QSFPDD-400G-AOC10M-AO

MSA and TAA Compliant 400GBase-AOC QSFP-DD to QSFP-DD Active Optical Cable (850nm, MMF, 10m)

Features

- Multi-rate capabilities: Up to 400Gbps
- QSFP-DD Form Factor
- Hot-Pluggable Active Cable
- 10m Length
- 8x50Gbps PAM4 Modulation
- Jacket Cable LSZH
- CMIS 3.1 Compliant I^2C Interface
- Power: 10W Typical per Cable End
- ROHS-6 Compliant

Applications

- 50/200/400G Ethernet

Product Description

This is an MSA compliant 400GBase-AOC QSFP-DD to QSFP-DD active optical cable that operates over active fiber with a maximum reach of 10m. 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.

AddOn's QSFP-DD active optical cables 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."

Regulatory Compliance

Certification	Standard
Laser Eye Safety	IEC: 60825-1, 3rd Edition FDA: CFR-21 Sections 1040.10 and 1040.11
Product Safety	TUV: EN62368-1 UL/CSA 60950-1
EMC/EMI	FCC: Part 15 sb.B EN: 55032/55024

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max.	Unit
Supply Voltage	Vcc, Vcc2, VccTx, VccTx1, VccRx, VccRx1	-0.5		3.6	V
Storage Temperature	Ts	-10		85	°C
Storage Humidity (non-Condensation)	RHU	5		85	%
Differential Max. Input Voltage	Vin-diff-maxd			1600	mV

Recommended Operating Conditions

Parameter	Symbol	Min	Typ.	Max.	Unit
Supply Voltage	Vcc, Vcc2, VccTx, VccTx1, VccRx, VccRx1		3.3		V
Case Operating Temperature	Top	0		70	°C
Module Total Power	PTOT		10		W
Operating Humidity	RH	5		85	%
Signaling Rate Per Lane	FD		53.125		Gb/s

General Characteristics

Parameter	Symbol	Unit	Notes
Module Form Factor	QSFP-DD Type 1		QSFP-DD MSA Hardware Rev. 4.0
Number of Lanes	8 Tx, 8 Rx		
Maximum Aggregate Data Rate	425	Gb/s	
Maximum Data Rate per Lane	53.125	Gb/s	
Protocols Supported	50GbE, 200GbE, 400GbE		
Electrical Interface and Pin-Out	8x50G PAM4, 8x25G NRZ 76-pin Edge Connector		
Management Interface	Serial, I^2C based, 400KHz Max		CMIS Rev. 3.1 compliant

Electrical and Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Supply voltage	Vcc	3.135	3.3	3.465	V	
Supply Current, per cable end	Icc				mA	
Power Dissipation, per cable end	P		10		W	
Latency	TL		TBD		ms	
Bit Error Rate (Pre-FEC)	BER		< $1E^{-8}$	$5E^{-}$05		
Transmit High Speed Electrical Specifications						
High Speed Differential Termination Resistance	ZTERMio		100		Ω	
Differential Voltage	Vin_pp			1600	mVpp	
Input Differential Return loss	SDD11	Compliant to IEEE 802.3bs			dB	
Receive High Speed Electrical Specifications						
Signaling rate per lane			53.125		Gb/s	
High Speed Differential Termination Resistance	ZTERMio		100		Ω	
Differential output swing	Vout_pp			900	mVpp	
Output rise/fall time (20-80%)				TBD	ps	
Low Speed Electrical Specifications						
Output Logic High (SCL, SDA)	VOH	Vcc-0.5		Vcc+0.3	V	
Output Logic Low (SCL, SDA)	VOL	0		0.4	V	
Input Logic High (SCL, SDA)	VIH	Vcc*0.7		Vcc+0.5	V	
Input Logic Low (SCL, SDA)	VIL	-0.3		Vcc*0.3	V	
Output Logic High (IntL)	VOH	Vcc-0.5		Vcc+0.3	V	
Output Logic Low (ModPrsL, IntL)	VOL	0		0.4	V	
Input Logic High (InitMode, Reset, ModSelL)	VIH	2		vcc+0.3	V	
Input Logic Low (InitMode, Reset, ModSelL)	VIL	-0.3		0.8	V	

Pin Descriptions

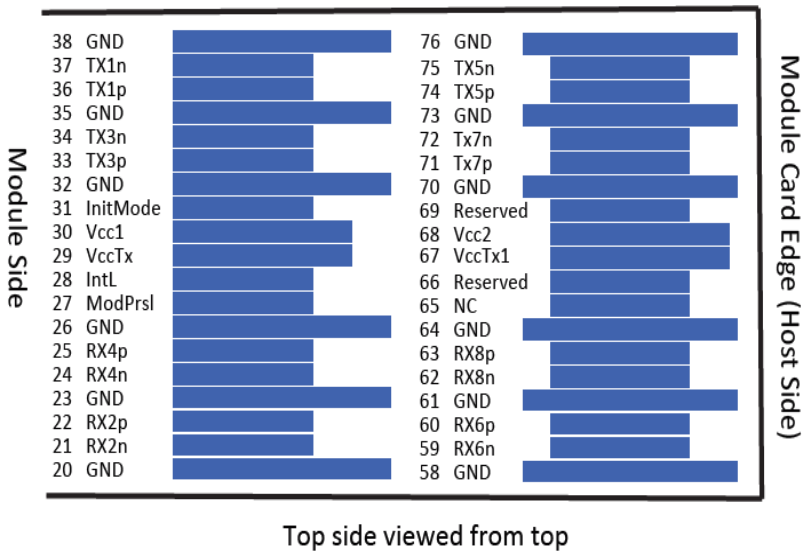
PIN	Logic	Symbol	Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-wire Serial Interface Data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3V Power Supply Transmitter	2
30		Vcc1	+3.3V Power Supply	2
31	LVTTL-I	InitMode	Initialization mode	
32		GND	Ground	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1

PIN		Symbol	Description	Notes
39		GND	Ground	1
40	CML-I	Tx6n	Transmitter Inverted Data Input	
41	CML-I	Tx6p	Transmitter Non-Inverted Data Input	
42		GND	Ground	1
43	CML-I	Tx8n	Transmitter Inverted Data Input	
44	CML-I	Tx8p	Transmitter Non-Inverted Data Input	
45		Reserved		
46		VS1	Module Vendor Specific 1	3
47		VccRx1	3.3V Power Supply	2
48		VS2	Module Vendor Specific 2	3
49		VS3	Module Vendor Specific 3	3
50		GND	Ground	1
51	CML-O	Rx7p	Receiver Non-Inverted Data Output	
52	CML-O	Rx7n	Receiver Inverted Data Output	
53		GND	Ground	1
54	CML-O	Rx5p	Receiver Non-Inverted Data Output	
55	CML-O	Rx5n	Receiver Inverted Data Output	
56		GND	Ground	1
57		GND	Ground	1
58	CML-O	Rx6n	Receiver Inverted Data Output	
59	CML-O	Rx6p	Receiver Non-Inverted Data Output	
60		GND	Ground	1
61	CML-O	Rx8n	Receiver Inverted Data Output	
62	CML-O	Rx8p	Receiver Non-Inverted Data Output	
63		GND	Ground	1
64		NC	No Connect	1
65		Reserved		3
66		VccTx1	3.3V Power Supply	2
67		Vcc2	3.3V Power Supply	2
68		Reserved		3
69		GND	Ground	1
70	CML-I	Tx7p	Transmitter Non-Inverted Data Input	
71	CML-I	Tx7n	Transmitter Inverted Data Input	
72		GND	Ground	1
73	CML-I	Tx5p	Transmitter Non-Inverted Data Input	
74	CML-I	Tx5n	Transmitter Inverted Data Input	
75		GND	Ground	1
76		Reserved		

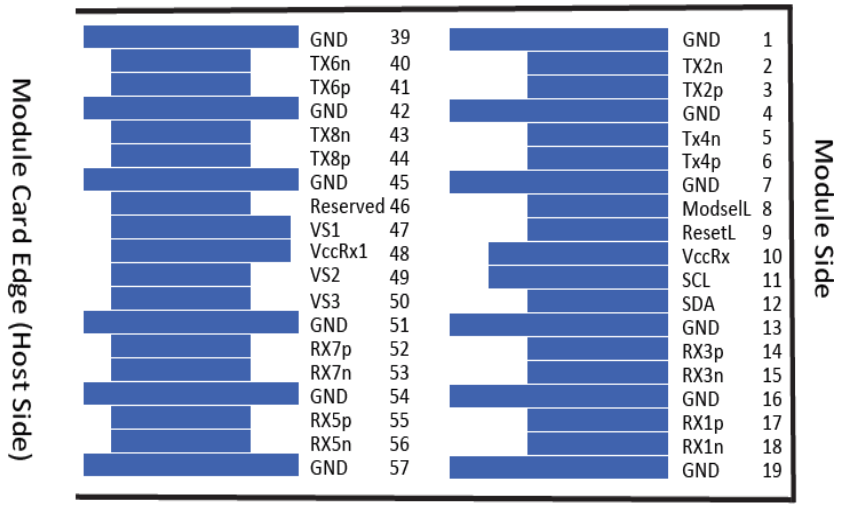
Notes:

1. QSFP-DD uses common ground (GND) for all signals and supply (power). All are common within the QSFP-DD 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, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently.
3. All vendor specific, Reserved and No Connect pins may be terminated with 50Ω to ground on the host. Pad 65 (NC) shall be left unconnected within the module. Vendor specific and Reserved pads shall have an impedance to GND that is greater than 10 KΩ and less than 100pF

Electrical Pin-out Details

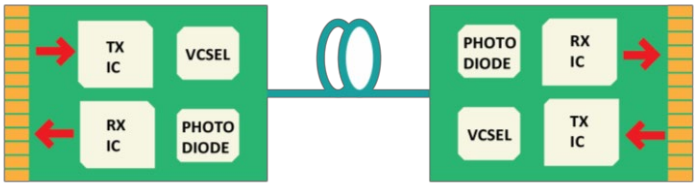


Top side viewed from top



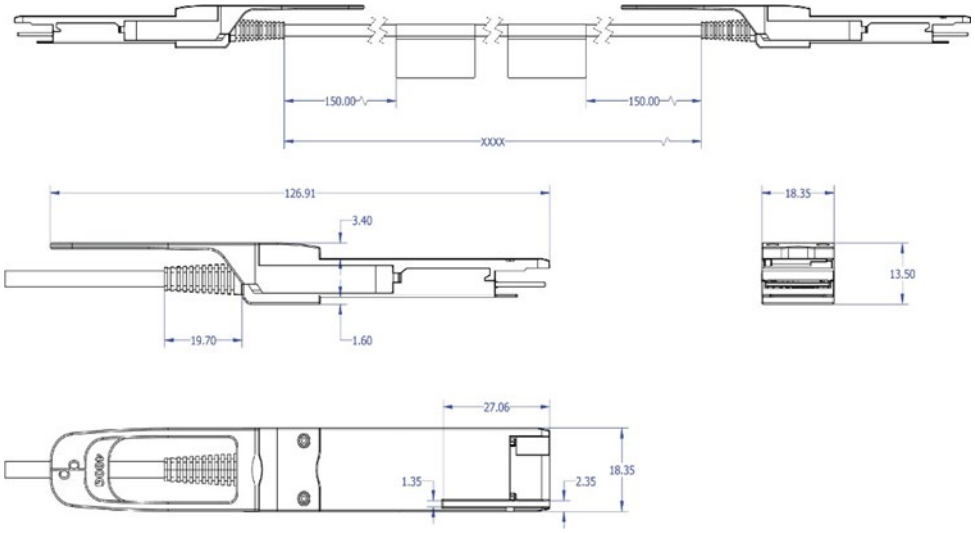
Bottom side viewed from bottom

Block Diagram



Mechanical Specifications

The 400G QSFP-DD AOC mechanical specifications are compliant with the QSFP-DD transceiver module specifications (as defined in QSFP-DD MSA), substituting the MPO receptacle with a fiber optics cable connecting both ends.



About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is in engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

U.S. Headquarters

Email: sales@addonnetworks.com

Telephone: +1 877.292.1701

Fax: 949.266.9273

Europe Headquarters

Email: salessupportemea@addonnetworks.com

Telephone: +44 1285 842070