400G OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable

Features

- 400Gb/s to 2x200Gb/s data rate
- Programmable Rx output amplitude and pre-emphasis
- OSFP head end is CMIS 4.0 compliant
- QSFP56 ends are SFF-8636 compliant
- Single 3.3V power supply
- 5W Max power consumption for QSFP56 ends
- 10W Max power consumption for the OSFP head end
- Hot pluggable
- RoHS compliant
- SFF-8636 compliant I2C management interface

Description

O2Q56-400G-AOCH is an OSFP to 2x QSFP56, 400Gb/s to 2 x 200Gb/s Active Optical splitter Cable (AOC) designed for connecting NDR switch with OSFP cage to legacy 2 HDR switch/HCA QSFP56 cages.

The cable is compliant with SFF-8665 for the QSFP56 pluggable solution. It provides connectivity between system units with a OSFP 400Gb/s connector on one side and two separate QSFP56 200Gb/s connectors on the other side, such as a switch and two servers. The cable connects data signals from each of the 8 MMF (Multi Mode Fiber) pairs on the single OSFP end to the four pairs of each of the QSFP56 multiport ends. Each QSFP56 and OSFP end of the cable comprises an EEPROM providing product and status monitoring information, which can be read by the host system.

Rigorous production testing ensures the best out-of-the-box installation experience, performance, and durability.

NADDOD's unique quality active fiber cable solutions provide power-efficient connectivity for data center interconnects. It enables higher port bandwidth, density and configurability at a low cost, and reduced power requirement in the data centers

Absolute Maximum Specifications

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

Prolonged operation between the operational specifications and absolute maximum ratings is not intended and may cause permanent device degradation.

Table1-Absolute Maximum Specifications

Parameter	Min.	Max.	Unit
Supply voltage	-0.3	3.6	V
Data input voltage	-0.3	3.465	V
Control input voltage	-0.3	4.0	V
Damage Threshold	3.4	---	dBm

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

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.

Table3-Optical Specifications

Parameter	Min.	Typical	Max.	Units
Supply voltage (Vcc)	3.135	3.3	3.465	V
Power consumption 200Gb/s end	---	4.35	4.5	W
Power consumption 400Gb/s end	---	9.0	10	W
Supply noise tolerance (10Hz – 10MHz)	66	---	---	mVpp
Operating case temperature	0	---	70	°C
Operating relative humidity	5	---	85	%

Electrical Specification

Table4-Electrical Specification

Parameter	Min.	Typical	Max	Units
Signaling rate	-100 ppm	26.5625	+100 ppm	GBd
Differential data input swing at TP1a	TBD	---	900	mVpp
Differential data output swing at TP4	---	---	900	mVpp
Near-end ESMW	0.265	---	---	UI
Near-end output eye height	70	---	---	mVpp
Output transition time, 20% to 80%	9.5	---	---	ps

Notes:

[1] Multiple clock domains are supported only on line-side Rx

[2] QSFP Tx CDR lock can only occur if Tx lane 4 is transmitting data

Mechanical Specifications

Table5-Mechanical Specifications

Parameter	Value		Units
Diameter	3 +/-0.2		mm
Minimum bend radius	30		mm
Length tolerance	length < 5 m	+300 /-0	mm
	5 m ≤ length < 50 m	+500 / -0	
	50 m ≤ length	+1000 /-0	
Cable color	Aqua		

Connectivity Schematic

Table6-Connectivity Schematic

400Gb/s Side	2x20Gb/s Side
	Port1
TX1	RX1
RX1	TX1
TX2	RX2
RX2	TX2
TX3	RX3
RX3	TX3
TX4	RX4
RX4	TX4
	Port2
TX5	RX1
RX5	TX1
TX6	RX2
RX6	TX2
TX7	RX3
RX7	TX3
TX8	RX4
RX8	TX4

Pin Description

The AOC is OSFP MSA Specification for OSFP Octal Small Form Factor Pluggable Module Rev. 1.12 compliant, see www.osfpmsa.org.

Table7-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

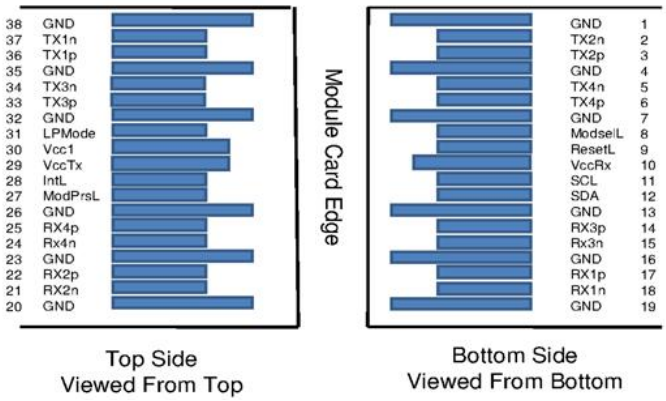
OSFP Module Pad Layout

QSFP56 Pin Description 200Gb/s End

Table8-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



Ordering Information

Table9-Ordering Information

PN	Description
O2Q56-400G-A3H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,3m
O2Q56-400G-A5H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,5m
O2Q56-400G-A10H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,10m
O2Q56-400G-A15H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,15m
O2Q56-400G-A20H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,20m
O2Q56-400G-A30H	400Gb/s OSFP to 2x200Gb/s QSFP56 HDR Active Optical Splitter Cable,30m

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