

TSB2Q-85M-XXXCB Active Optical Cable

Multi-Mode 400G OSFP to 2 x 200G QSFP56 HDR Active Optical Cable, With Diagnostic Monitoring

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 end
- 4x53Gbps PAM4 transmitter and PAM4 receiver at QSFP56 end
- 8 channels 850nm VCSEL array at OSFP end
- 4 channels 850nm VCSEL array at QSFP56 end
- 8 channels PIN array at OSFP end
- 4 channels PIN array at QSFP56 end
- Power consumption < 12W at OSFP end
- Power consumption < 5.5W at QSFP56 end
- CMIS V5.1 compliant for OSFP
- SFF8636 compliant for QSFP56
- Operating case temperature: 0°C~+70°C
- RoHS6 compliant (lead free)

Applications

- InfiniBand HDR

Description

The TSB2Q-85M-XXXCB is an 8-Channel, Pluggable, Parallel, Fiber-Optic 400G OSFP 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.

Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity ¹	RH	15	85	%

Notes:

1. Non-condensing.

Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	VCC	3.15	3.30	3.45	V
Operating Case Temperature	Tca	0	-	70	°C

Electrical Characteristics

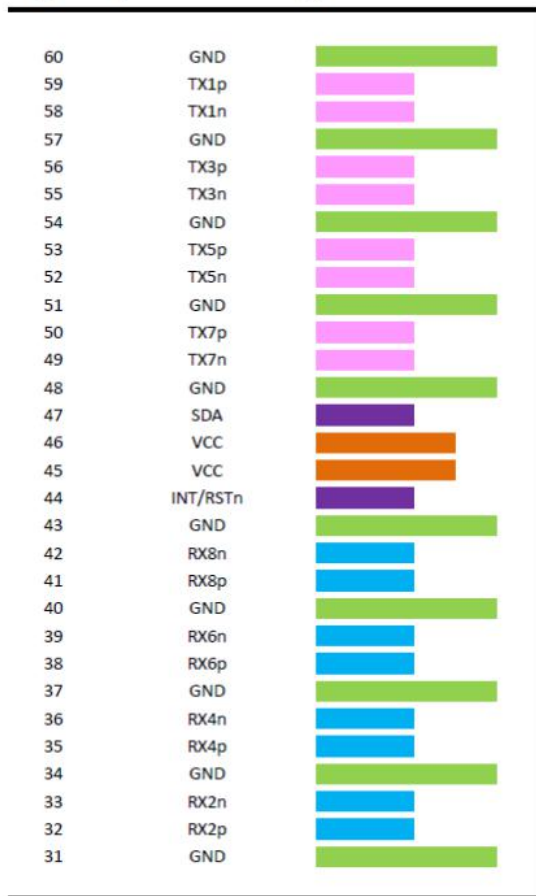
Parameter	Symbol	Min.	Typical	Max	Unit
Differential Input Voltage Amplitude ¹	Vin	300	-	900	mV
Differential Output Voltage Amplitude ²	Vout	300	-	900	mV
Signaling rate per lane	DR	26.5625± 100 ppm			GBps
Differential termination mismatch	-	-	-	10	%
Input Logic Level High	VIH	2.0	-	VCC	V
Input Logic Level Low	VIL	0	-	0.8	V
Output Logic Level High	VOH	VCC-0.5	-	VCC	V
Output Logic Level Low	VOL	0	-	0.4	V

Notes:

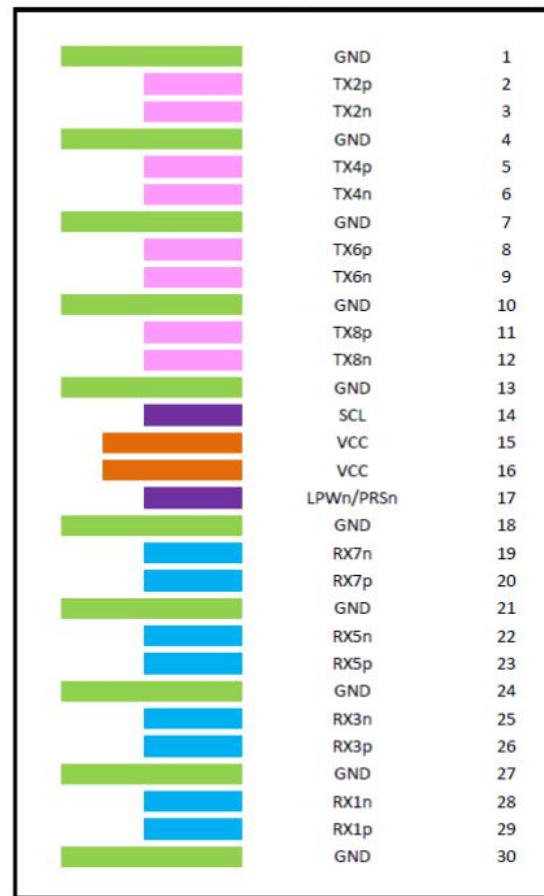
1. Differential input voltage amplitude is measured between TxnP and TxnN
2. Differential output voltage amplitude is measured between RxnP and RxnN.

Electrical Pad Layout (OSFP end)

Top Side (viewed from top)



Bottom Side (viewed from bottom)



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

Pin Definition (OSFP end)

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

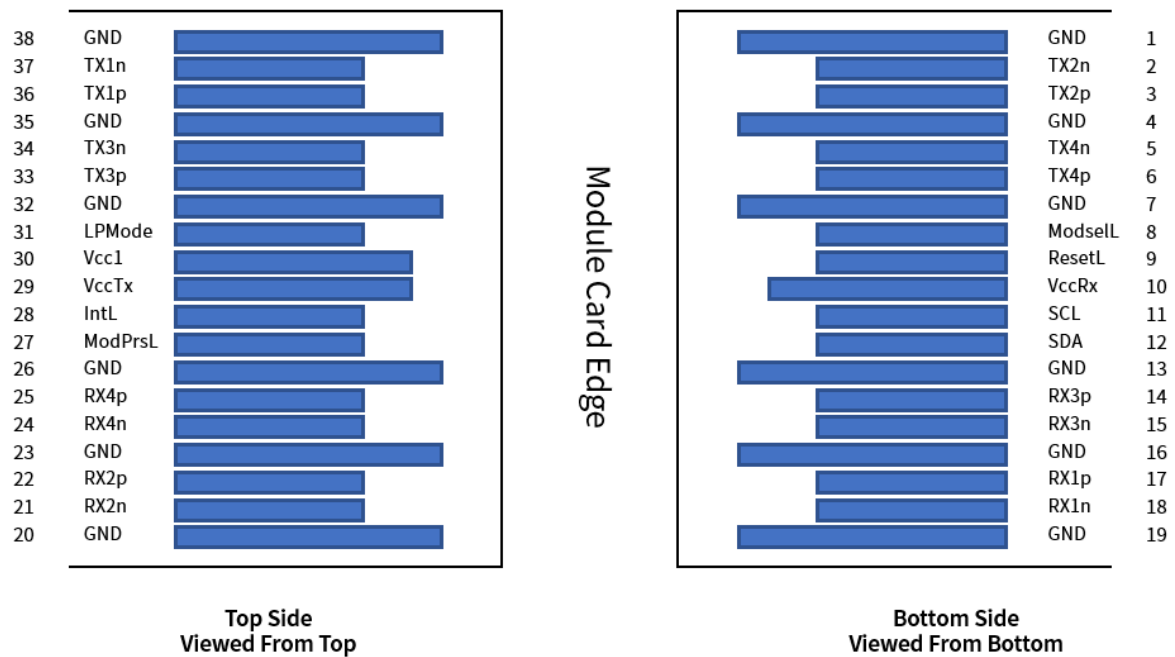
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54	GND	Ground
55	TX3n	Transmitter Data Inverted
56	TX3p	Transmitter Data Non-Inverted
57	GND	Ground
58	TX1n	Transmitter Data Inverted
59	TX1p	Transmitter Data Non-Inverted
60	GND	Ground

Electrical Pad Layout (QSFP56 end)



Pin Definition (QSFP56 end)

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

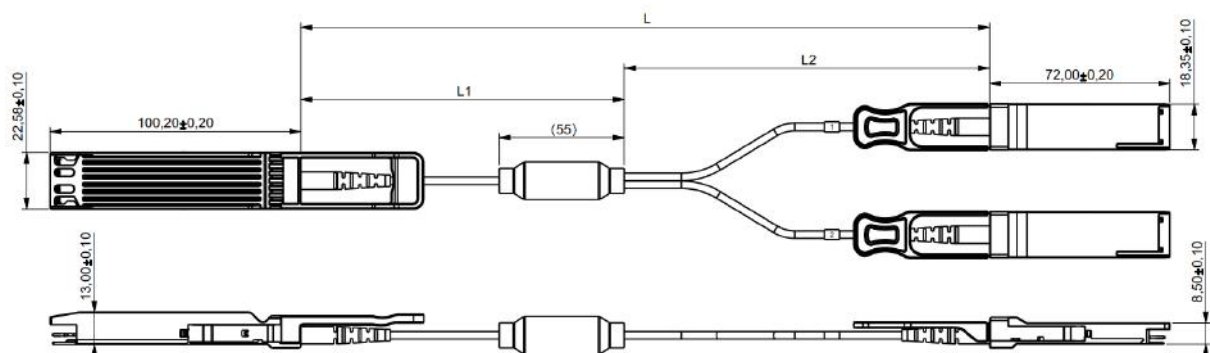
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12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
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

Mechanical



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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

Length tolerance table:

L	Tolerance (mm)
L≤1 M	+70/-0
1 M<L<7 M	+100/-0
L≥7 M	+2%L/-0

Connectivity Schematic

400Gb/s Side	2x200Gb/s Side
	Port 1
TX1	RX1
RX1	TX1
TX2	RX2
RX2	TX2
TX3	RX3
RX3	TX3
TX4	RX4
RX4	TX4
	Port 2
TX5	RX1
RX5	TX1
TX6	RX2
RX6	TX2
TX7	RX3
RX7	TX3
TX8	RX4
RX8	TX4

Ordering Information

Part Number	Product Description
TSB2Q-85M-XXXC	400G OSFP to 2 x 200G QSFP56 HDR AOC 0°C ~ +70°C
XXX :001~030,1~30 Length in meters on OM3 MMF	

Important Notice

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