TSD8S-85M-XXXD Active Optical Cables

Multi-Mode 400G BASE SR8 QSFP-DD TO 8X50G BASE SR SFP56 Active Optical Cable, With Diagnostic Monitoring

Features

- 8-channel full-duplex active optical cable
- Data rate up to 53.125 Gbps per lane
- Compliant to the QSFP-DD MSA /SFP56 MSA
- VCSEL Array Transmitter and PIN Array Receiver
- Low Power Dissipation: QSFP-DD <10W; SFP56 <3W
- Operating case temperature -5°C to 70°C
- RoHS compliant

Applications

- IEEE 802.3bm 200GBASE SR4 Ethernet
- IEEE 802.3by 25GBASE SR Ethernet
- IEEE 802.3cd 400GBASE SR8 Ethernet
- IEEE 802.3cd 50GBASE SR Ethernet

Description

The TSD8S-85M-XXXD is a 4-Channel, Pluggable, Parallel, Fiber-Optic 400G QSFP-DD to 8X50G SFP56 AOC. This transceiver is a high performance module for short-range multi-lane data communication and interconnect applications. It integrates 8 data lanes in each direction with 400Gbps bandwidth.

These modules are designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 76@QSFP-DD and 20@SFP56 contact 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

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Relative Humidity	RH	0	85	%

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
Supply Voltage	VCC	3.15	3.30	3.45	V
Case Operating Temperature	Tca	0	-	70	°C
Data Rate Per Lane	DR	-	53.125	-	Gbps
Fiber Bend Radius	Rb	3	-	-	cm

Notes:

1. Supply current is shared between VCCTX and VCCRX.

2. In-rush is defined as current level above steady state current requirements.

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit
Input differential impedance	Rin	90	100	110	Ω
Differential Input Voltage swing, per lane	Vin	300	-	1100	mV
Transmit Disable Voltage	VD	2.0	-	VCC+0.3	V
Transmit Enable Voltage	Ven	Vee	-	Vee+0.8	V

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit
Differential Output Swing, per lane	Vout	300	-	900	mV
Bit Error Rate@53.125 Gbps	BER1	-	-	2.4E-4	-
Bit Error Rate@25.78125 Gbps	BER2	-	-	5E-5	-
Output Differential Impedance	Rout	90	100	110	Ω
Loss of Signal –Asserted	-	2.0	-	VCC+0.3	V
Loss of Signal –Negated	-	Vee	-	Vee+0.8	V

Transceiver Electrical Pad Layout (QSFP-DD end)

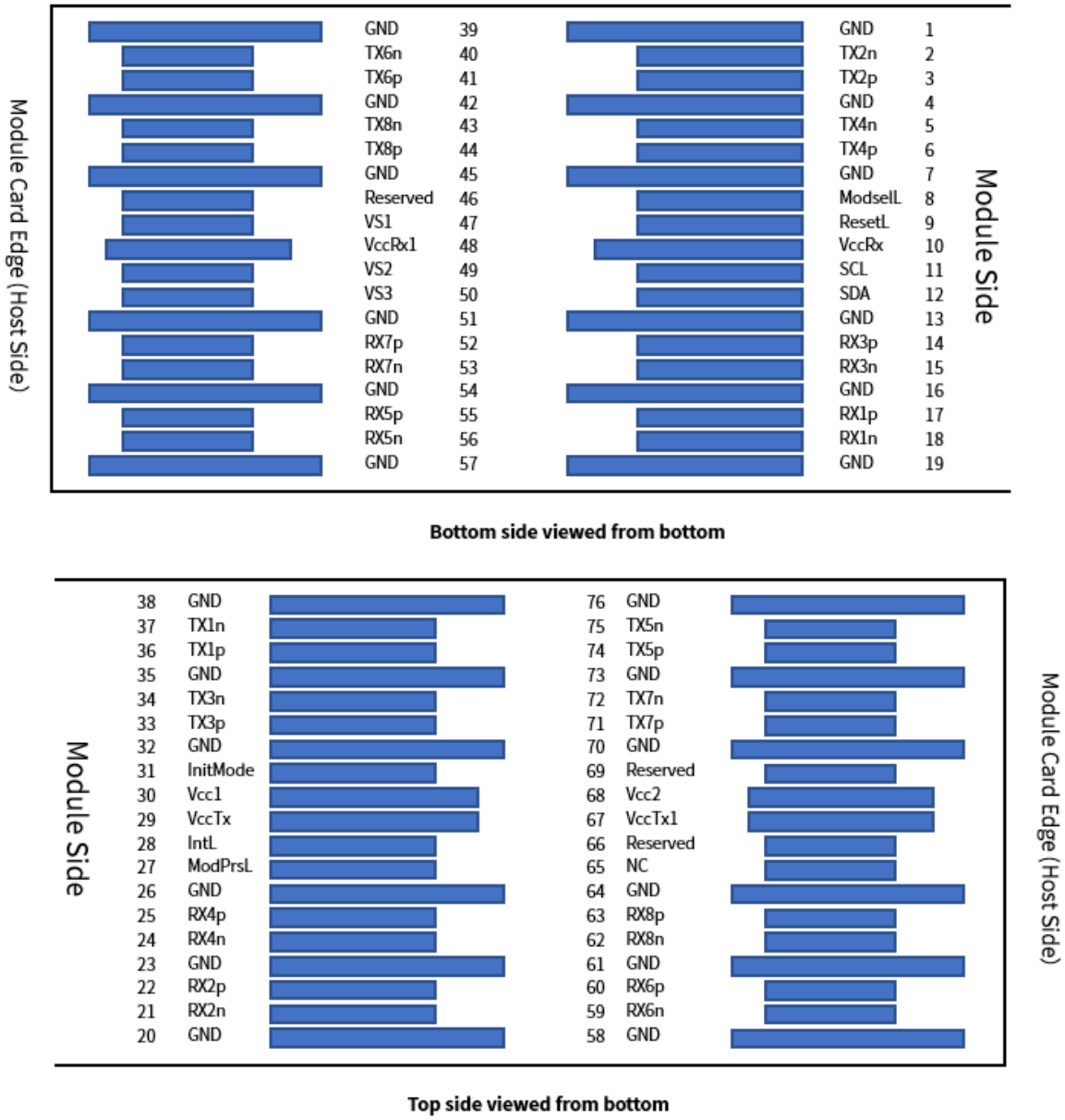


Figure 1 – QSFP-DD Compliant 76-pin connector (per QSFP-DD MSA)

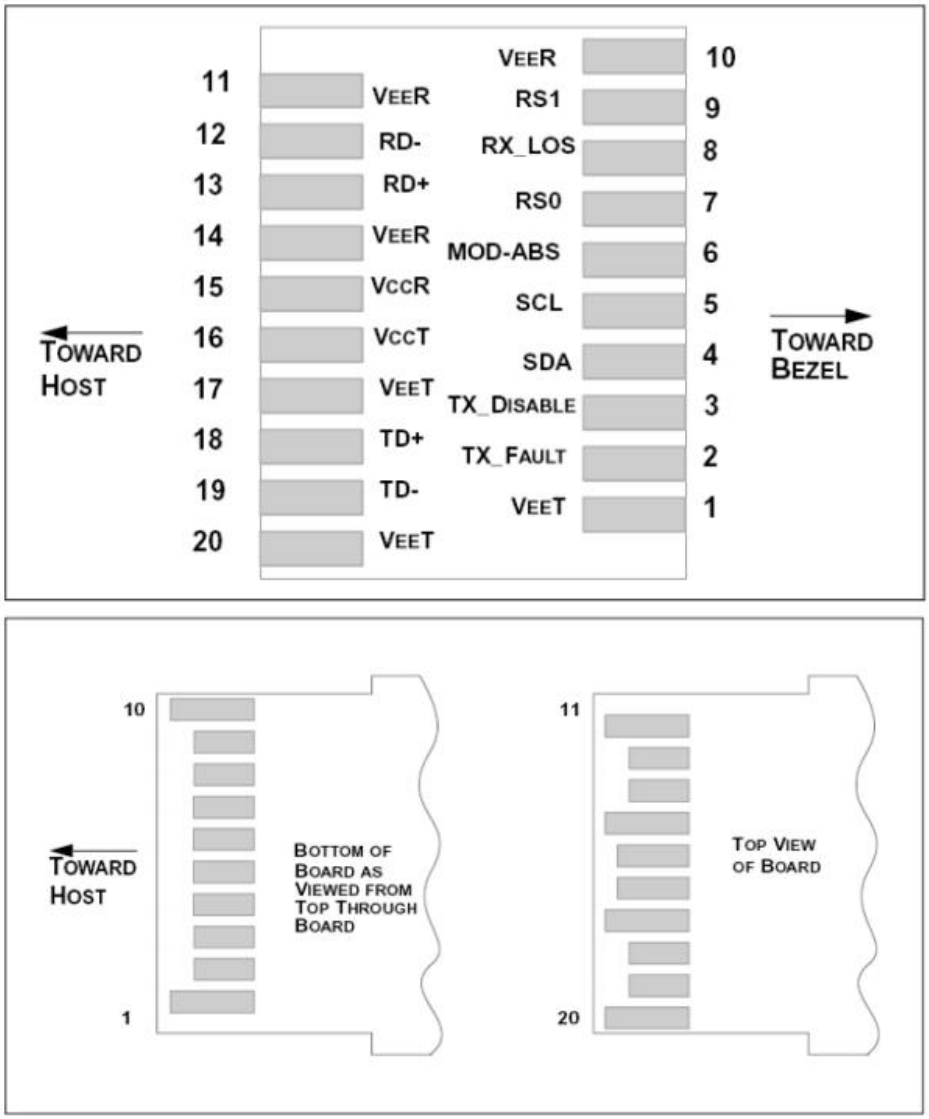
Pin Definition (QSFP-DD end)

Pin	Symbol	Name/Description
1	GND	Module Ground
2	Tx2-	Transmitter inverted data input
3	Tx2+	Transmitter non-inverted data input
4	GND	Module Ground
5	Tx4-	Transmitter inverted data input

6	Tx4+	Transmitter non-inverted data input
7	GND	Module Ground
8	MODSEIL	Module Select
9	ResetL	Module Reset
10	VCCRx	+3.3V Receiver Power Supply
11	SCL	2-wire Serial interface clock
12	sda	2-wire Serial interface data
13	GND	Module Ground
14	RX3+	Receiver non-inverted data output
15	RX3-	Receiver inverted data output
16	GND	Module Ground
17	RX1+	Receiver non-inverted data output
18	RX1-	Receiver inverted data output
19	GND	Module Ground
20	GND	Module Ground
21	RX2-	Receiver inverted data output
22	RX2+	Receiver inverted data output
23	GND	Module Ground
24	RX4-	Receiver inverted data output
25	RX4+	Receiver non-inverted data output
26	GND	Module Ground
27	ModPrsL	Module Present, internal pulled down to GND
28	IntL	Interrupt output, should be pulled up on host board
29	VCCTx	+3.3V Transmitter Power Supply
30	VCC1	+3.3V Power Supply
31	InitMode	Initiallzation mode; In legacy QSFP applications, the InitMode pad is
32	GND	Module Ground
33	Tx3+	Transmitter non-inverted data input
34	Tx3-	Transmitter inverted data input
35	GND	Module Ground
36	Tx1+	Transmitter non-inverted data input
37	Tx1-	Transmitter inverted data input
38	GND	Module Ground
39	GND	Module Ground
40	Tx6-	Transmitter inverted data input
41	Tx6+	Transmitter non-inverted data input
42	GND	Module Ground
43	Tx8-	Transmitter inverted data input
44	Tx8+	Transmitter non-inverted data input
45	GND	Module Ground
46	Reserved	For future use

47	VS1	Module Vender Specific 1
48	VCCRx1	+3.3V Power Supply
49	VS2	Module Vender Specific 2
50	VS3	Module Vender Specific 3
51	GND	Module Ground
52	RX7+	Receiver non-inverted data output
53	RX7-	Receiver inverted data output
54	GND	Module Ground
55	RX5+	Receiver non-inverted data output
56	RX5-	Receiver inverted data output
57	GND	Module Ground
58	GND	Module Ground
59	RX6-	Receiver inverted data output
60	RX6+	Receiver inverted data output
61	GND	Module Ground
62	RX8-	Receiver inverted data output
63	RX8+	Receiver non-inverted data output
64	GND	Module 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	Module Ground
71	Tx7+	Transmitter non-inverted data input
72	Tx7-	Transmitter inverted data input
73	GND	Module Ground
74	Tx5+	Transmitter non-inverted data input
75	Tx5-	Transmitter inverted data input
76	GND	Module Ground

Transceiver Electrical Pad Layout (SFP56 end)

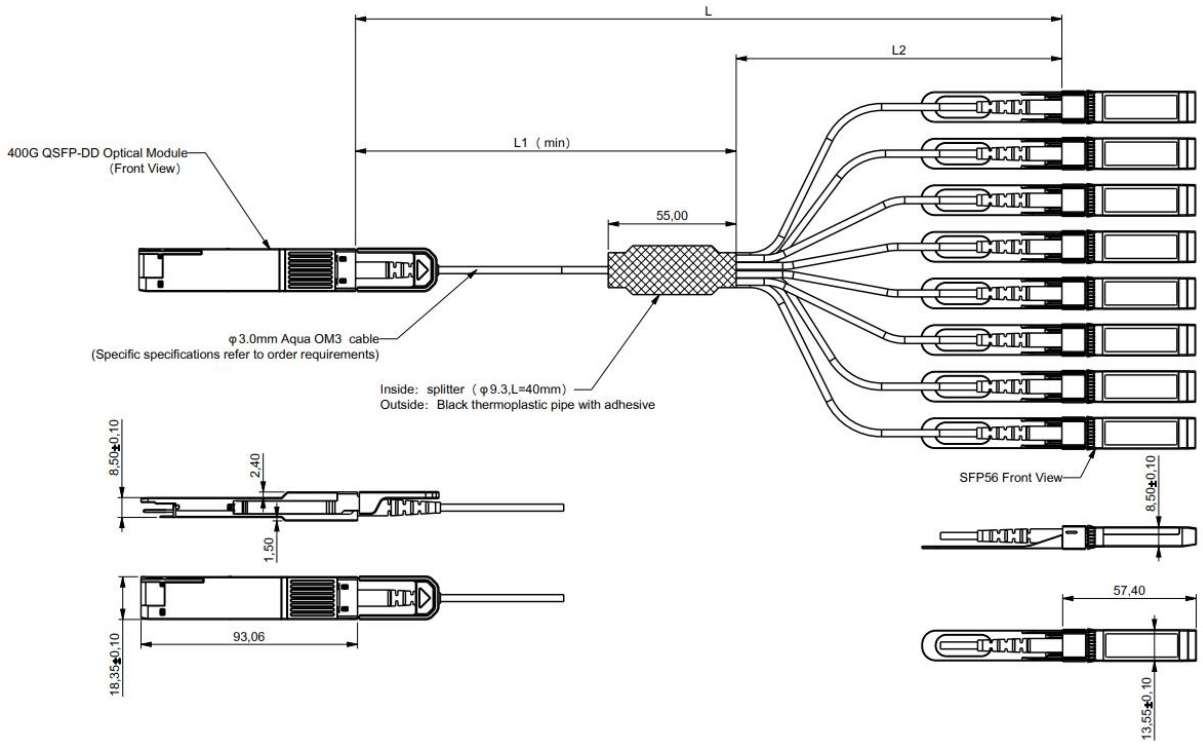


Pin Definition (SFP56 end)

Pin	Symbol	Name/Description
1	VEET	Transmitter Ground
2	Tx_FAULT	Transmitter Fault
3	Tx_DIS	Transmitter Disable. Laser output disabled on high or open
4	SDA	2-wire Serial Interface Data Line
5	SCL	2-wire Serial Interface Clock Line
6	MOD_ABS	Module Absent. Grounded within the module
7	RS0	Rate Select 0
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1	Rate Select 1
10	VEER	Receiver Ground

11	VEER	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET	Transmitter Ground

Mechanical

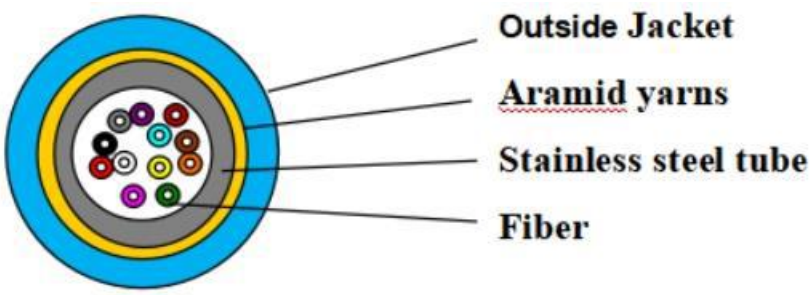


L	L1	L2
1m	0.3m	0.7m
2m	0.6m	1.4m
3m	1m	2m
≥5m	L-3m	3m

L tolerance:

L	Tolerance (mm)
L≤1m	+50/-0
1m<L<7m	+100/-0
L≥7m	+2%L/-0

Cable Structure (QSFP-DD end)



（cross-section）

Cable Technical Parameters (QSFP-DD end)

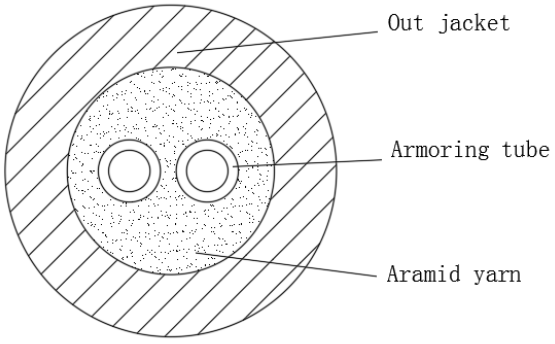
The corresponding dimension of the whole fiber optic cable.

Fiber Count	Fiber type	Cable Diameter (mm)	Stainless steel tube diameter	Tight-buffered fiber diameter (mm)
16	4.0GJFKH-16S	Φ4.0±0.2	Φ2.4±0.1	Φ0.25

The corresponding parameters of the whole fiber optic cable.

Cable type	Cable Diameter (mm)	Cable weight KG/KM	Tensile N		Bend radius (mm)*		Crush N/100mm
			Short time	Long time	dynamic	static	
5.0GJFJKH-16S	Φ4.0±0.2	24	400	200	60	30	3000

Cable Structure (SFP56 end)



Cable Technical Parameters (SFP56 end)

Parameter	Symbol	Typical
Armored tube	OD(mm)	0.9±0.1
	ID(mm)	0.5±0.1
	Material	Stainless steel spiral armor
Out jacket	OD(mm)	3.0±0.1
	Material	PVC/LSZH
Nominal weight(kg/km)		13
Max.tensile Strength(N)	Short-term	100
	Long-term	50
Max.Crush Resistance(N/100mm)	Short-term	3000
	Long-term	1000
Color		According to contract
Strength Members		Aramid yarn
Environmental Protection		RoHS COMPLIANT
Temperature range	Storage or transportation	-20~70℃
	Operation	-20~60℃
	Installation	-20~60℃

Ordering Information

Part Number	Product Description
TSD8S-85M-XXXD	400G QSFP-DD TO 8x50G SFP56 Armored AOC -5℃ ~ +70℃

XXX :001~070,1~70 Length in meters on OM3 MMF

XXX :001~100,1~100 Length in meters on OM4 MMF

Important Notice

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