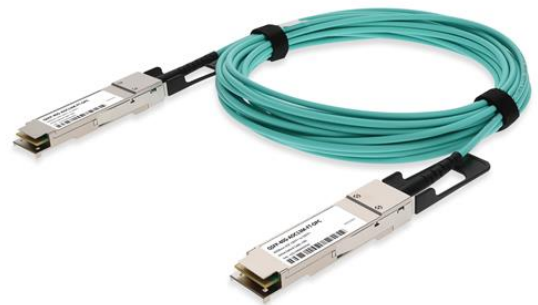


QSFP-40G-AOC13M-FT-OPC

Fortinet® Compatible TAA 40GBase-AOC QSFP Transceiver (Active Optical Cable, 13m, DOM)

Features

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



Applications:

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

Product Description

This is an Fortinet® compatible 40GBase-AOC QSFP+ to QSFP+ active optical cable that operates over multi-mode fiber with a maximum reach of zzz. At a wavelength of 850nm, it has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This active optical cable is TAA (Trade Agreements Act) compliant, and is built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V _{CC}	-0.5		3.6	V
Storage Temperature	T _{stg}	-40		85	°C
Operating Case Temperature	T _c	0	25	70	°C
Relative Humidity	RH	5		85	%
Data Rate Per Channel			4*10.3		Gbps

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Supply Current	I _{CC}			400	mA	
Power Dissipation	P _{DISS}			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.	Typ.	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 Percentage		0			%	4
		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

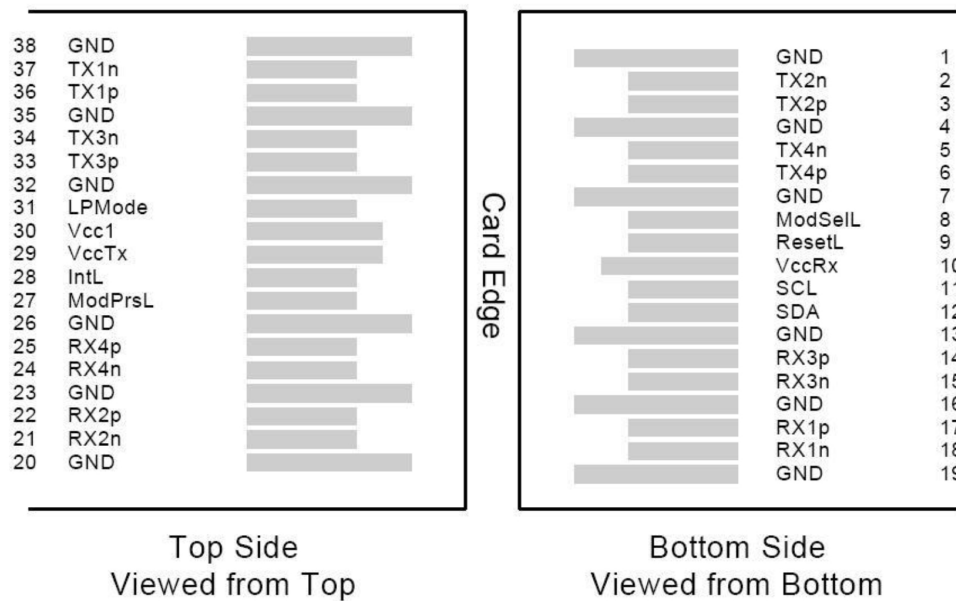
Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Input.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Input.	
7		GND	Module Ground.	1
8	LVTTL-I	ModSelL	Module Select.	2
9	LVTTL-I	ResetL	Module Reset.	2
10		VccRx	+3.3V Receiver Power Supply.	
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	2
12	LVC MOS-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.	

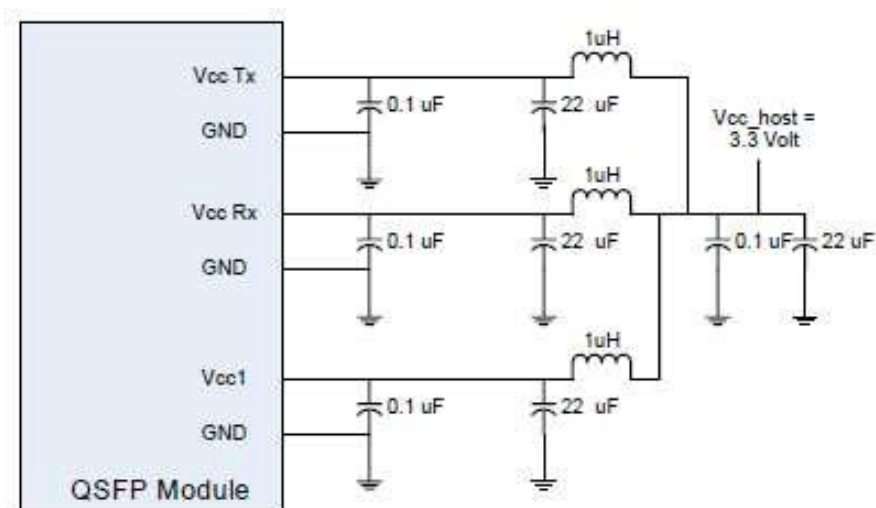
Notes:

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

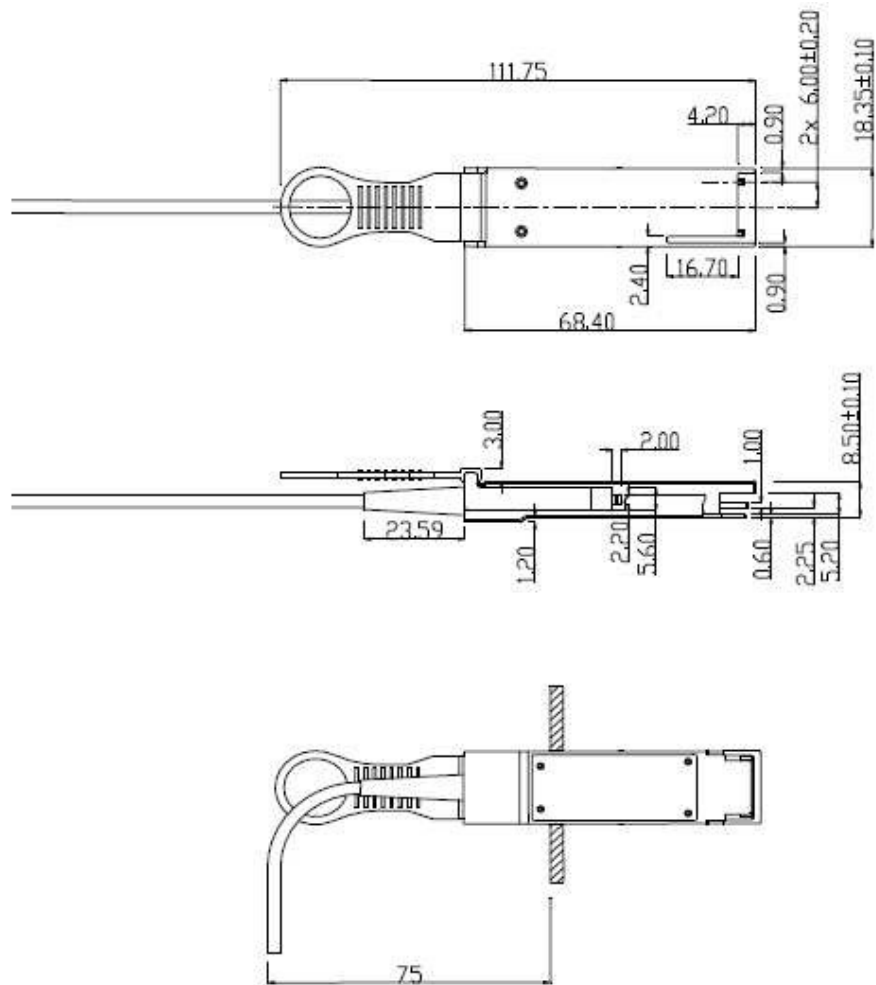


Recommended Application Interface Circuit



Mechanical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
AOC Cable Length (L<5m)	L	L-0.06	L	L+0.06	M	
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			mm	
Cable Bending Radius		3			cm	
Insertion/Removal Cycles		50			Cycles	



Clearance 75mm Is Required.
Cable Type: Low Smoke Zero Halogen