

## 40GBASE-SR4 QSFP+ Active Optical Cables

### AOC-Q1Q1-xxx

#### Features

- Support 40GBASE-SR4/QDR application
- Compliant to QSFP+ Electrical MSA SFF-8436
- Multi rate of up to 10.3125Gbps
- +3.3V single power supply
- Low power consumption
- Operating case temp Commercial: 0°C to +70°C
- UL certification cables (optional)
- RoHS compliant



#### Applications

- 40GBASE-SR4 at 10.3125Gbps per lane
- InfiniBand QDR
- Other optical links

#### Absolute Maximum Ratings

Table1- Absolute Maximum Ratings

Form Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc3	-0.5		+3.6	V	
Storage Temperature	Ts	-10		+70	°C	
Operating Humidity	TOP	+5		+85	%	1

Note: 1 No condensation

## Recommended Operating Conditions

**Table 2- Recommended operating Conditions**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Tc	0	-	+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Dissipation	Pd	-	-	2.5	W	
Bit Rate	BR	10.3125	25.78125	-	Gbps	

Note: 1 Per terminal

## Electrical Characteristics

**Table 3- Electrical Characteristics**

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
ModSelL	Module Select	VOL	0	-	0.8	V	
	Module Unselect	VOH	2.5	-	Vcc	V	
Low Power	Mode LPMode	VIL	0	-	0.8	V	
	Normal Operation	VIH	2.5	-	Vcc+0.3	V	
ResetL	Reset	VIL	0	-	0.8	V	
	Normal Operation	VIH	2.5	-	Vcc+0.3	V	
ModPrsL	Normal Operation	VOL	0	-	0.4	V	
IntL	Interrupt	VOL	0	-	0.4	V	
	Normal Operation	VOH	2.4	-	Vcc	V	
<b>Electrical transmitter Characteristics</b>							
Differential Data Input Swing		Vout	200	-	1600	mV	
Input Differential Impedance		ZD	90	100	110	Ω	
<b>Electrical Receiver Characteristics</b>							
Differential Date Output Swing		Vin,p-p	350	-	800	mVpp	
Output Differential Impedance		BER			E-12		1
Input Differential Impedance		ZIN	90	100	110	Ω	

 Note: 1 PRBS2<sup>A31</sup>-1@10.3125Gbps

## Recommended Interface Circuit

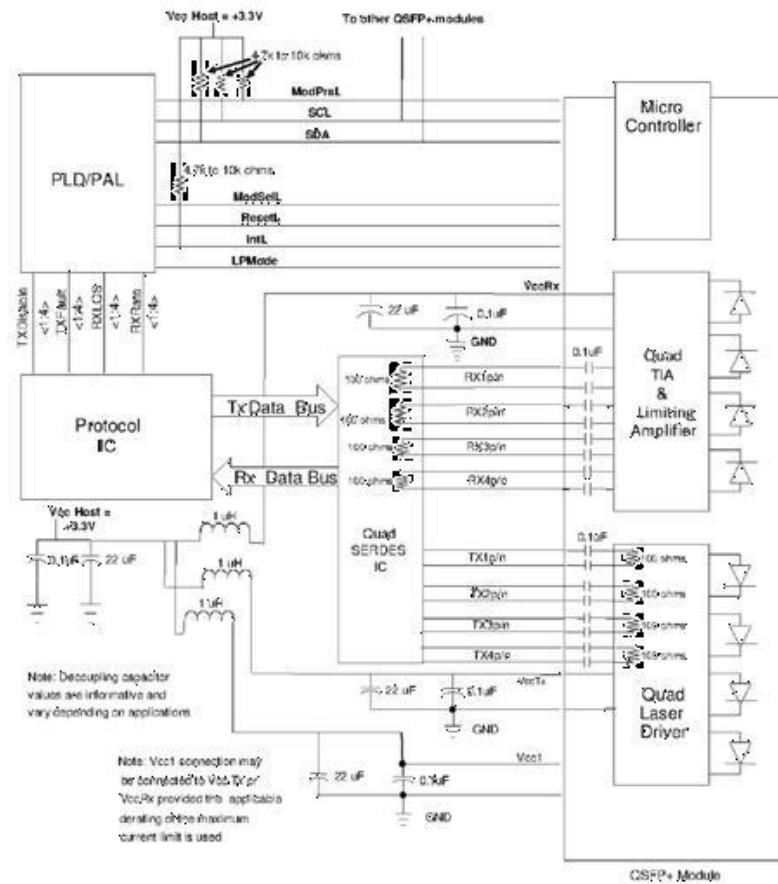


Figure 1, Recommended Interface Circuit

## Pin Descriptions

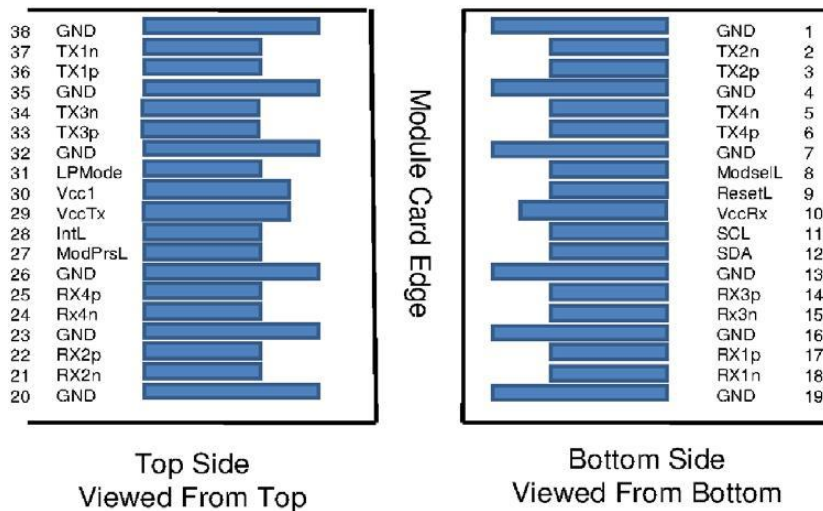


Figure 2, Pin View

**Table 4-Pin Function Definitions**

Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	

38	GND	Ground	1
----	-----	--------	---

Note: 1. Circuit ground is internally isolated from chassis ground.

## Mechanical Design Diagram

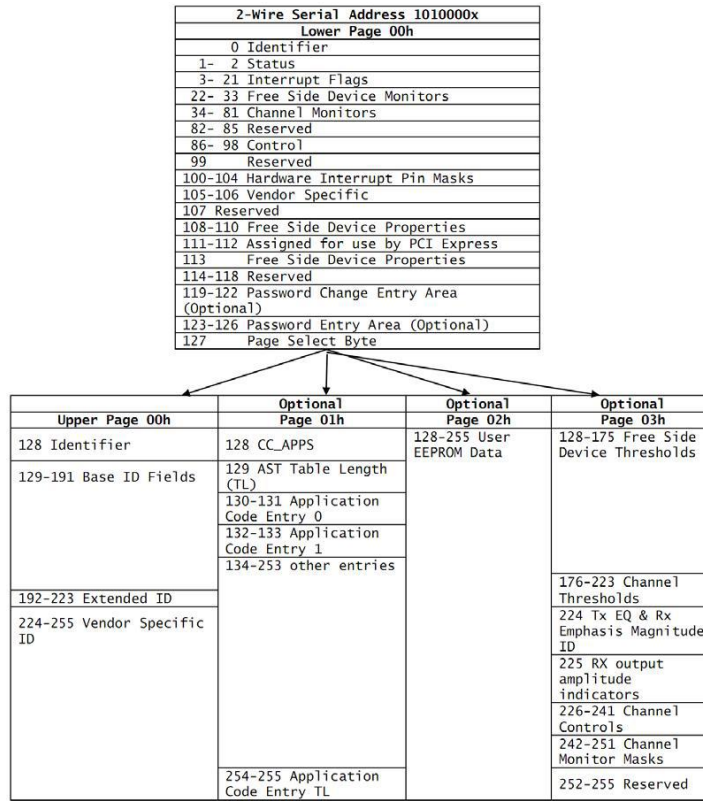
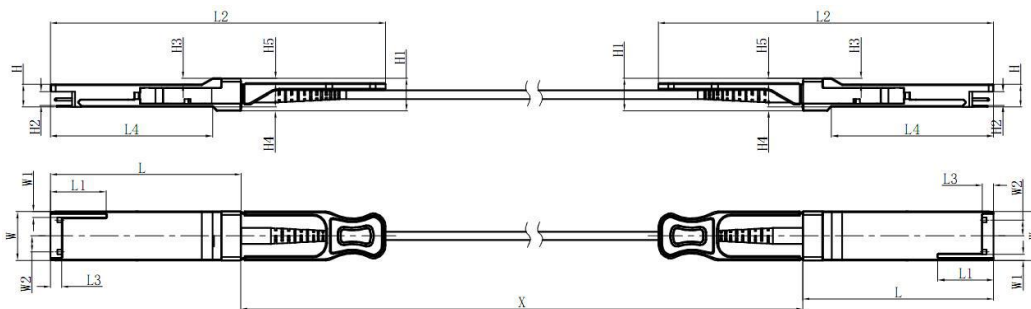


Figure 3, Memory Map

## Mechanical



Unit mm

	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
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	6.55
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	-

Figure 4, Mechanical Diagram

**Table 5- Cable Length**

Cable Length (Unit: m)	Tolerant (Unit: cm)
< 1.0	+5/-0
1.0~4.5	+15/-0
5.0~14.5	+30/-0
≥15.0	+2%/-0

## Warnings

**Handling Precautions** : This device 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**: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

## Ordering Information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance	Fiber Type	Connector	Temp
AOC-Q4Q4-xxx	41.25	850	0.5~150m	MMF	N/A	0°C~+70°C

Note: 1 Case Temperature

## Revision History

Revision	Initiated	Approved	Content	Revision History	Release Date
Ver1.0	QR.huang	Nicky.Wen	Released	The latest version	May/2017
Ver1.1	HT.huang	Nicky.Wen	Released	Update format	Oct/2017
Ver1.2	HT.huang	Nicky.Wen	Released	Version update encryption	Jan/2019

## Further Information