

# AOC-100G-xM

## Active Optical Cable

100G QSFP28 Active Optical Cable, AOC MMF 850nm 1-100m



### Features

- 4 high-speed full duplex channels
- Supports 103.1Gb/s aggregate bit rate
- 4x25Gbps 850nm VCSEL laser
- Available in lengths of 1 to 100 meters
- Hot-pluggable QSFP28 form factor
- QSFP28 MSA compliant
- Low power dissipation:<3.5W per cable end(<2.5W with CDRs off)
- Operating environment temperature 0 ~ 70°C

### Application

- 100 Gigabit Ethernet links
- Infiniband interconnect
- Data center cabling infrastructure
- High density connections between networking equipment

### Standard

- SFF-8431 SFP+ Electrical MSA
- SFF-8432 SFP+ Mechanical MSA
- RoHS complaint

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T <sub>s</sub>	-40	+85	°C
Operating Humidity	RH	0	85	%
Supply Voltage	V <sub>cc</sub>	-0.5	4.0	V

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T <sub>c</sub>	0		+70	°C
Supply Voltage	V <sub>cc</sub>	3.14	3.3	3.46	V
Supply Current	I <sub>cc</sub>			300	mA
Data Rate	BR		25.78		Each channel

## Electrical Characteristics

Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Transmitter Characteristics</b>						
Signaling rate, each lane	DRpl		25.78125		Gb/s	1
Center Wavelength	$\lambda$	840	850	860	nm	
RMS Spectral Width			0.6		nm	
Average launch power, each lane	P <sub>avg</sub>	-8.4		2.4	dBm	
Optical modulation amplitude, each lane (OMA)	OMA	-6.4		3	dBm	
Extinction ratio	ER	2			dB	
Average Launch Power of OFF Transmitter, per Lane	RIN			-30	dBm	
Encircled Flux	FLX	>86% at 19 $\mu$ m <30% at 4.5 $\mu$ m			dBm	
Optical return loss tolerance				12	dB	
Transmitter eye mask {X1, X2, X3, Y1, Y2, Y3}		{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}				2
<b>Receiver Characteristics</b>						
Receive Rate for Each Lane	DRpl		25.78125		Gb/s	3
Four Lane Wavelength Range	$\lambda$	840	850	860	nm	
Overload Input Optical Power	P <sub>max</sub>	3.4			dBm	

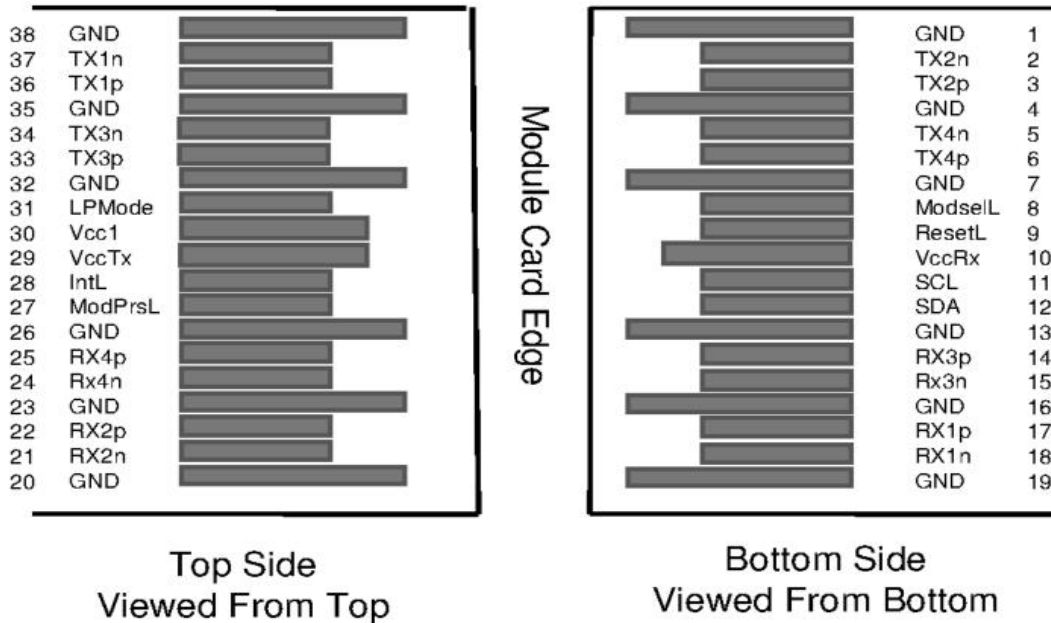
Average Receive Power for Each Lane	Pin	-10.3		2.4	dBm	4
Receiver Sensitivity(OMA) per lane	Psens		-5.2		dB	
Receiver Reflectance	Rfl			-12	dB	
Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.28,0.5,0.5,0.33,0.33,0.4}				5
Los De-Assert	Pd			-13	dBm	
Los Assert	Pa	-30			dBm	
Loss Hysteresis	Pd-Pa	0.5			dBm	

**Notes:**

1. Transmitter consists of 4 lasers operating at a maximum speed of 25.78125Gb/s  $\pm$ 100ppm each.
2. Hit Ratio 1.5 x 10<sup>-3</sup> hits/sample.
3. Receiver consists of 4 photodetectors operating at a maximum speed of 25.78125Gb/s  $\pm$ 100ppm each.
4. Minimum value is informative only and not the principal indicator of signal strength.
5. Hit Ratio 5 x 10<sup>-5</sup> hits/sample.

## Pin Descriptions

The SFP+ modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The SFP+ host connector is a 0.8 mm pitch 20 position right angle improved connector specified by SFF-8431, or stacked connector with equivalent electrical performance. SFP+ module contacts mates with the host in the order of ground, power.



Pin	Symbol	Name/Description	Logic	Note
1	GND	Transmitter Ground(Common with Receiver Ground)	1	GND
2	TX2N	Transmitter Inverted Data Input		TX2N
3	TX2P	Transmitter Non-Inverted Data Input		TX2P
4	GND	Ground	1	GND
5	TX4N	Transmitter Inverted Data Input		TX4N
6	TX4P	Transmitter Non-Inverted Data Input		TX4P
7	GND	Ground	1	GND
8	ModSelL	Module Select		ModSelL
9	ResetL	Module Reset		ResetL
10	Vcc Rx	+3.3 V Power supply receiver	2	Vcc Rx
11	SCL	2-wire serial interface clock		SCL
12	SDA	2-wire serial interface data		SDA
13	GND	Ground		GND
14	RX3P	Receiver Non-Inverted Data Output		RX3P
15	RX3N	Receiver Inverted Data Output		RX3N
16	GND	Ground	1	GND
17	RX1P	Receiver Non-Inverted Data Output		RX1P

18	RX1N	Receiver Inverted Data Output		RX1N
19	GND	Ground	1	GND
20	GND	Ground	1	GND
21	RX2N	Receiver Inverted Data Output		RX2N
22	RX2P	Receiver Non-Inverted Data Output		RX2P
23	GND	Ground	1	GND
24	RX4N	Receiver Inverted Data Output	1	RX4N
25	RX4P	Receiver Non-Inverted Data Output		RX4P
26	GND	Ground	1	GND
27	ModPrsL	Module Present		ModPrsL
28	IntL	Interrupt		IntL
29	Vcc Tx	+3.3 V Power supply transmitter	2	Vcc Tx
30	Vcc1	+3.3 V Power Supply	2	Vcc1
31	LPMoDe	Low Power Mode		LPMoDe
32	GND	Ground	1	GND
33	TX3P	Transmitter Non-Inverted Data Input		TX3P
34	TX3N	Transmitter Inverted Data input		TX3N
35	GND	Ground	1	GND
36	TX1P	Transmitter Non-Inverted Data Input		TX1P
37	TX1N	Transmitter Inverted Data input		TX1N
38	GND	Ground	1	GND

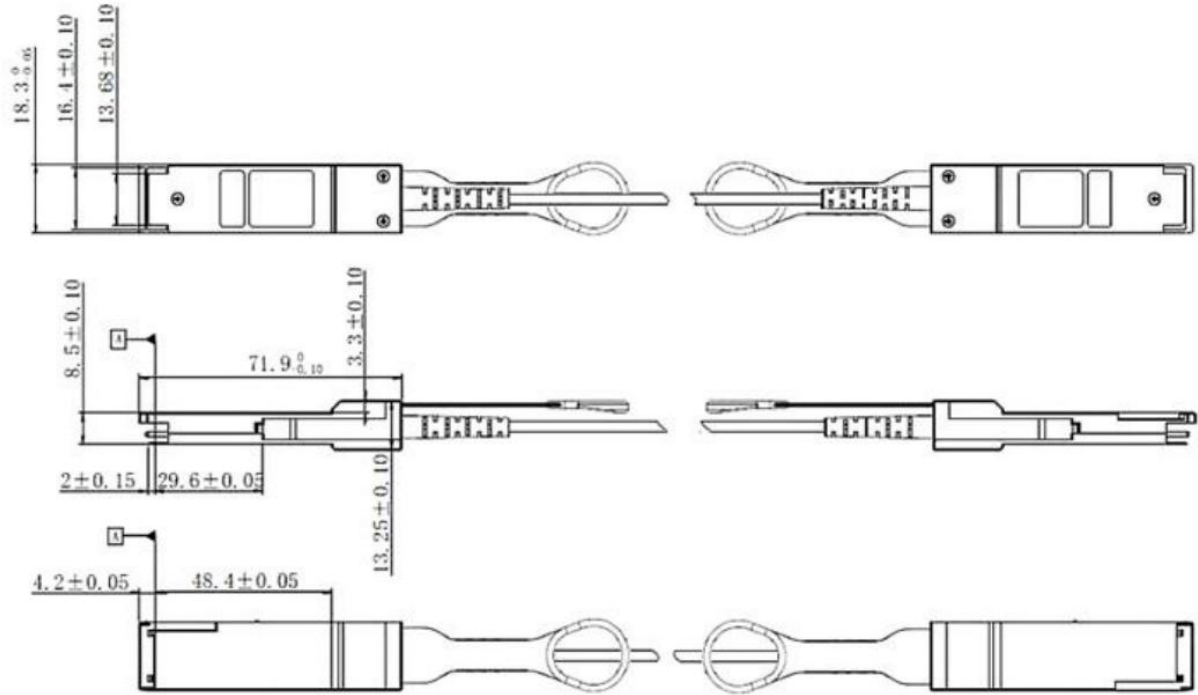
**Notes:**

Plug Seq.: Pin engagement sequence during hot plugging.

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 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. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 3 below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

## Mechanical Dimensions

Dimensions are in millimeters. All dimensions are  $\pm 0.2\text{mm}$  unless otherwise specified. (unit: mm)



## Ordering information

Model No.	Product Description
AOC-100G-xM	100G QSFP28 to QSFP28 Active Optical Cable 1-100m
x: 001~100 meters	



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