

TITLE 400G OSFP-RHS to 2x200G QSFP56 Active Optical Cable	DOC No. RFD-20250204001-001	
	REVISION : 01	AUTHORIZED BY : Albert Lin
	DATE : 2025.02.14	CLASSIFICATION : Active Optical Cable

1. PRODUCT DESCRIPTION

The 400G AOC is an 8-Channel, Pluggable, Parallel, Fiber-Optic 400G OSFP-RHS to 2 x 200G QSFP56 AOC. It integrates 8 data lanes in each direction at OSFP end and 4 data lanes in each direction at QSFP end. Each lane can operate at 53.125Gbps up to 70 m using OM3 fiber with FEC. These modules are designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 60 contacts edge type connector at OSFP end and 38 contacts edge type connectors at QSFP56 end.

2. PRODUCT FEATURES

- Hot-pluggable OSFP form factor / QSFP form factor
- Transmission data rate up to 53Gbps per channel
- 8x53Gbps PAM4 transmitter and PAM4 receiver at OSFP-RHS end
- 4x53Gbps PAM4 transmitter and PAM4 receiver at QSFP56 end
- 8 channels 850nm VCSEL array at OSFP-RHS end
- 4 channels 850nm VCSEL array at QSFP56 end
- 8 channels PIN array at OSFP-RHS end
- 4 channels PIN array at QSFP56 end
- Power consumption < 10W at OSFP-RHS end
- Power consumption < 5.5W at QSFP56 end
- CMIS V4.0 compliant for OSFP-RHS
- SFF8636 compliant for QSFP56
- Operating case temperature: 0°C~+70°C
- RoHS6 compliant (lead free)

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3. PRODUCT APPLICATIONS

- InfiniBand HDR

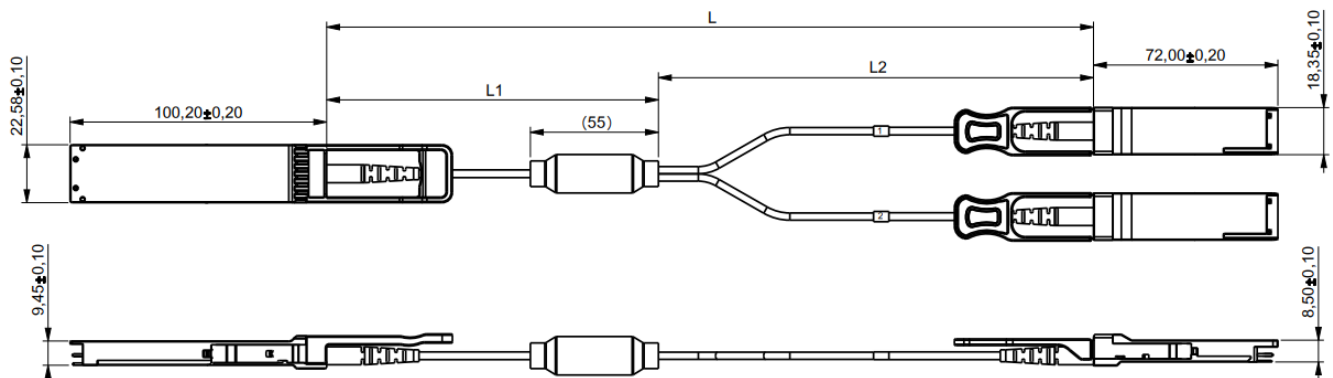
4. PRODUCT DESCRIPTION

4.1 PRODUCT NAME

400G OSFP-RHS to 2x200G QSFP56 AOC

Bit Rate	Distance	Connector	Tem.	DDMI	Fiber Type
200G/400G	Up to 70m-OM3 to 100m-OM4	N/A	C	yes	MMF

4.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified

Length comparison table

L	L1	L2	Notes
1m	30cm	70cm	The tolerance for branches is +7/-0cm; The length between different branches is +1/-0cm;
2m	60cm	1.4m	
3m	1m	2m	
≥5m	L-3m	3m	

AOC product bagging circle size:

L	Disc fiber diameter (mm)
1m≤L≤5m	110±Inner diameter, outer diameter≤160
5m<L≤7m	110±Inner diameter, outer diameter≤170
7m<L≤30m	110±Inner diameter, outer diameter≤180
30m<L≤50m	110±Inner diameter, outer diameter≤210
50m<L≤100m	110±Inner diameter, outer diameter≤250

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5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Voltage	V _{CC3}	-0.5	-	+3.6	V	
Storage Temperature	T _s	-40	-	+85	°C	
Operating Humidity	RH	+15	-	+85	%	

Recommended Operating Conditions and Power Supply Requirements						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _c	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	

Electrical Interface Characteristics						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Differential Input Voltage Amplitude	V _{in}	300		900	mV	1
Differential Output Voltage Amplitude	V _{out}	300		900	mV	2
Signaling rate per lane	DR	26.5625± 100 ppm			GBd	
Differential termination mismatch				10	%	
Input Logic Level High	V _{IH}	2.0		V _{CC}	V	
Input Logic Level Low	V _{IL}	0		0.8	V	
Output Logic Level High	V _{OH}	V _{CC} -0.5		V _{CC}	V	
Output Logic Level Low	V _{OL}	0		0.4	V	

Notes:

1. Differential input voltage amplitude is measured between TxnP and TxnN
2. Differential output voltage amplitude is measured between RxnP and RxnN.

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6. Applications Note:

Electrical Pad Layout (OSFP end)

Top Side (viewed from top)

60	GND	
59	TX1p	
58	TX1n	
57	GND	
56	TX3p	
55	TX3n	
54	GND	
53	TX5p	
52	TX5n	
51	GND	
50	TX7p	
49	TX7n	
48	GND	
47	SDA	
46	VCC	
45	VCC	
44	INT/RSTn	
43	GND	
42	RX8n	
41	RX8p	
40	GND	
39	RX6n	
38	RX6p	
37	GND	
36	RX4n	
35	RX4p	
34	GND	
33	RX2n	
32	RX2p	
31	GND	

----- Module Card Edge -----

Bottom Side (viewed from bottom)

	GND	1
	TX2p	2
	TX2n	3
	GND	4
	TX4p	5
	TX4n	6
	GND	7
	TX6p	8
	TX6n	9
	GND	10
	TX8p	11
	TX8n	12
	GND	13
	SCL	14
	VCC	15
	VCC	16
	LPWn/PRSn	17
	GND	18
	RX7n	19
	RX7p	20
	GND	21
	RX5n	22
	RX5p	23
	GND	24
	RX3n	25
	RX3p	26
	GND	27
	RX1n	28
	RX1p	29
	GND	30

Pin Function Definitions for QSFP28

PIN	Symbol	Name/Description	Note
1	GND	Ground	
2	TX2p	Transmitter Data Non-Inverted	
3	TX2n	Transmitter Data Inverted	

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4	GND	Ground	
5	Tx4p	Transmitter Data Non-Inverted	
6	TX4n	Transmitter Data Inverted	
7	GND	Ground	
8	TX6p	Transmitter Data Non-Inverted	
9	TX6n	Transmitter Data Inverted	
10	GND	Ground	
11	TX8p	Transmitter Data Non-Inverted	
12	TX8n	Transmitter Data Inverted	
13	GND	Ground	
14	SCL	2-wire Serial interface clock	
15	VCC	+3.3V Power	
16	VCC	+3.3V Power	
17	LPWn/PR Sn	Low-Power Mode / Module Present	
18	GND	Ground	
19	RX7n	Receiver Data Inverted	
20	RX7p	Receiver Data Non-Inverted	
21	GND	Ground	
22	RX5n	Receiver Data Inverted	
23	RX5p	Receiver Data Non-Inverted	
24	GND	Ground	
25	RX3n	Receiver Data Inverted	
26	RX3p	Receiver Data Non-Inverted	
27	GND	Ground	
28	RX1n	Receiver Data Inverted	
29	RX1p	Receiver Data Non-Inverted	

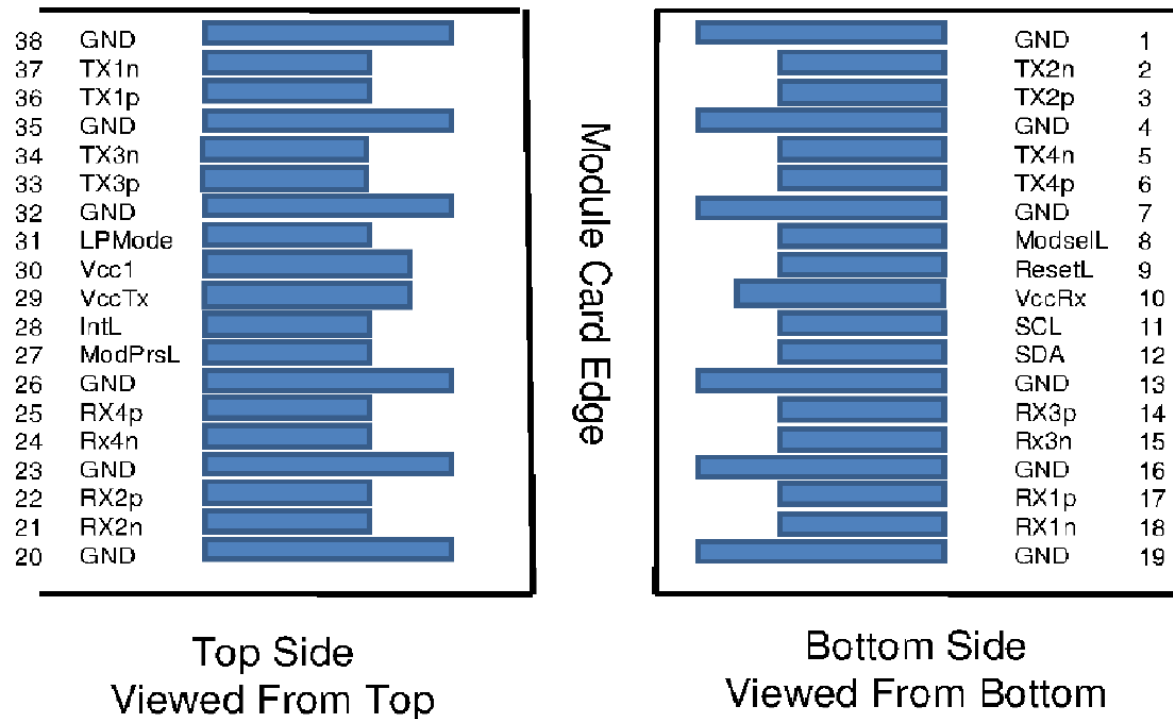
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30	GND	Ground	
31	GND	Ground	
32	RX2p	Receiver Data Non-Inverted	
33	RX2n	Receiver Data Inverted	
34	GND	Ground	
35	RX4p	Receiver Data Non-Inverted	
36	RX4n	Receiver Data Inverted	
37	GND	Ground	
38	RX6p	Receiver Data Non-Inverted	
39	RX6n	Receiver Data Inverted	
40	GND	Ground	
41	RX8p	Receiver Data Non-Inverted	
42	RX8n	Receiver Data Inverted	
43	GND	Ground	
44	INT/RSTn	Module Interrupt / Module Reset	
45	VCC	+3.3V Power	
46	VCC	+3.3V Power	
47	SDA	2-wire Serial interface data	
48	GND	Ground	
49	TX7n	Transmitter Data Inverted	
50	TX7p	Transmitter Data Non-Inverted	
51	GND	Ground	
52	TX5n	Transmitter Data Inverted	
53	TX5p	Transmitter Data Non-Inverted	
54	GND	Ground	
55	TX3n	Transmitter Data Inverted	

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56	TX3p	Transmitter Data Non-Inverted	
57	GND	Ground	
58	TX1n	Transmitter Data Inverted	
59	TX1p	Transmitter Data Non-Inverted	
60	GND	Ground	

Electrical Pad Layout (OSFP56 end)



Pin Function Definitions for QSFP56

PIN	Symbol	Name/Description	Note
1	GND	Ground	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	
5	Tx4n	Transmitter Inverted Data Input	

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6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3 V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VCC Tx	+3.3 V Power supply transmitter	
30	VCC1	+3.3 V Power Supply	
31	LPMode	Low Power Mode	

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32	GND	Ground	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	

7. Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

8. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2025.02.14	Albert Lin	Mike Sun