/NIC in a server.

L = Assembly Space. Minimum value depends on the backshell (connector housing) dimensions = the space for the cable assembly behind the rack door.

## Assembly Bending Radius




## Mechanical Dimensions



## Pin Description

The device is OSFP MSA Specification for OSFP Octal Small Form Factor Pluggable Module Rev. 1.12 compliant,

see www.osfpmsa.org.

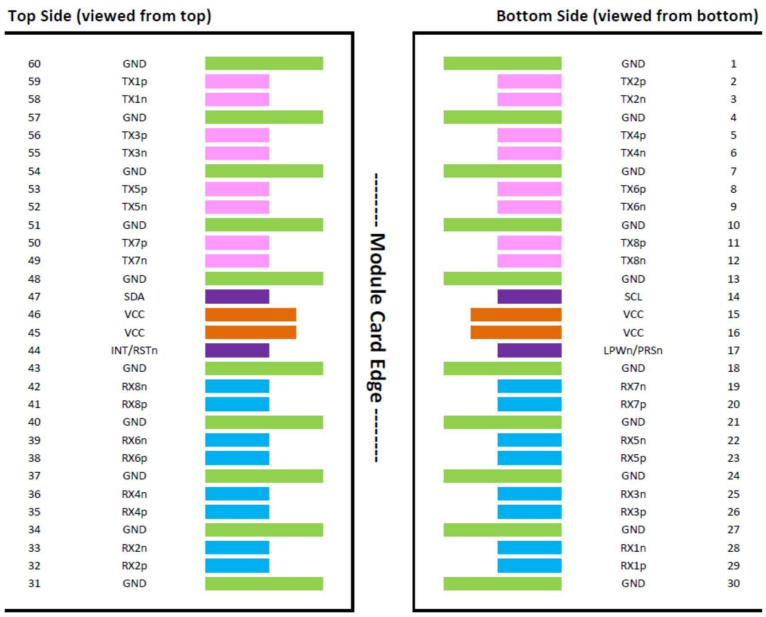
**Table9-Pin Description**

| 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 | 59 | Tx1p | Transmitter Non-Inverted Data |

| | | Output | | | Input |
|---|---|---|---|---|---|
| 30 | GND | Ground | 60 | GND | Ground |

## OSFP Module Pad Layout




## Materials

Connector

- The Backshell material is Nickel Plated Zinc
- 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 cable jacket is polyvinylchloride (PVC) .

- All materials are RoHS complaint
- The cables are UL listed CL2 75°C

## Ordering Information

**Table10-Ordering Information**

| PN | Description |
|---|---|
| OSFP-800G-CU0-5 | passive copper cable, 400Gb/s, up to 800Gb/s, OSFP, 0.5m |
| OSFP-800G-CU1 | passive copper cable, 400Gb/s, up to 800Gb/s, OSFP, 1m |
| OSFP-800G-CU1-5 | passive copper cable, 400Gb/s, up to 800Gb/s, OSFP, 1.5m |
| OSFP-800G-CU2 | passive copper cable, 400Gb/s, up to 800Gb/s, OSFP, 2m |
| OSFP-800G-CU3 | passive copper cable, 400Gb/s, up to 800Gb/s, OSFP, 3m |

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