TSQ4S-85G-XXXD/TSQ4S-85G-XXXU Active Optical Cables

Multi-Mode 40G BASE SR4 QSFP+ TO 4X10G BASE SR SFP+ Active Optical Cable, With Diagnostic Monitoring

Features

- 4-channel full-duplex active optical cable
- Data rate up to 10.3125 Gbps per lane
- Compliant to the QSFP+ MSA /SFP+ MSA
- VCSEL Array Transmitter and PIN Array Receiver
- Low Power Dissipation: QSFP+ <1.4W; SFP+ <0.8W

Applications

- 40GBASE SR4 Ethernet
- 10GBASE SR Ethernet

Product Description

The TSQ4S-85G-XXXC/ TSQ4S-85G-XXXT is a 4-Channel, Pluggable, Parallel, Fiber-Optic 40G QSFP+ to 4X10G SFP+ AOC. This transceiver is a high performance module for short-range multi-lane data communication and interconnect applications. It integrates 4 data lanes in each direction with 40Gbps bandwidth.

These modules are designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 38@QSFP+ and 20@SFP+ 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.

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	0	85	%

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Recommended Operating Conditions

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 (Standard)	Tca	0	-	70	℃
Case Operating Temperature (Industrial)	Tca	-40	-	85	℃
Data Rate Per Lane	DR	-	10.3125	-	Gbps
Fiber Bend Radius	Rb	3	-	-	cm

Note:

1. Supply current is shared between VCCTX and VCCRX.
2. In-rush is defined as current level above steady state current requirements.

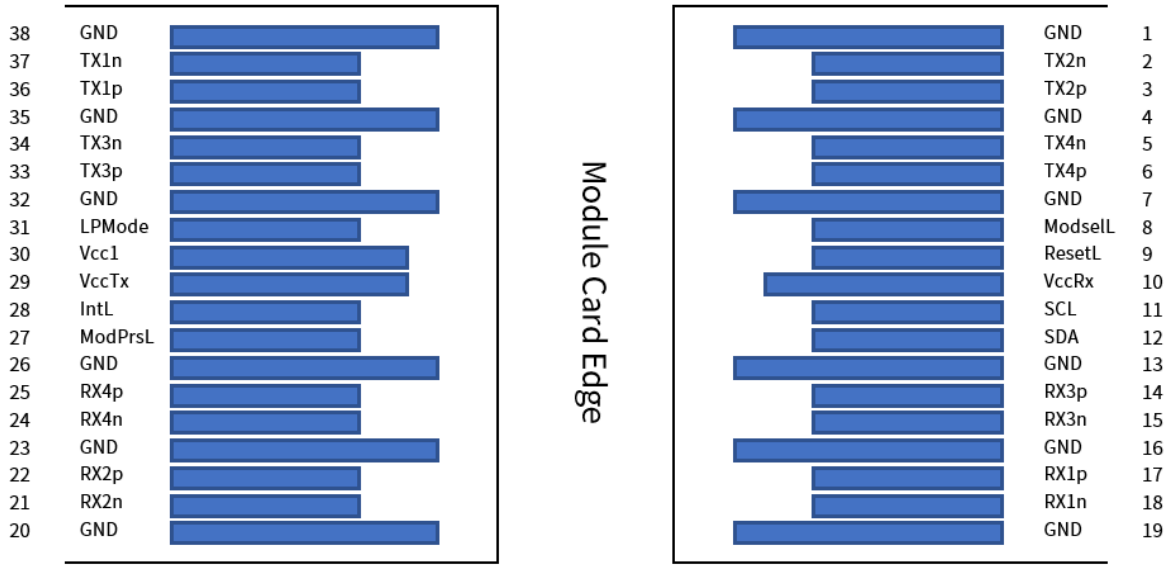
Transmitter Specifications

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

Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Differential Output Swing, per lane	Vout	300	-	900	mV
Bit Error Rate	BER	-	-	10^{-12}	-
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+ end)



Top Side
Viewed From Top

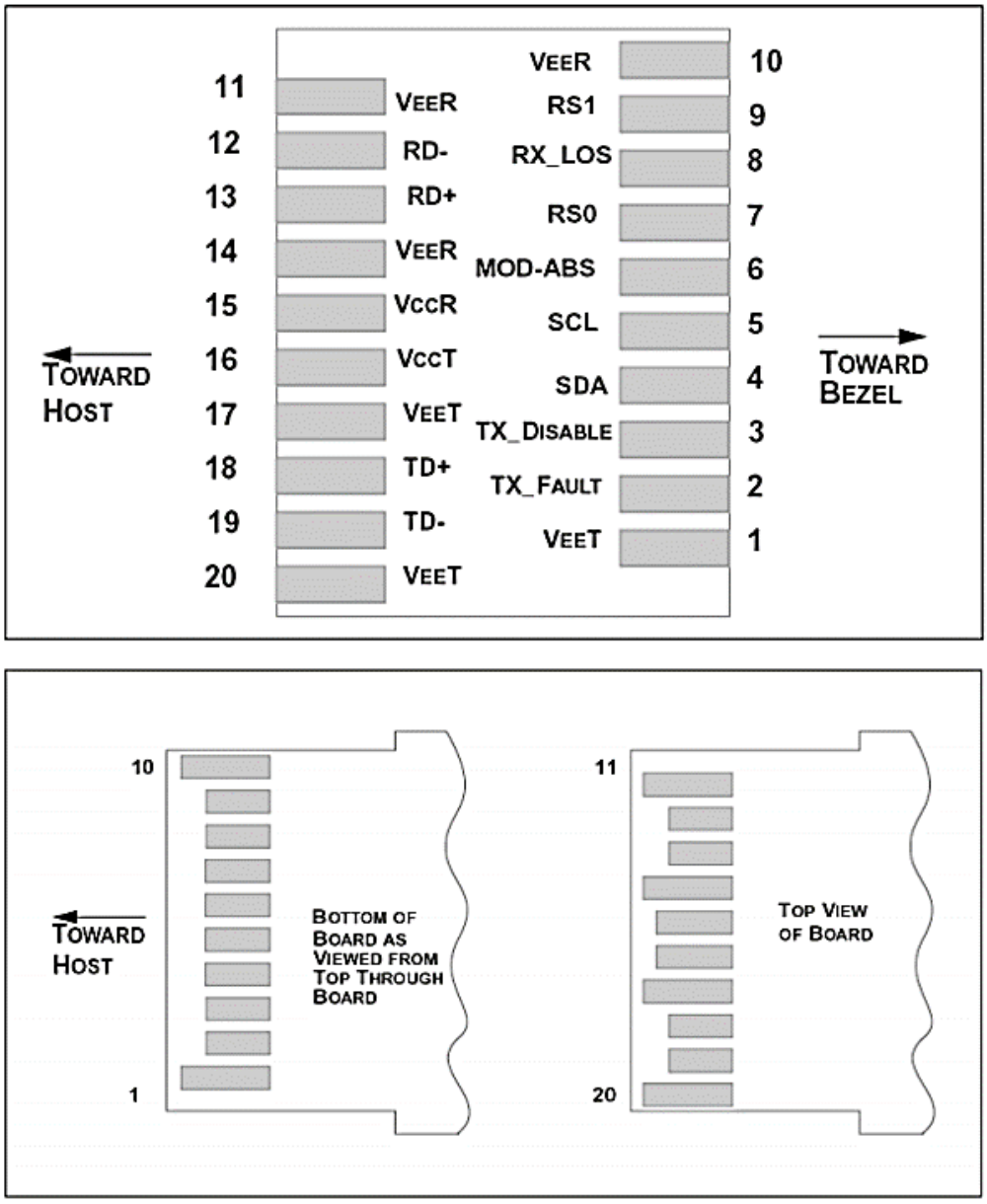
Bottom Side
Viewed From Bottom

Pin Definitions (QSFP+ 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
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

Transceiver Electrical Pad Layout (SFP+ end)

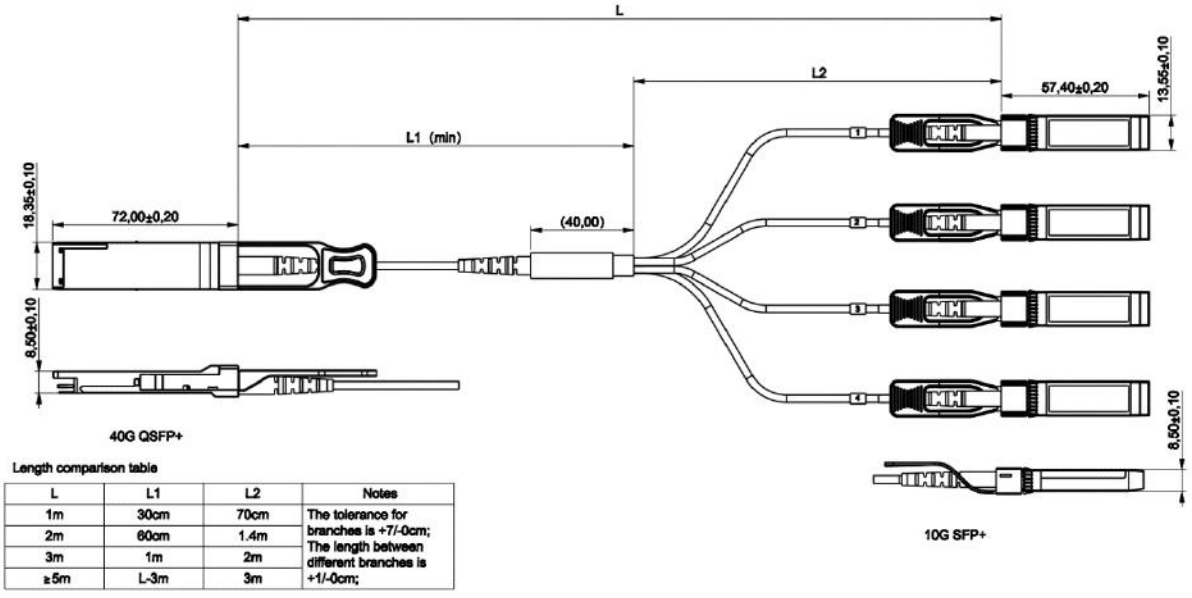


Pin Definitions (SFP+ end)

Pin	Symbol	Name/Description
1	VeeT	Transmitter Signal Ground
2	TX_FAULT	Transmitter Fault (LVTTL-O) – Not used. Grounded inside the module
3	TX_DISABLE	Transmitter Disable (LVTTL-I) – High or open disables the transmitter
4	SDA	Two Wire Serial Interface Data Line (LVCMOS – I/O)
5	SCL	Two Wire Serial Interface Clock Line (LVCMOS – I/O)
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module
7	RS0	Rate Select 0 - Not used, Presents high input impedance.

8	RX_LOS	Receiver Loss of Signal (LVTTL-O)
9	RS1	Rate Select 1 - Not used, Presents high input impedance.
10	VeeR	Receiver Signal Ground
11	VeeR	Receiver Signal Ground
12	RD-	Receiver Data Out Inverted (CML-O)
13	RD+	Receiver Data Out (CML-O)
14	VeeR	Receiver Signal Ground
15	VccR	Receiver Power + 3.3 V
16	VccT	Transmitter Power + 3.3 V
17	VeeT	Transmitter Signal Ground
18	TD+	Transmitter Data In (CML-I)
19	TD-	Transmitter Data In Inverted (CML-I)
20	VeeT	Transmitter Signal Ground

Mechanical Specifications



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	

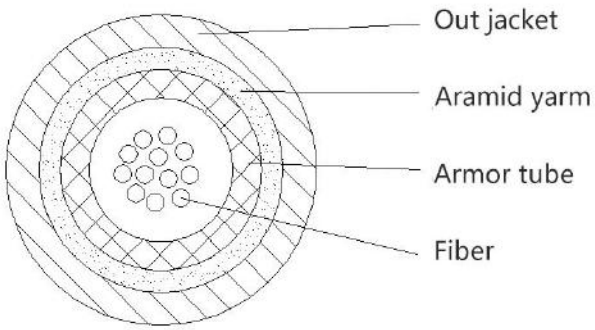
AOC product bagging circle size:

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, blown, 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
TSQ4S-85G-XXXD	40G QSFP+ TO 4x10G SFP+ Armored AOC 0°C ~ +70°C
TSQ4S-85G-XXXU	40G QSFP+ TO 4x10G SFP+ Armored AOC -40°C ~ +85°C

XXX :001~082,1~82 Length in meters on OM2 MMF

XXX :001~300,1~300 Length in meters on OM3 MMF

Important Notice

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