

TSB2Q-85R-XXXD Active Optical Cable

Multi-mode 850nm 400G OSFP TO 2 x 200G OSFP Active Optical Cable, With Diagnostic Monitoring

Features

- Hot-pluggable OSFP form factor
- Data Rate 106.25 Gb/s PAM4 per lane
- 4x106Gbps PAM4 transmitter and PAM4 receiver
- 4 channels 850nm VCSEL array and PIN photo detector array
- Power consumption < 10W per end
- CMIS V5.1 compliant
- Operating case temperature: 0°C~+70°C
- RoHS6 compliant (lead free)

Applications

- 400G Ethernet
- Switch & Router Connections

Description

The TSB2B-85R-XXXD is a 4-Channel, Pluggable, Parallel, Fiber-Optic 400G OSFP to 2 x 200G OSFP AOC. This AOC is a high performances module for short-range multi-lane data communication and interconnect applications. It integrates four data lanes in each direction with 4x53.125GBd. Each lane can operate at 106.25Gbps up to 60 m using OM3 fiber or 100 m using OM4 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.

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	-	1100	mV
Differential Output Voltage Amplitude ²	Vout	300	-	900	mV
Signaling rate per lane	DR	53.1255± 100 ppm			GBps
Differential termination mismatch	-	-	-	10	%
Skew	-	-	-	300	ps
Bit Error Rate ³	BER	-	-	2.4E-4	-
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.
3. BER=2.4E-4; PRBS31@53.125Gbps. Pre-FEC

Electrical Pad Layout

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
	SDA	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 Definition

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

Information and specifications are subject to change without notice.
Please visit www.china-tscom.com for more information

8 Jinxiu Middle Road, Pingshan, Shenzhen, Guangdong, 518118, P. R. China
+86 755 32983688 | info@china-tscom.com | www.china-tscom.com



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

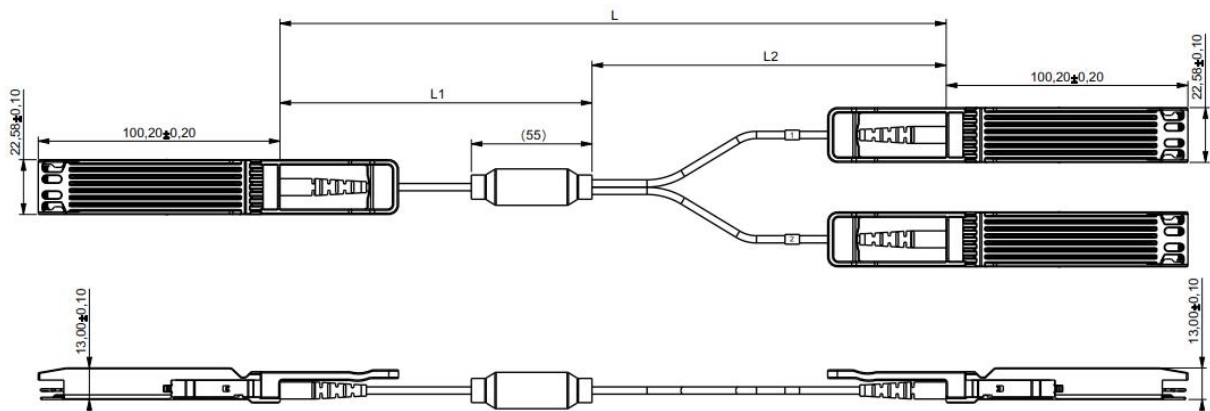
Information and specifications are subject to change without notice.
Please visit www.china-tscom.com for more information

8 Jinxiu Middle Road, Pingshan, Shenzhen, Guangdong, 518118, P. R. China
+86 755 32983688 | info@china-tscom.com | www.china-tscom.com



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

Mechanical



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	

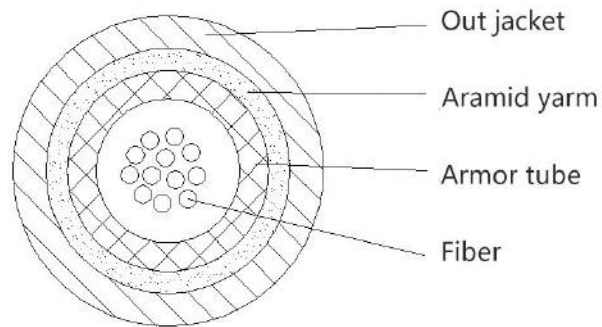
AOC product bagging circle size:

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

Cable Structure



Cable Technical Parameters

Parameter	Symbol	Typical
Model		GJFKV
Fiber	Count	2~12
	Color	Blue, orange, green, brown, gray, white, red, black, yellow, purple, pink, aqua
Cable	OD (mm)	3.0 ± 0.1
	Material	PVC-OFNP
Armored tube	OD (mm)	1.8 ± 0.1
	ID (mm)	1.2 ± 0.1
Max.tensile Strength(N)	Short-term	150
	Long-term	80
Min.Bending Radius(mm)	Dynamic	20D
	Static	10D
Max.Crush Resistance(N/100mm)	Short-term	3000
	Long-term	1000
Strength Members		Aramid yarn
Temperature range	Storage or transportation	-20~70°C
	Operation	-20~60°C
	Installation	-20~60°C

Ordering Information

Part Number	Product Description
TSB2B-85R-XXXD	400G OSFP to 2 x 200G OSFP Armored AOC 0°C ~ +70°C
XXX :001~030, 1~30 Length in meters on OM3 MMF	

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by T&S before they become applicable to any particular order or contract. In accordance with the T&S policy of continuous improvement specifications may change without notice.

The publication of information in this data sheet does not imply freedom from patent or other protective rights of T&S or others. Further details are available from any T&S sales representative.