

### Features

- Electrical interface compliant to QSFP+ connector
- (SFF-8436) and SFP+ connectors (SFF-8431)
- Hot Pluggable
- 850nm VCSEL transmitter, PIN photo-detector receiver
- Up to 100m on OM3 MMF
- Operating case temperature: 0 to 70 °C
- All-metal housing for superior EMI performance
- RoHS compliant (lead free)



- Fibre Channel Applications
- InfiniBand QDR, SDR, DDR
- High-performance computing clusters
- Servers, switches, storage and host card adapters

### Applications

- 40 Gigabit Ethernet

### 1. QSFP Interface Specifications

Parameter	Description
Module Form Factor	QSFP+ (Supports SFF8436/SFF8472)
Channel Data Rate	Rate 40Gbps
BER	<10 <sup>-12</sup>
Operating Case Temperature	0 to + 70°C
Storage Temperature	-20 to + 85°C
Supply Voltage	3.3V
Supply current	180mA per end typical
Management Interface	Serial I2C (Supports SFF8472)

## 2. Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min	Typ	Max	Unit	Notes
<b>Transmitter</b>						
Centre Wavelength	$\lambda_c$	840	850	860	nm	-
RMS spectral width	$\Delta\lambda$	-	-	0.65	nm	-
Average launch power, each lane	P <sub>out</sub>	-7.5	-	2.5	dBm	-
Difference in launch power between any two lanes (OMA)				4	dB	-
Extinction Ratio	ER	3	-	-	dB	-
Peak power, each lane				4	dBm	-
Transmitter and dispersion penalty (TDP), each lane	TDP			3.5	dB	-
Average launch power of OFF transmitter, each lane				-30	dB	-
Eye Mask coordinates: X1, X2, X3, Y1, Y2, Y3	SPECIFICATION VALUES 0.23, 0.34, 0.43, 0.27, 0.35, 0.4				Hit Ratio = 5x10 <sup>-5</sup>	
<b>Receiver</b>						
Centre Wavelength	$\lambda_c$	840	850	860	nm	-
Stressed receiver sensitivity in OMA, each lane				-5.4	dBm	1
Maximum Average power at receiver input, each lane				2.4	dBm	-
Receiver Reflectance				-12	dB	-
Peak power, each lane				4	dBm	-
LOS Assert		-30			dBm	-
LOS De-Assert – OMA				-7.5	dBm	-
LOS Hysteresis		0.5			dB	-

### Notes:

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

### 3. SFP+ Interface Specifications

Parameter	Description
Module Form Factor	SFP+ (Supports SFF8431/SFF8432/SFF8472)
Channel Data Rate	Rate 1 to 10.3125Gbps
BER	<10 <sup>-12</sup>
Operating Case Temperature	0 to + 70°C
Storage Temperature	-20 to + 85°C
Supply Voltage	3.3V
Supply current	455mA maximum
Management Interface Serial	I <sup>2</sup> C (Supports SFF8472)

### 4. Optical Characteristics

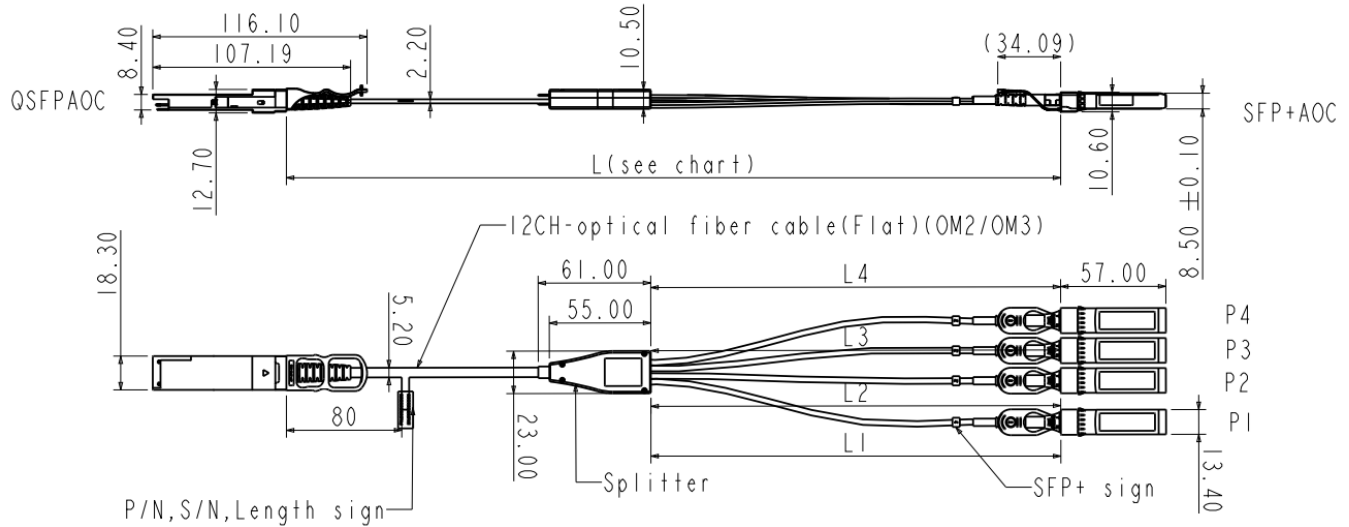
The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_t$	840	850	860	nm	
RMS spectral width	$P_m$	-	-	nm		
Average Optical Power	$P_{avg}$	-6.5	-	-1	dBm	2
Extinction Ratio	ER	3.5	-	-	dB	3
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	$R_{in}$	-	-	-128	dB/Hz	1
Optical Return Loss Tolerance		-	-	12	dB	
<b>Receiver</b>						
Center Wavelength	$\lambda_r$	840	850	860	nm	
Receiver Sensitivity $P_{sens}$	-	-	-11.1	dBm	4	
Stressed Sensitivity in OMA	-	-	-7.5	dBm	4	
Los function	$Los$	-30	-	12	dBm	
Overload	$P_{in}$	-	-	-1.0	dBm	4
Receiver Reflectance	-	-	-12	dB		

**Notes:**

- 12dB reflection
- The optical power is launched into MMF
- Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps
- Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps, BER ≤ 10<sup>-12</sup>.

## 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-40G-Q-S-1M-A	Extreme	10GB-4-F05-QSFP-A
Arista	AOC-40G-Q-S-3M-A	Extreme	10GB-4-F10-QSFP-A
Arista	AOC-40G-Q-S-5M-A	Extreme	10GB-4-F15-QSFP-A
Arista	AOC-40G-Q-S-10M-A	Extreme	10GB-4-F25-QSFP-A
Arista	AOC-40G-Q-S-15M-A	Extreme	10GB-4-F02-QSFP-A
Arista	AOC-40G-Q-S-25M-A	Extreme	10GB-4-F04-QSFP-A
Arista	AOC-40G-Q-S-2M-A	Extreme	10GB-4-F07-QSFP-A
Arista	AOC-40G-Q-S-4M-A	Extreme	10GB-4-F12-QSFP-A
Arista	AOC-40G-Q-S-7M-A	Extreme	10GB-4-F20-QSFP-A
Arista	AOC-40G-Q-S-12M-A	Extreme	10GB-4-F30-QSFP-A
Arista	AOC-40G-Q-S-20M-A	Finisar	FCBN510QE2C01-A
Arista	AOC-40G-Q-S-30M-A	Finisar	FCBN510QE2C03-A
Avago/Broadcom	AFBR-71ER01Z-A	Finisar	FCBN510QE2C05-A
Avago/Broadcom	AFBR-71ER03Z-A	Finisar	FCBN510QE2C10-A
Avago/Broadcom	AFBR-71ER05Z-A	Finisar	FCBN510QE2C15-A
Avago/Broadcom	AFBR-71ER10Z-A	Finisar	FCBN510QE2C25-A

Avago/Broadcom	AFBR-7IER15Z-A	Finisar	FCBN510QE2C02-A
Avago/Broadcom	AFBR-7IER25Z-A	Finisar	FCBN510QE2C04-A
Avago/Broadcom	AFBR-7IER02Z-A	Finisar	FCBN510QE2C07-A
Avago/Broadcom	AFBR-7IER04Z-A	Finisar	FCBN510QE2C12-A
Avago/Broadcom	AFBR-7IER07Z-A	Finisar	FCBN510QE2C20-A
Avago/Broadcom	AFBR-7IER12Z-A	Finisar	FCBN510QE2C30-A
Avago/Broadcom	AFBR-7IER20Z-A	Intel	X4AOCBL-2M-C1
Avago/Broadcom	AFBR-7IER30Z-A	Intel	X4AOCBL-3M-C1
Brocade	40G-QSFP-4SFP-AOC-0101-A	Intel	X4AOCBL-5M-C1
Brocade	40G-QSFP-4SFP-AOC-0301-A	Intel	X4AOCBL-8M-C1
Brocade	40G-QSFP-4SFP-AOC-0501-A	Intel	X4AOCBL-10M-C1
Brocade	40G-QSFP-4SFP-AOC-1001-A	Juniper	JNP-QSFP-AOCBO-1M-A
Brocade	40G-QSFP-4SFP-AOC-1501-A	Juniper	JNP-QSFP-AOCBO-3M-A
Brocade	40G-QSFP-4SFP-AOC-2501-A	Juniper	JNP-QSFP-AOCBO-5M-A
Brocade	40G-QSFP-4SFP-AOC-0201-A	Juniper	JNP-QSFP-AOCBO-10M-A
Brocade	40G-QSFP-4SFP-AOC-0401-A	Juniper	JNP-QSFP-AOCBO-15M-A
Brocade	40G-QSFP-4SFP-AOC-0701-A	Juniper	JNP-QSFP-AOCBO-25M-A
Brocade	40G-QSFP-4SFP-AOC-1201-A	Juniper	JNP-QSFP-AOCBO-2M-A
Brocade	40G-QSFP-4SFP-AOC-2001-A	Juniper	JNP-QSFP-AOCBO-4M-A
Brocade	40G-QSFP-4SFP-AOC-3001-A	Juniper	JNP-QSFP-AOCBO-7M-A
Brocade	40G-QSFP-4SFP-AOC-1001-C1	Juniper	JNP-QSFP-AOCBO-12M-A
Cisco	QSFP-4X10G-AOC1M-A	Juniper	JNP-QSFP-AOCBO-20M-A
Cisco	QSFP-4X10G-AOC3M-A	Juniper	JNP-QSFP-AOCBO-30M-A
Cisco	QSFP-4X10G-AOC5M-A	MSA	CAB-QSFP-4XSFP-AOC-1M-A
Cisco	QSFP-4X10G-AOC10M-A	MSA	CAB-QSFP-4XSFP-AOC-3M-A
Cisco	QSFP-4X10G-AOC15M-A	MSA	CAB-QSFP-4XSFP-AOC-5M-A
Cisco	QSFP-4X10G-AOC25M-A	MSA	CAB-QSFP-4XSFP-AOC-10M-A
Cisco	QSFP-4X10G-AOC2M-A	MSA	CAB-QSFP-4XSFP-AOC-15M-A
Cisco	QSFP-4X10G-AOC4M-A	MSA	CAB-QSFP-4XSFP-AOC-25M-A
Cisco	QSFP-4X10G-AOC7M-A	MSA	CAB-QSFP-4XSFP-AOC-2M-A
Cisco	QSFP-4X10G-AOC12M-A	MSA	CAB-QSFP-4XSFP-AOC-4M-A
Cisco	QSFP-4X10G-AOC20M-A	MSA	CAB-QSFP-4XSFP-AOC-7M-A
Cisco	QSFP-4X10G-AOC30M-A	MSA	CAB-QSFP-4XSFP-AOC-12M-A
Cisco/HP	Q40X10G-CSHP-AOC-10M-C1	MSA	CAB-QSFP-4XSFP-AOC-20M-A
Dell	AOC-QSFP-4SFP-10G-1M-A	MSA	CAB-QSFP-4XSFP-AOC-30M-A
Dell	AOC-QSFP-4SFP-10G-3M-A	MSA Champion ONE	QSFP-4X10G-AOC2M-C1
Dell	AOC-QSFP-4SFP-10G-5M-A	Siemon	Q4S10F-V01.0M13-A

Dell	AOC-QSFP-4SFP-10G-10M-A	Siemon	Q4S10F-V03.0M13-A
Dell	AOC-QSFP-4SFP-10G-15M-A	Siemon	Q4S10F-V05.0M13-A
Dell	AOC-QSFP-4SFP-10G-25M-A	Siemon	Q4S10F-V10.0M13-A
Dell	AOC-QSFP-4SFP-10G-2M-A	Siemon	Q4S10F-V15.0M13-A
Dell	AOC-QSFP-4SFP-10G-4M-A	Siemon	Q4S10F-V25.0M13-A
Dell	AOC-QSFP-4SFP-10G-7M-A	Siemon	Q4S10F-V02.0M13-A
Dell	AOC-QSFP-4SFP-10G-12M-A	Siemon	Q4S10F-V04.0M13-A
Dell	AOC-QSFP-4SFP-10G-20M-A	Siemon	Q4S10F-V07.0M13-A
Dell	AOC-QSFP-4SFP-10G-30M-A	Siemon	Q4S10F-V12.0M13-A
Extreme	10GB-4-F01-QSFP-A	Siemon	Q4S10F-V20.0M13-A
Extreme	10GB-4-F03-QSFP-A	Siemon	Q4S10F-V30.0M13-A

## 7. Contact Information

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