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

Features

- 800Gb/s to two 400Gb/s data rates
- Based on 100G-PAM4 modulation
- 0.5, 1, 1.5 ,2 and 3 meter lengths
- OSFP ends each consume 0.1 Watts
- Operating case temperature 0-70°C
- Hot pluggable
- RoHS compliant
- Poly Vinyl Chloride (PVC) jacket
- LF (Lead Free) HF (Halogen Free) PCB
- CMIS compliant I2C management interface (OSFP end)

Applications

- Spectrum-4 Ethernet switch-to-two 400Gb/s ConnectX-7 OSFP adapters

Description

O2O112-800G-DAC is an 800Gb/s twin-port OSFP (Octal Small Form- factor Pluggable) to 2x400Gb/s OSFP passive Direct Attach Copper (DAC) dual breakout (aka splitter) cable for 400Gb/s End-to-End Ethernet solutions. The DAC firmware supports Ethernet and is automatically enabled depending on the protocol of the switch attached to.

The 8-channel twin-port OSFP end uses a finned top form-factor for use in Spectrum-4 switch cages. The two 400G ends support 4-channels of 100G-PAM4 (400G) and use a flat top OSFP for use in ConnectX-7 adapters using riding heat sinks on the connector cage.

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. The “passive” term refers to the copper cable containing no electronics in the data path. Each end includes an EEPROM which provides product identification and characteristics to the host system. Every cable length is tuned to reduce internal signal noise and back reflections.

Main use is linking an 800Gb/s Spectrum-4 switch to OSFP based 400Gb/s ConnectX-7 PCIe network adapter cards.

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	˚C

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; ⩾ 11.0 dB max. @26.56GHz;	From 0.01 GHz to 26.56GHz
ERL	Minimum cable assembly ERL(*) : ⩾ 8.25dB	
SCD12-SDD12	⩾ 10 0.05GHz⩽f＜12.89GHz	(up to 40GHz)

SCD21–SDD21	⩾ 14–0.3108f　12.89GHz⩽f⩽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 bendRadius is 10x OD.	No physical damage, Verify continuity and SI

Minimum Bend Radius

Table7-Minimum Bend Radius

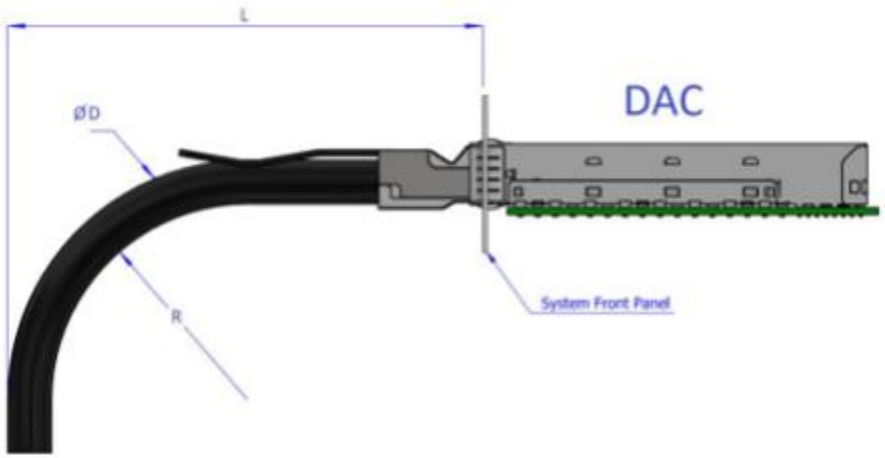
OPN	Length (m)	AWG (mm)
O2O112-800G-CUA	0.50	30AWG, 2x8pairs
O2O112-800G-CU1	1.0	28AWG, 2x8pairs
O2O112-800G-CUB	1.5	28AWG, 2x8pairs
O2O112-800G-CU2	2.0	28AWG, 2x8pairs
O2O112-800G-CU3	3.0	26AWG, 2x8pairs

Note:

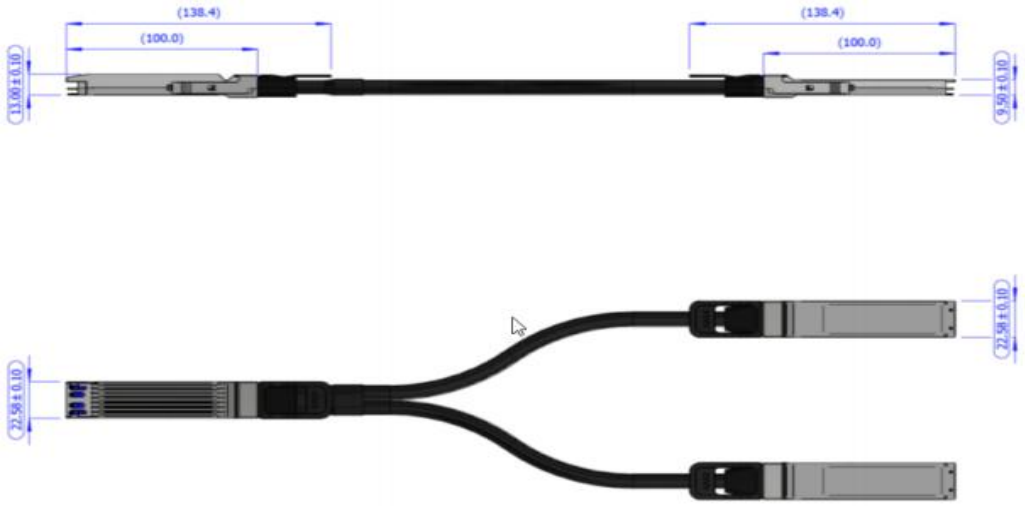
The minimum assembly bending radius (close to the connector) is 10x the cable's outer diameter. The repeated bend (far from the connector) is also 10x the cable's outer diameter. The single bend (far from the connector) is 5x the cable's outer diameter. **Combined end' is the 'head' where the cables 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

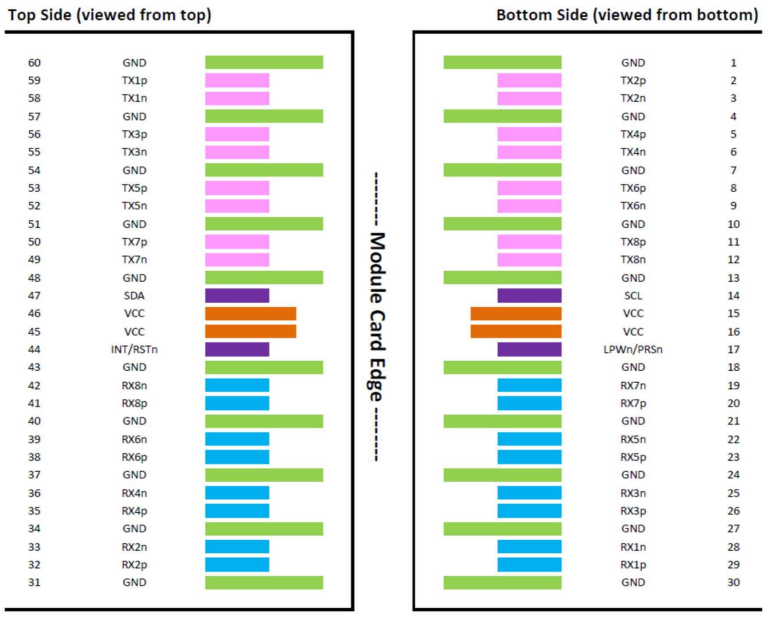
Table8-Pin Description

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



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 Poly Vinyl Chloride (PVC) .
- All materials are RoHS complaint
- The cables are UL listed CL2 75˚C

Ordering Information

Table9-Ordering Information

PN	Description
O2O112-800G-CUA	passive copper splitter cable, 800Gb/s to 2x 400Gb/s, OSFP to 2x OSFP, 0.5m
O2O112-800G-CU1	passive copper splitter cable, 800Gb/s to 2x 400Gb/s, OSFP to 2x OSFP, 1m
O2O112-800G-CUB	passive copper splitter cable, 800Gb/s to 2x 400Gb/s, OSFP to 2x OSFP, 1.5m
O2O112-800G-CU2	passive copper splitter cable, 800Gb/s to 2x 400Gb/s, OSFP to 2x OSFP, 2m
O2O112-800G-CU3	passive copper splitter cable, 800Gb/s to 2x 400Gb/s, OSFP to 2x OSFP, 3m

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