

## Features

- Full duplex 4 channel 850nm parallel active optical cable
- Transmission data rate up to 10.3125Gbit/s per channel
- SFF-8436 QSFP+ compliant
- Hot pluggable electrical interface
- Differential AC-coupled high speed data interface
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Maximum link length of 300m on OM3 Multimode Fiber (MMF) and 400m on OM4 MMF
- Low power consumption <1.5W
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant



## Applications

- Infiniband transmission at 4ch SDR, DDR and QDR
- 40GBASE-SR4 40G Ethernet
- Data Centers

### 1. Absolute Maximum Ratings

\*Exceeding the limits below may damage the active optical cable permanently.

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.3	3.6	V
Input Voltage	Vin	-0.3	Vcc+0.3	V
Storage Temperature	Tst	-20	85	°C
Case Operating Temperature	Top	0	70	°C
Humidity (non-condensing)	Rh	5	95	%

## 2. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Case temperature	Tca	0		70	°C
Data Rate Per Lane	fd	2.5	10.3	11.1	Gbps
Humidity	Rh	5		85	%
Power Dissipation	Pm			1.5	W
Fiber Bend Radius	Rb	3			cm

## 3. QSFP+ AOC Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Differential input impedance	Zin	90	100	110	ohm
Differential Output impedance	Zout	90	100	110	ohm
Differential input voltage amplitude	$\Delta V_{in}$	300		1100	mVp-p
Differential output voltage amplitude	$\Delta V_{out}$	500		800	mVp-p
Skew	Sw			300	ps
Bit Error Rate	BR			E-12	
Input Logic Level High	VIH	2.0		VCC	V
Input Logic Level Low	VIL	0		0.8	V
Output Logic Level High	VOH	VCC-0.5		VCC	V
Output Logic Level Low	VOL	0		0.4	V

### Notes:

1. BER=10<sup>-12</sup>; PRBS 2<sup>31</sup>-1@10.3125Gbps.
2. Differential input voltage amplitude is measured between TxnP and TxnN
3. Differential output voltage amplitude is measured between RxNP and RxnN

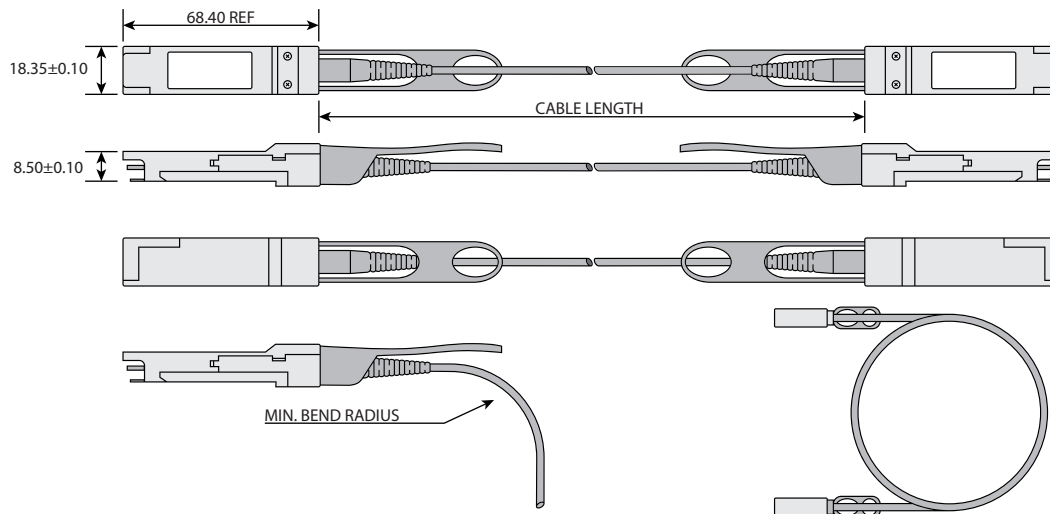
## 4. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_c$	840	850	860	nm	
RMS spectral width	$\Delta\lambda$	-	-	0.65	nm	
Average Launch Power, each Lane	$P_{OUT}$	-7.6	-	2.4	dBm	
Difference in Launch Power between any Two Lanes (OMA)	$P_{tx,diff}$			4	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane	OMA-TDP	-1.5			dBm	
Extinction Ratio	ER	3	-	-	dB	
Peak pwer, each lane				4	dBm	
TDP, each Lane	TDP			3.5	dB	
Average Launch Power OFF Transmitter, each Lane	$P_{off}$			-30	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		SPECIFICATION VALUES 0.23, 0.34, 0.43, 0.27, 0.35, 0.4				Hit Ratio = $5 \times 10^{-5}$
<b>Receiver</b>						
Center Wavelength	$\lambda_c$	840	850	860	nm	
Stressed Receiver Sensitivity (OMA), each Lane				-5.4	dBm	1
Average Power at Receiver Input, each Lane				2.4	dBm	
Receiver Reflectance	RR			-12	dB	
Peak power, each lane				4	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Deassert	LOSD			-7.5	dBm	
LOS Hysteresis	LOSH	0.5			dB	

### Notes:

1. Measured with conformance test signal at TP3 for BER =  $10e-12$

## 5. Mechanical Diagram



**Note:** External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

## 6. Ordering Information

OEM	Part Number	OEM	Part Number
Arista	AOC-Q-Q-40G-1M-A	Juniper	JNP-40G-AOC-25M-A
Arista	AOC-Q-Q-40G-3M-A	Juniper	JNP-40G-AOC-2M-A
Arista	AOC-Q-Q-40G-5M-A	Juniper	JNP-40G-AOC-4M-A
Arista	AOC-Q-Q-40G-10M-A	Juniper	JNP-40G-AOC-7M-A
Arista	AOC-Q-Q-40G-15M-A	Juniper	JNP-40G-AOC-12M-A
Arista	AOC-Q-Q-40G-25M-A	Juniper	JNP-40G-AOC-20M-A
Arista	AOC-Q-Q-40G-2M-A	Juniper	JNP-40G-AOC-30M-A
Arista	AOC-Q-Q-40G-4M-A	Juniper	JNP-40G-AOC-20M-C1
Arista	AOC-Q-Q-40G-7M-A	Juniper	JNP-40G-AOC-30M-C1
Arista	AOC-Q-Q-40G-12M-A	Juniper/Melenox	QSFP40G-JNMX-AOC-30M-C1
Arista	AOC-Q-Q-40G-20M-A	Lenovo	7Z57A04256-A
Arista	AOC-Q-Q-40G-30M-A	Lenovo	00YL652-A
Avago/Broadcom	AFBR-7QER01Z-A	Lenovo	00YL655-A
Avago/Broadcom	AFBR-7QER03Z-A	Lenovo	00YL65810-A
Avago/Broadcom	AFBR-7QER05Z-A	Lenovo	00YL661-A
Avago/Broadcom	AFBR-7QER10Z-A	Lenovo	00YL66425-A
Avago/Broadcom	AFBR-7QER15Z-A	Lenovo	7Z57A042562-A
Avago/Broadcom	AFBR-7QER25Z-A	Lenovo	00YL6524-A

Avago/Broadcom	AFBR-7QER02Z-A	Lenovo	00YL658-A
Avago/Broadcom	AFBR-7QER04Z-A	Lenovo	00YL65812-A
Avago/Broadcom	AFBR-7QER07Z-A	Lenovo	00YL664-A
Avago/Broadcom	AFBR-7QER12Z-A	Lenovo	00YL66430-A
Avago/Broadcom	AFBR-7QER20Z-A	Mellanox	MC2210310-001-A
Avago/Broadcom	AFBR-7QER30Z-A	Mellanox	MC2210310-003-A
Brocade	40G-QSFP-QSFP-AOC-0101-A	Mellanox	MC2210310-005-A
Brocade	40G-QSFP-QSFP-AOC-0301-A	Mellanox	MC2210310-010-A
Brocade	40G-QSFP-QSFP-AOC-0501-A	Mellanox	MC2210310-015-A
Brocade	40G-QSFP-QSFP-AOC-1001-A	Mellanox	MC2210310-025-A
Brocade	40G-QSFP-QSFP-AOC-1501-A	Mellanox	MC2210310-002-A
Brocade	40G-QSFP-QSFP-AOC-2501-A	Mellanox	MC2210310-004-A
Brocade	40G-QSFP-QSFP-AOC-0201-A	Mellanox	MC2210310-007-A
Brocade	40G-QSFP-QSFP-AOC-0401-A	Mellanox	MC2210310-012-A
Brocade	40G-QSFP-QSFP-AOC-0701-A	Mellanox	MC2210310-020-A
Brocade	40G-QSFP-QSFP-AOC-1201-A	Mellanox	MC2210310-030-A
Brocade	40G-QSFP-QSFP-AOC-2001-A	MSA	AN-QSFP-QSFP-AOC-1M
Brocade	40G-QSFP-QSFP-AOC-3001-A	MSA	AN-QSFP-QSFP-AOC-3M
Cisco	QSFP-H40G-AOC1M-A	MSA	AN-QSFP-QSFP-AOC-5M
Cisco	QSFP-H40G-AOC3M-A	MSA	AN-QSFP-QSFP-AOC-10M
Cisco	QSFP-H40G-AOC5M-A	MSA	AN-QSFP-QSFP-AOC-15M
Cisco	QSFP-H40G-AOC10M-A	MSA	AN-QSFP-QSFP-AOC-25M
Cisco	QSFP-H40G-AOC15M-A	MSA	AN-QSFP-QSFP-AOC-2M
Cisco	QSFP-H40G-AOC25M-A	MSA	AN-QSFP-QSFP-AOC-4M
Cisco	QSFP-H40G-AOC2M-A	MSA	AN-QSFP-QSFP-AOC-7M
Cisco	QSFP-H40G-AOC4M-A	MSA	AN-QSFP-QSFP-AOC-12M
Cisco	QSFP-H40G-AOC7M-A	MSA	AN-QSFP-QSFP-AOC-20M
Cisco	QSFP-H40G-AOC12M-A	MSA	AN-QSFP-QSFP-AOC-30M
Cisco	QSFP-H40G-AOC20M-A	MSA Champion ONE	CAB-QSFP-QSFP-AOC-10M-C1
Cisco	QSFP-H40G-AOC30M-A	MSA Champion ONE	CAB-QSFP-QSFP-AOC-15M-C1
Cisco	QSFP-H40G-AOC2M-C1	MSA Champion ONE	CAB-QSFP-QSFP-AOC-20M-C1
Cisco	QSFP-H40G-AOC3M-C1	MSA Champion ONE	CAB-QSFP-QSFP-AOC-3M-C1
Dell	AOC-QSFP-40G-1M-A	MSA Champion ONE	CAB-QSFP-QSFP-AOC-5M-C1
Dell	AOC-QSFP-40G-3M-A	MSA Champion ONE	40G-QSFP-QSFP-AOC-1501-C1
Dell	AOC-QSFP-40G-5M-A	MSA Champion ONE	470-AAZM-20M-C1
Dell	AOC-QSFP-40G-10M-A	MSA Champion ONE	40GQSFP+E-AO020
Dell	AOC-QSFP-40G-15M-A	MSA OnePort	OP-Q40-AOC-20M

Dell	AOC-QSFP-40G-25M-A	NVIDIA	MC2206310-001-A
Dell	AOC-QSFP-40G-2M-A	NVIDIA	MC2206310-003-A
Dell	AOC-QSFP-40G-4M-A	NVIDIA	MC2206310-005-A
Dell	AOC-QSFP-40G-7M-A	NVIDIA	MC2206310-010-A
Dell	AOC-QSFP-40G-12M-A	NVIDIA	MC2206310-015-A
Dell	AOC-QSFP-40G-20M-A	NVIDIA	MC2206310-025-A
Dell	AOC-QSFP-40G-30M-A	NVIDIA	MC2206310-002-A
Extreme	40GB-F01-QSFP-A	NVIDIA	MC2206310-004-A
Extreme	10336-A	NVIDIA	MC2206310-007-A
Extreme	10337-A	NVIDIA	MC2206310-012-A
Extreme	10315-A	NVIDIA	MC2206310-020-A
Extreme	40GB-F15-QSFP-A	NVIDIA	MC2206310-030-A
Extreme	40GB-F25-QSFP-A	Palo Alto	PAN-QSFP-AOC-1M-A
Extreme	40GB-F02-QSFP-A	Palo Alto	PAN-QSFP-AOC-3M-A
Extreme	40GB-F04-QSFP-A	Palo Alto	PAN-QSFP-AOC-5M-A
Extreme	40GB-F07-QSFP-A	Palo Alto	PAN-QSFP-AOC-10M-A
Extreme	40GB-F12-QSFP-A	Palo Alto	PAN-QSFP-AOC-15M-A
Extreme	10316-A	Palo Alto	PAN-QSFP-AOC-25M-A
Extreme	40GB-F30-QSFP-A	Palo Alto	PAN-QSFP-AOC-2M-A
Finisar	FCBG410QD3C01-A	Palo Alto	PAN-QSFP-AOC-4M-A
Finisar	FCBG410QD3C03-A	Palo Alto	PAN-QSFP-AOC-7M-A
Finisar	FCBG410QD3C05-A	Palo Alto	PAN-QSFP-AOC-12M-A
Finisar	FCBG410QD3C10-A	Palo Alto	PAN-QSFP-AOC-20M-A
Finisar	FCBG410QD3C15-A	Palo Alto	PAN-QSFP-AOC-30M-A
Finisar	FCBG410QD3C25-A	Siemon	Q1Q10F-V01.0M13-A
Finisar	FCBN410QD3C01-A	Siemon	Q1Q10F-V03.0M13-A
Finisar	FCBN410QD3C03-A	Siemon	Q1Q10F-V05.0M13-A
Finisar	FCBN410QD3C05 -A	Siemon	Q1Q10F-V10.0M13-A
Finisar	FCBN410QD3C10-A	Siemon	Q1Q10F-V15.0M13-A
Finisar	FCBN410QD3C15-A	Siemon	Q1Q10F-V25.0M13-A
Finisar	FCBN410QD3C25-A	Siemon	Q1Q10F-V02.0M13-A
Finisar	FCBG410QD3C02-A	Siemon	Q1Q10F-V04.0M13-A
Finisar	FCBG410QD3C04-A	Siemon	Q1Q10F-V07.0M13-A
Finisar	FCBG410QD3C07-A	Siemon	Q1Q10F-V12.0M13-A
Finisar	FCBG410QD3C12-A	Siemon	Q1Q10F-V20.0M13-A
Finisar	FCBG410QD3C20-A	Siemon	Q1Q10F-V30.0M13-A
Finisar	FCBG410QD3C30-A	Supermicro	CBL-QSFP+AOC-1M-A

Finisar	FCBN410QD3C02-A	Supermicro	CBL-QSFP+AOC-3M-A
Finisar	FCBN410QD3C04 -A	Supermicro	CBL-QSFP+AOC-5M-A
Finisar	FCBN410QD3C07 -A	Supermicro	CBL-QSFP+AOC-10M-A
Finisar	FCBN410QD3C12-A	Supermicro	CBL-QSFP+AOC-15M-A
Finisar	FCBN410QD3C20-A	Supermicro	CBL-QSFP+AOC-25M-A
Finisar	FCBN410QD3C30 -A	Supermicro	CBL-QSFP+AOC-2M-A
Juniper	JNP-40G-AOC-1M-A	Supermicro	CBL-QSFP+AOC-4M-A
Juniper	JNP-40G-AOC-3M-A	Supermicro	CBL-QSFP+AOC-7M-A
Juniper	JNP-40G-AOC-5M-A	Supermicro	CBL-QSFP+AOC-12M-A
Juniper	JNP-40G-AOC-10M-A	Supermicro	CBL-QSFP+AOC-20M-A
Juniper	JNP-40G-AOC-15M-A	Supermicro	CBL-QSFP+AOC-30M-A

## 7. Contact Information

Tel: 800.590.9535

Web: <http://www.approvednetworks.com>