QSFP-40G-AOCxM

40G QSFP+ to QSFP+ Active Optical Cable (AOC), 1~300 meters

Features

- Compliant to industrial standard QSFP+ MSA SFF-8436
- Compliant to the IEEE802.3ba (40GBASE-SR4)
- High speed/high density: support up to 4×10 Gb/s bi-directional operation
- Maximum 1.5W operation power
- Reliable VCSEL and PIN photonic devices
- Excellent high speed signal integrity
- Low weight for high-port-count architectures
- Small cable bend radius
- Available in lengths of 1 to 300m
- RoHS-6 compliant
- Operating temperature range: 0 to 70°C

Applications

- 40 Gigabit Ethernet links
- Fiber Channel over Ethernet
- Data storage and communication industry
- Switches, servers,routers and HBA
- Enterprise network
- SAN (Storage area networks)
- Data center cabling infrastructure
- High density connections between networking equipment

Description

Optcore's QSFP-40G-AOCxM family are QSFP+ active optical cables (AOC) for 40G Ethernet (40GbE) and Infiniband QDR applications. The 40G QSFP+ AOC cables provide an ideal alternative solution to QSFP+ direct attach copper cables (DAC) and QSFP+ transceivers of short reach while improving signal integrity, premium cost, and performance value. They are designed for high speed, high density, and low power consumption for today's data center networking applications.

The QSFP+ AOC cables are composed of QSFP+ transceivers in both ends and OM3 multimode fiber cable in different cable lengths from 1 to 300 meters. They offer four independent data transmission channels and 4 data receiving channels via the multimode fibers. This product can achieve an aggregate data rate of 40 Gbps. The QSFP+ AOC is one kind of parallel transceiver that provides increased port density and total system cost savings.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature	T_S	-40	85	°C	

Operating Humidity	RH	5	95	%	

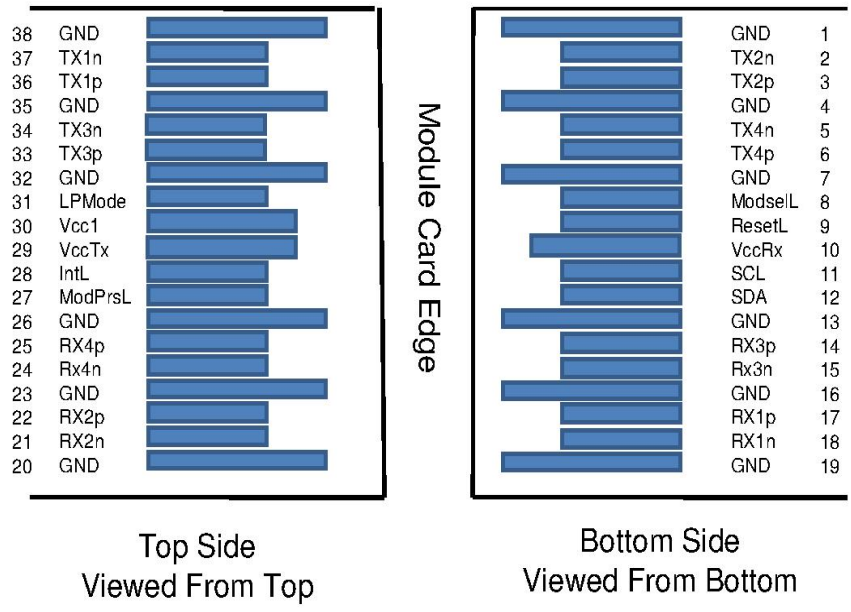
Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Dissipation	Pm			1.5	W	
Case Operating Temperature	Tc	0		70	°C	
Data Rate			10.3	10.5	Gbps	Each channel
Bit Error Rate	BER			10^{-12}		
Fiber Bend Radius	Rb	3			cm	

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λc	840	850	860	nm	
RMS spectral width	Δλ	-	-	0.65	nm	
Average launch power, each lane	P_{out}	-7.5		2.5	dBm	
Optical Modulation Amplitude, each lane	P_{oma}	-5.6		3	dBm	
Extinction Ratio	ER	3.0			dB	
Average launch power of OFF transmitter,each lane	P_{off}			-30	dBm	
Receiver						
Centre Wavelength	λc	840	850	860	nm	
Average power at receiver input,each lane		-9.5		2.4	dBm	
Optical Modulation Amplitude(OMA),each lane				3	dBm	
Stressed receiver sensitivity in OMA,each lane				-5.4	dBm	
Receiver Reflectance				-12	dB	
LOS De-Assert– OMA	LOS_D			-7.5	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis		0.5			dB	

Electrical Pad Layout



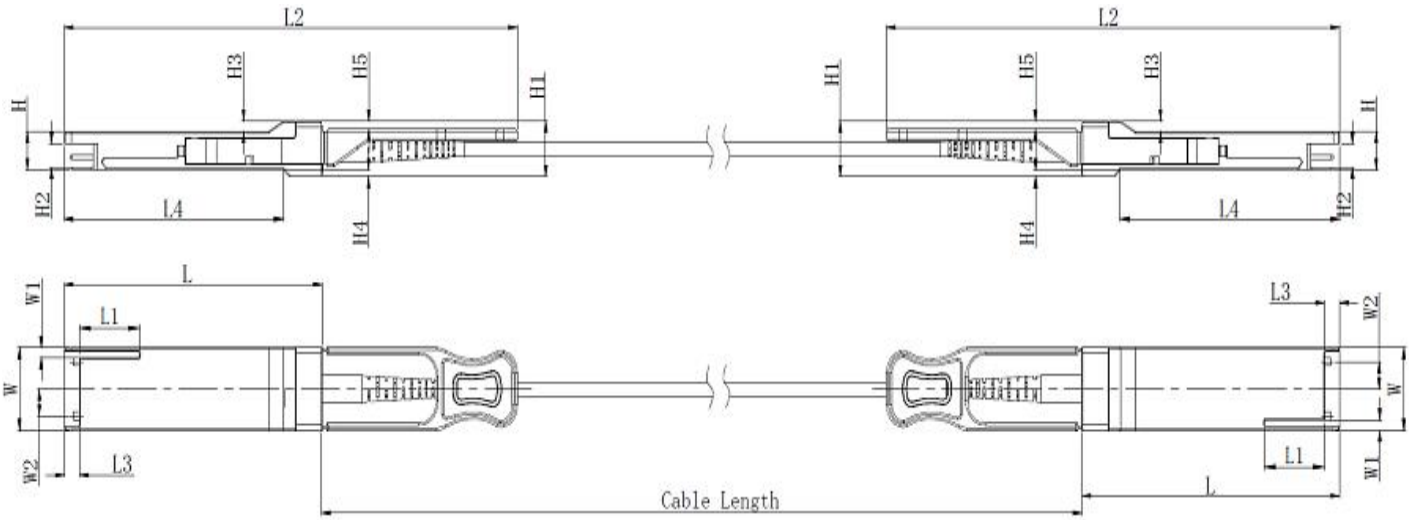
Pin Definitions

Pin	Logic	Symbol	Description
1		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input
4		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input
7		GND	Ground
8	LVTTL-I	ModSelL	Module Select
9	LVTTL-I	ResetL	Module Reset
10		Vcc Rx	+3.3V Power Supply Receiver
11	LVCMOS-I/O	SCL	2-wire serial interface clock
12	LVCMOS-I/O	SDA	2-wire serial interface data
13		GND	Ground
14	CML-O	Rx3p	Receiver Non-Inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output
16		GND	Ground
17	CML-O	Rx1p	Receiver Non-Inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data Output
19		GND	Ground
20		GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-Inverted Data Output
23		GND	Ground

24	CML-O	Rx4n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-Inverted Data Output
26		GND	Ground
27	LVTTL-O	ModPrsL	Module Present
28	LVTTL-O	IntL	Interrupt
29		Vcc Tx	+3.3V Power supply transmitter
30		Vcc1	+3.3V Power supply
31	LVTTL-I	LPMode	Low Power Mode
32		GND	Ground
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground

Mechanical Dimensions

The connector is compatible with the SFF-8436 specification. *(Unit: mm)*



Unit mm

	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5
Max	72.2	-	128	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2.0
Type	72.0	-	-	4.20	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8
Min	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6

Ordering information

Part number	Description
QSFP-40G-AOC1M	40G QSFP+ AOC (Active Optical Cable), 1M
QSFP-40G-AOC2M	40G QSFP+ AOC (Active Optical Cable), 2M

QSFP-40G-AOC3M	40G QSFP+ AOC (Active Optical Cable), 3M
QSFP-40G-AOC5M	40G QSFP+ AOC (Active Optical Cable), 5M
QSFP-40G-AOC7M	40G QSFP+ AOC (Active Optical Cable), 7M
QSFP-40G-AOC10M	40G QSFP+ AOC (Active Optical Cable), 10M
QSFP-40G-AOC15M	40G QSFP+ AOC (Active Optical Cable), 15M
QSFP-40G-AOC20M	40G QSFP+ AOC (Active Optical Cable), 20M
QSFP-40G-AOC25M	40G QSFP+ AOC (Active Optical Cable), 25M
QSFP-40G-AOC30M	40G QSFP+ AOC (Active Optical Cable), 30M
QSFP-40G-AOC40M	40G QSFP+ AOC (Active Optical Cable), 40M
QSFP-40G-AOC50M	40G QSFP+ AOC (Active Optical Cable), 50M
QSFP-40G-AOC100M	40G QSFP+ AOC (Active Optical Cable), 100M
QSFP-40G-AOCxxM	Customized 40G QSFP+ AOC (Active Optical Cable), x:1~300, Length in meters

Warnings

Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information, visit us on the web at www.optcore.net