

# Alpha Bridge AQS56-T-2.5-PEV Datasheet



### Features

- Up to 200Gb/s data rate
- 4x25Gb/s PAM4 modulation
- Compliant with SFF-8665 and SFF-8436
- Compliant with IEEE802.3cd / Infiniband HDR
- Hot-pluggable
- Power consumption <0.1W
- RoHS compliant
- Operating temperature range: 0°C to 70°C

### Application

- 200G / 100G Ethernet
- Infiniband HDR

### Description

The AQS56-T-xx-PxL QSFP56 passive cable assemblies are high performance, cost effective I/O solutions for 200G Ethernet. QSFP56 copper cables allow hardware manufactures to achieve high port density, configurability and utilization at a very low cost and reduced power budget.

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	<i>TS</i>	-40		85	°C
Operating Case Temperature	<i>TOP</i>	0		70	°C
Supply Voltage	<i>VCC3</i>	3.135		3.465	V
Relative Humidity (non-condensation)	<i>RH</i>	5		85	%

### Recommended Operating Conditions & Power Supply Requirements

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Case Temperature	<i>TOP</i>	0		70	°C
Power Supply Voltage	<i>VCC</i>	3.135	3.3	3.465	V
Power Consumption				0.01	W
Power Supply Current	<i>Icc3</i>	0.001			mA

### Frequency Domain

S.no	Test Parameter	IEEE802.3cd Specification
1	Differential Insertion Loss (SDD21)  Differential Return Loss (SDD22)	Maximum insertion loss at 13.28Ghz -17.16dB Minimum insertion loss at 13.28Ghz -8dB  -16.5+2xSQRT(f) @ 0.01 to 4.1GHz -10.66+14xLog10(f/5.5) @4.1 to 19GHz

2	Differential Return Loss (SDD11)	-16.5+2xSQRT(f) @ 0.01 to 4.1GHz -10.66+14xLog10(f/5.5) @ 4.1 to 19GHz
3	Common Mode Reflection (SCC22)	-2dB @ 0.01 to 19GHz
4	Common Mode Reflection (SCC11)	-2dB @ 0.01 to 19GHz
5	Common Mode Conversion (SCD22)	-22+(20/25.78)*(f) @ 0.01 to 12.89GHz -15+(6/25.78)*(f) @ 12.9 to 19GHz
6	Common Mode Conversion (SCD11)	-22+(20/25.78)*(f) @ 0.01 to 12.89GHz -15+(6/25.78)*(f) @ 12.9 to 19GHz
7	Differential to Common Mode Conversion Loss (SCD12)	-10dB @ 0.01 to 12.89GHz -27+(29/22)*(f) @ 12.9 to 15.7GHz -6.3dB @ 15.71 to 19GHz
8	Differential to Common Mode Conversion Loss (SCD21)	-10dB @ 0.01 to 12.89GHz -27+(29/22)*(f) @ 12.9 to 15.7GHz -6.3db @ 15.71 to 19GHz
9	Channel Operating Margin (COM)	3db Minimum

### Time Domain

Item	Test Parameter	IEEE802.3cd Specification
1	Intra-Skew* 1M 1.5M-2M 2.5M-3M	20ps Max 25ps Max 30ps Max
2	Impedance Rise time: 35ps (20%-80%)	100 +/- 10 Ohm
3	Insertion Loss* (SDD21) for 1M 30awg	13.28GHz - -12.5 dB Max
4	Insertion Loss* (SDD21) for 1.5M 30awg	13.28GHz - -14.5 dB Max
5	Insertion Loss* (SDD21) for 2M 30awg	13.28GHz - -16.5 dB Max
6	Insertion Loss* (SDD21) for 2.5M 28awg	13.28GHz - -16.0 dB Max
7	Insertion Loss* (SDD21) for 3M 26awg	13.28GHz - -16.8 dB Max

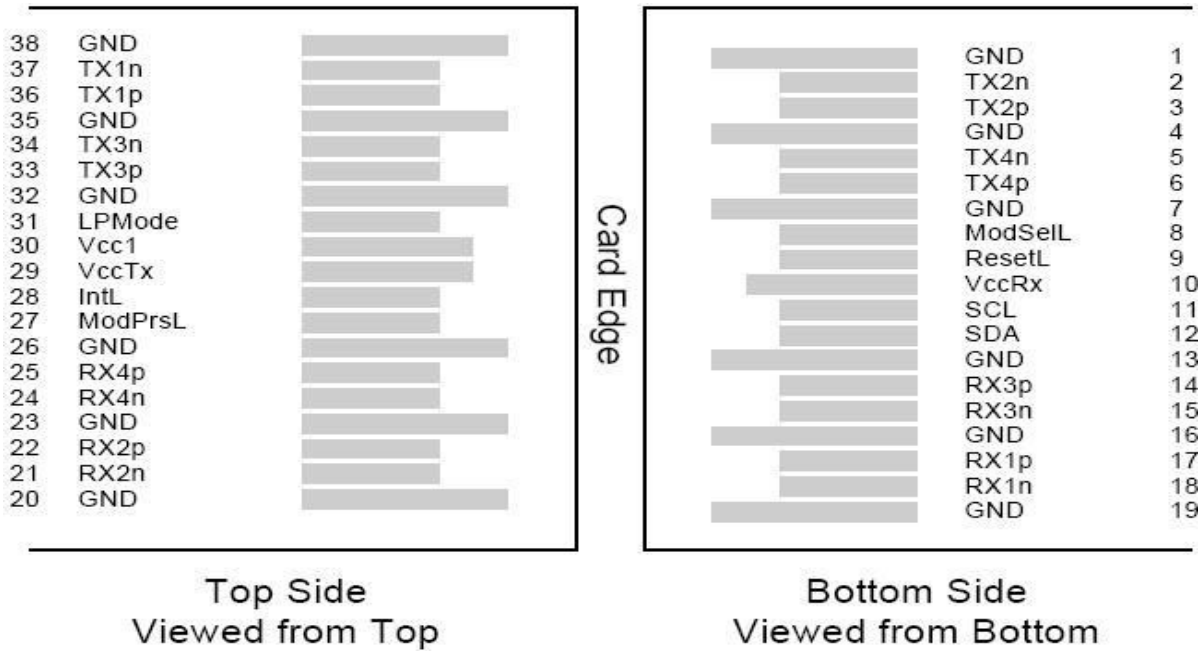
### Pin Description

Pin	Logic	Symbol	Description	Plug Sequenc	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted DataInput	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted DataInput	3	

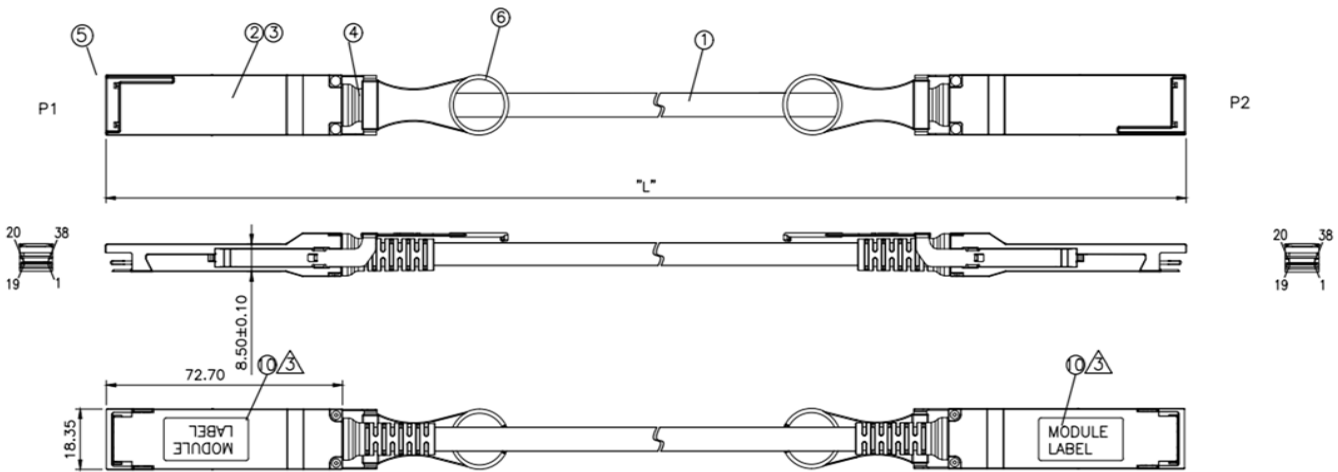
7		GND	Ground	1	1
8	LVTTTL-I	ModSelL	Module Select	3	
9	LVTTTL-I	ResetL	Module Reset	3	
10		Vcc Rx	+3.3V Power Supply Receiver	2	
11	LVC MOSI/O	SCL	2-wire serial interface clock	3	2
12	LVC MOSI/O	SDA	2-wire serial interface data	3	2
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16			Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTTL-O	ModPrsL	Module Present	3	2
28	LVTTTL-O	IntL	Interrupt	3	2
29		Vcc Tx	+3.3V Power Supply transmitter	2	
30		Vcc1	+3.3V Power Supply	2	
31	LVTTTL-I	LPMODE	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

1. GND is the symbol for signal and supply (power) common for the module. All are common within the module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in SFF-8679 Table 5-6. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the module in any combination. The connector pins are each rated for a maximum current of 1000 mA.

Pin Assignment



Dimensions



Ordering Information

Model Number	Part Number	AWG	Length	Temperature
200G QSF56 DAC-2.5M	AQS56-T-2.5-PCV	28	2.5M	0°C to 70°C

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