

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

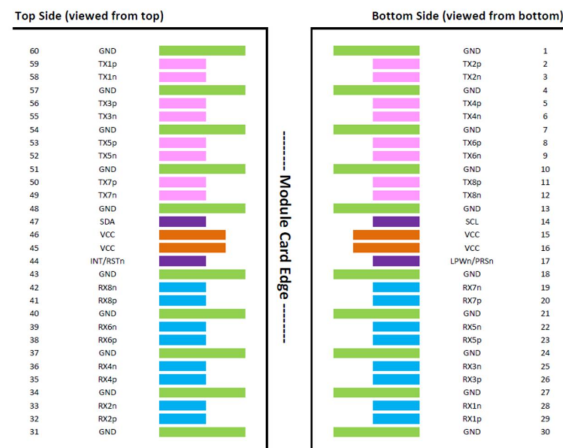
Table4-High Speed Characteristics			
No	Test Items	Specification	Notes
1	SDD21&SDD12	-17.16 dB Min. @13.28 GHz	From 0.01 GHz- 19GHz
2	SDD11&SDD22	<ul style="list-style-type: none"> -16.5+2*sqrt(f)dB Max. @0.05GHz~4.1GHz -10.66+14*log(f/5.5)dB Max.@4.1GHz~10GHz 	From 0.01 GHz- 19GHz
3	SCD21-SDD21	<ul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

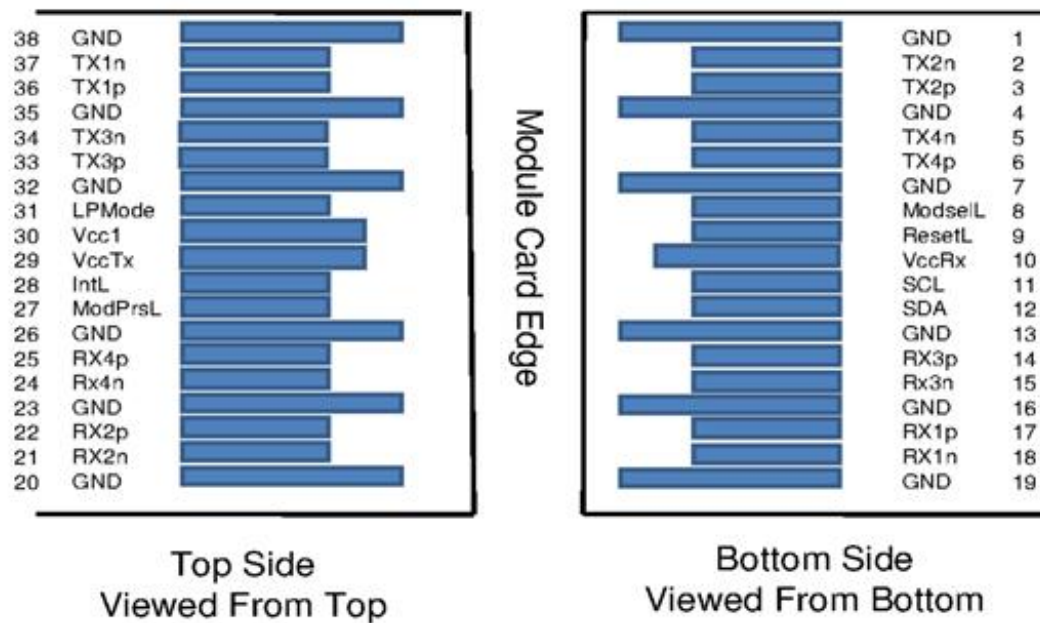


QSFP56 Pin Description

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

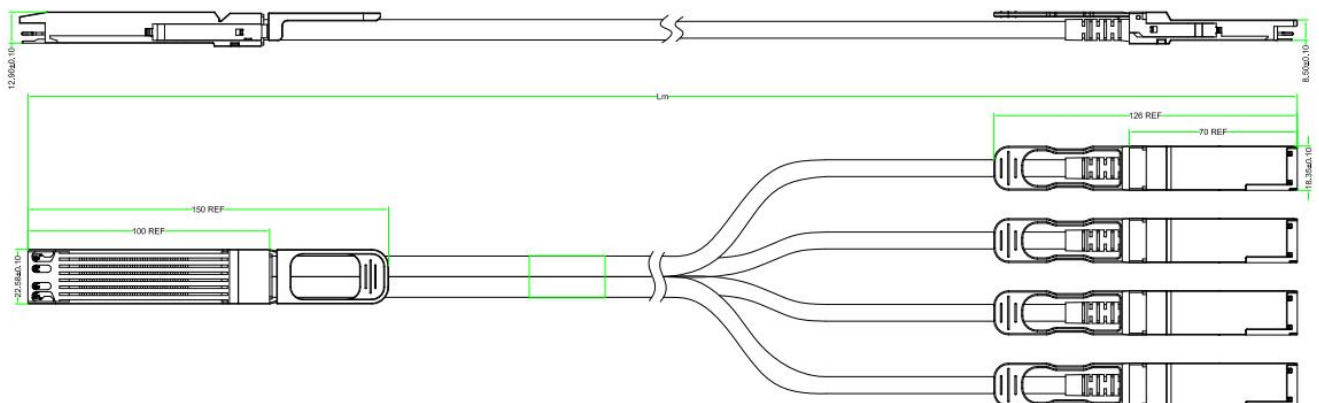
15	Rx3n	Connected to Port 2 lane Tx1 Inverted Data	34	Tx3n	Connected to Port 2 lane Rx1 Inverted Data
16	Ground	Ground	35	Ground	Ground
17	Rx1p	Connected to Port 1 lane Tx1 Non-Inverted Data	36	Tx1p	Connected to Port 1 lane Rx1 Non-Inverted Data
18	Rx1n	Connected to Port 1 lane Tx1 Inverted Data	37	Tx1n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

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