

#### QSFP-H40G-AOC15M-PRO

Cisco® QSFP-H40G-AOC15M Compatible TAA 40GBase-AOC QSFP+ to QSFP+ Active Optical Cable (850nm, MMF, 15m)

#### **Features**

- Support up to 4x10 Gbps bi-directional operation
- Compliant to the IEEE802.3ba
- SFF-8436 QSFP+ compliant
- Reliable VCSEL and PIN photonic devices
- I2C standard management interface
- Automatic power down while broken cable is detected to improve eye safety
- Low power consumption
- Excellent high speed signal integrity
- RoHS Compliant and Lead-Free
- Operating Case Temperature 0 to 70 Celsius



### **Applications:**

- 10G/40GBase Ethernet
- Proprietary high speed, high density data
- High performance computing, server and data storage

### **Product Description**

This is a Cisco® QSFP-H40G-AOC15M Compatible 40GBase-AOC QSFP+ to QSFP+ active optical cable that operates over active fiber with a maximum reach of 15m. It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. We stand behind the quality of our products and proudly offer a limited lifetime warranty. This cable is TAA (Trade Agreements Act) compliant and is built to comply with MSA (Multi-Source Agreement) standards.

Proline's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products.



# **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Тур.	Max.	Unit
Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	Tstg	-40		85	°C
Operating Case Temperature	Тс	0	25	70	°C
Relative Humidity	RH	5		85	%
Data Rate Per Channel			4*10.3		Gbps

# **Electrical Specifications**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Supply Current	Icc			400	mA	
Power Dissipation	P <sub>DISS</sub>			1500	mW	
Clock Rate - I2C				400	KHz	1
Module Turn-on time				2000	ms	2

## Notes:

- 1. For the management interface.
- 2. Time from module power-on/insertion/ResetL de-assert to module fully functional.

# **Optical Characteristics**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Transmitter						
Reference Differential Input	Zd		100		Ω	1
Optical Return Loss Tolerance				12	dB	
Differential Data Input Swing	VIN,pp	180		1200	mV	
Differential Data Input Threshold			50		mV	2
Receiver						
Reference Differential Input Impedance	Zd		100		Ω	1
Differential Data Output Swing	VOUT,pp	0		800	mV	
Pre-Emphasis Pulse Amplitude		0			%	4
Percentage		10			%	
		20			%	
		40			%	
Pre-Emphasis Pulse Duration			30		ps	
Signal Speed			4*10.3		Gbps	
Differential Data Output Swing		150		850	mV	
Differential Data Output Swing When Squelched				50	mV	
Rise/Fall Time (20-80%)		24			ps	

### Notes:

- 1. AC coupled inside the AOC module.
- 2. Input swing to trigger Tx-squelch.
- 3. User selectable. Percentage is the ratio of pre-emphasis amplitude to output swing. Users could change by writing to page 3 address 237, default value is "10."

**Pin Descriptions** 

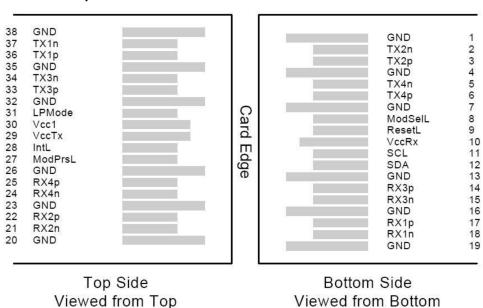
Pin	escriptions Logic	Symbol	Name/Description	Note
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	
7		GND	Module Ground.	1
8	LVTTL-I	ModSelL	Module Select.	2
9	LVTTL-I	ResetL	Module Reset.	2
10		VccRx	+3.3V Receiver Power Supply.	
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	2
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	2
13		GND	Module Ground.	1
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	
15	CML-O	Rx3-	Receiver Inverted Data Output.	
16		GND	Module Ground.	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	
18	CML-O	Rx1-	Receiver Inverted Data Output.	
19		GND	Module Ground.	1
20		GND	Module Ground.	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	
23		GND	Module Ground.	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Module Ground.	1
27	LVTTL-O	ModPrsL	Module Present. Internally pulled down to the GND.	
28	LVTTL-O	IntL	Interrupt output should be pulled up on the host board.	2
29		VccTx	+3.3V Transmitter Power Supply.	
30		Vcc1	+3.3V Power Supply.	
31	LVTTL-I	LPMode	Low-Power Mode.	2
32		GND	Module Ground.	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	
34	CML-I	Tx3-	Transmitter Inverted Data Input.	
35		GND	Module Ground.	1

36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	
37	CML-I	Tx1-	Transmitter Inverted Data Input.	

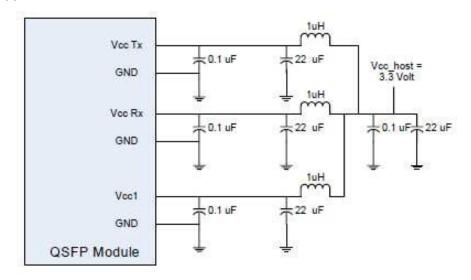
### Notes:

- 1. GND is the symbol for signal and supply (power). Connect these directly to the host board signal common ground plane.
- 2. VccRx, Vcc1, and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP+. The connector pins are each rated for a maximum current of 500mA.

## Pin Assignment and Pin Description

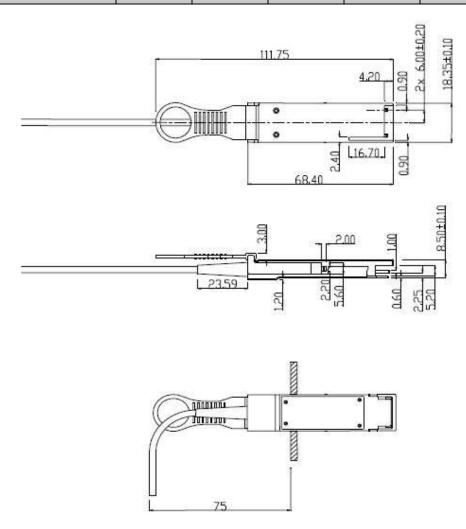


## **Recommended Application Interface Circuit**



# **Mechanical Specifications**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
AOC Cable Length (L<5m)	L	L-0.06	L	L+0.06	М	
Module Retention		90		170	N	
Module Insertion		0		18	N	
Module Extraction		0		25	N	
Cable Pull Strength – Apply Load at 0°		44			N	
Cable Pull Strength – Apply Load at 90°		33			N	
Clearance Out of IO Bezel		75			nm	
Cable Bending Radius		3			cm	
Insertion/Removal Cycles		50			Cycles	



Clearance 75mm Is Required.

Cable Type: Low Smoke Zero Halogen

### **About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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