

LQD-AOC12400-5M

QSFP56-DD to 2xQSFP56 Active Optical Cable

Features

- Active optical cable with breakout from QSFP-DD 400G to two QSFP56 200G
- Up to 53.125Gbps data rate per channel PAM4 modulation
- Integrated 850nm VCSEL array and PD array
- DDM function implemented
- Hot-pluggable
- Low power dissipation: : <8W on QSFP-DD end, <4W on QSFP56 end
- Commercial operating case temperature range: 0°C to 70 °C
- Compliant with ROHS2.0

Applications

- Data centers and Cloud Network
- 200G InfiniBand HDR systems

Standards

- IEEE 802.3cd
- CMIS4.0



Absolute Maximum Ratings

Product	Electrical mode	Protocol	Nominal Rate			Specifications		Link
			Aggregate (Gbps)	Electrical Lanes(Gbaud)	ppm	High Speed Electrical	Pre-FEC Max BER	
QSFP-DD end	8X50	IEEE802.3cd	425	26.5625 PAM4	±100	400GAUI-8	2.4E-4	0.5~100m
QSFP56 end	4X50	IEEE802.3cd	212.5	26.5625 PAM4	±100	200GAUI-4	2.4E-4	

Parameter	Symbol	Unit	Min	Max
Case Operating Temperature	Top	°C	0	70
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	85
Power Supply Voltage	Vcc	V	-0.5	3.6

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature Range	Tca	°C	0	/	70
Power Supply Voltage	Vcc	V	3.135	3.3	3.465

Electric Ports Definition

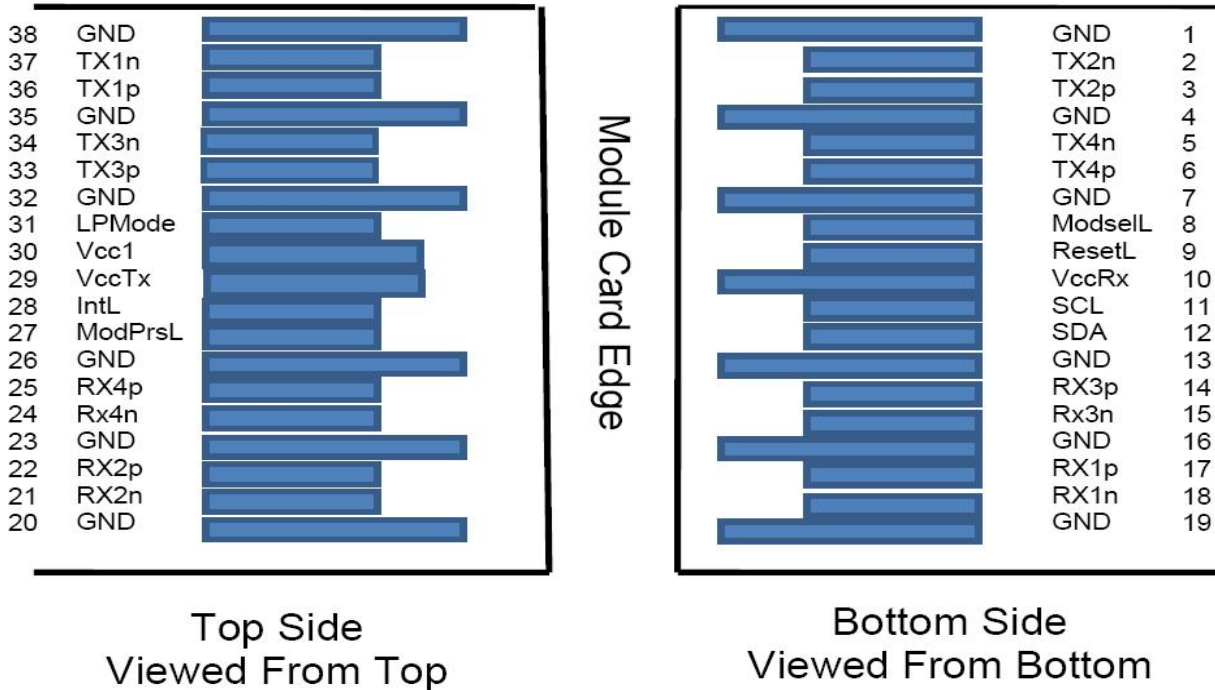
Parameter	Symbol	Unit	Min	Typ	Max	Notes
Supply Voltage	VCC	V	3.135	3.3	3.465	
Power Consumption	Pc	W			8	400G end
					4	200G end
Transmitter						
Input Differential Impedance	R _{IN}	Ω	80	100	120	
Single Ended Data Input Swing	V _{IN}	mVp-p	90		500	
Transmit Disable Voltage	V _{DIS}	V	2		V _{CCHOST}	
Transmit Enable Voltage	V _{EN}	V	V _{EE}		VEE+0.8	
Transmit Fault Assert Voltage	V _{FA}	V	2		V _{CCHOST}	
Transmit Fault De-Assert Voltage	V _{FDA}	V	V _{EE}		V _{EE} +0.8	

Pin No.	Symbol	Description
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data output
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data output
7	GND	Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	VccRx	3.3V 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	VccTx	3.3V power supply transmitter
30	Vcc1	3.3V power supply
31	Init Mode	Initialization mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Output
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Output
38	GND	Ground
39	GND	Ground

40	Tx6n	Transmitter Inverted Data Input
41	Tx6p	Transmitter Non-Inverted Data output
42	GND	Ground
43	Tx8n	Transmitter Inverted Data Input
44	Tx8p	Transmitter Non-Inverted Data output
45	GND	Ground
46	Reserved	For Future Use
47	VS1	Module Vendor Specific 1
48	VccRx1	3.3V Power Supply
49	VS2	Module Vendor Specific 2
50	VS3	Module Vendor Specific 3
51	GND	Ground
52	Rx7p	Receiver Non-Inverted Data Output
53	Rx7n	Receiver Inverted Data Output
54	GND	Ground
55	Rx5p	Receiver Non-Inverted Data Output
56	Rx5n	Receiver Inverted Data Output
57	GND	Ground
58	GND	Ground
59	Rx6n	Receiver Inverted Data Output
60	Rx6p	Receiver Non-Inverted Data Output
61	GND	Ground
62	Rx8n	Receiver Inverted Data Output
63	Rx8p	Receiver Non-Inverted Data Output
64	GND	Ground
65	NC	No Connect
66	Reserved	For Future Use
67	VccTx1	3.3V power supply
68	Vcc2	3.3V power supply
69	Reserved	For Future Use
70	GND	Ground
71	Tx7p	Transmitter Non-Inverted Data Input
72	Tx7n	Transmitter Inverted Data Output
73	GND	Ground
74	Tx5p	Transmitter Non-Inverted Data Input
75	Tx5n	Transmitter Inverted Data Output
76	GND	Ground

QSFP56 en

The electrical interface to the transceiver is a 38 pins edge connector. The 38 pins provide high speed data, low speed monitoring and control signals, I2C communication, power and ground connectivity. The top and bottom views of the connector are provided below, as well as a table outlining the contact numbering, symbol and full description.



Pin	Symbol	Name/Description
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
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
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input

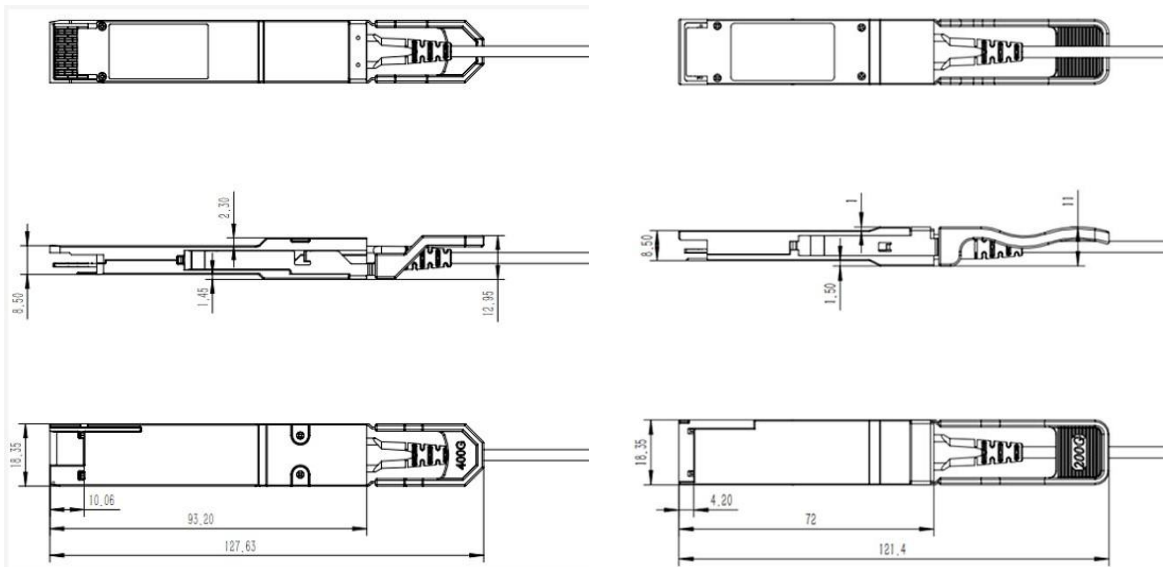
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

Module Memory Map

Compatible with CMIS rev 4.0

Package Outline

The mechanical specifications are based on QSFP-DD and QSFP56 transceiver module specification, substituting the optical connectors with a cable connecting both ends.



Cable Breakout point

Total Length (m)	Breakout * 2*100G (m)
1	0.5
2	0.5
3	1
5	2
7	3
10	3
X (X≥10)	3

Standard Cable lengths for each PN

Part Number	Description
LQD-AOC12400-0M5	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 0.5M
LQD-AOC12400-1M	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 1M
LQD-AOC12400-3M	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 3M
LQD-AOC12400-5M	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 5M
LQD-AOC12400-7M	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 7M
LQD-AOC12400-10	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 10M
LQD-AOC12400-xx	400G QSFP56-DD SR8 AOC FanOut To 2*200G QSFP56 SR4 xxM

xx: means cable length