

## **40G QSFP+ Active Optical Cable**

### **Features**

- Compliant to the industry standard SFF-8636 QSFP+ Transceiver Specification
- Full duplex 4 channel 850nm parallel AOC
- High reliability 850nm VCSEL array transmitter
- Hot pluggable
- Single 3.3V power supply, Low power consumption
- 0 to 70°C case temperature operating range
- RoHS-6 compliant (lead-free)
- Metal enclosure for low EMI
- Distance 1m/2m/3m/5m/7m/10m/15m/20m/30m/50m/100m/150m

### **Applications**

- 10GBASE-SR & 40GBASE-SR4 40G Ethernet
- Datacom/Telecom Switch & Router connections
- High speed multi-channel parallel data connections
- High performance computing, server and data storage

### **Compliance**

- Compliant with SFF-8436 Rev 2.7
- Compliant with IEEE 802.3ae

## Description:

QSFP-40G-AOC active optical cable is a Parallel 40Gb/s Quad Small Form-factor, Hot-Pluggable 850nm parallel AOC.

The module integrates 4 independent transmitters and 4 independent receivers in side. Four-channel 850nm VCSEL array, PIN array, amplifier and Driver are used in the module for compact size, low power consumption and low cost.

The AOC is compliant to the industry standard SFF-8436 QSFP+ Transceiver Specification. The electrical interface uses a 38 contact edge type connector. The optical interface uses an 8 or 12 fiber MTP(MPO) connector.

QSFP-40G-AOC active optical cable features small size, parallel multi-channel, hot-pluggable, low power and high speed operation. It's very suitable for high speed short-distance density data connections such as 40G BASE-SR4, Switch & Route interconnects etc.

## Absolute Maximum Ratings

**Table1-Absolute Maximum Ratings**

Parameter	Symbols	Min	Typical	Max	Unit	Notes
Storage Temperature	TSTG	-40	-	+85	°C	
Operating Temperature	Top	0		70	°C	
3.3V Supply Voltage	VCC	-0.5	-	+3.6	V	

## Recommended Operating Conditions

**Table2-Recommended Operating Conditions**

Parameter	Symbols	Min	Typical	Max	Unit	Notes
Case temperature	Tc	0	-	+70	°C	
3.3V Supply Voltage	VCC	3.135	3.3	3.465	V	
Total Data Rate			41.25		Gbps	
Data Rate per Lane			10.3125		Gbps	
Receiver Differential Data Output Load			100		Ohms	
Logic Input Voltage High	Vih	2		Vcc+0.3	V	
Logic Input Voltage Low	Vil	-0.3		0.8	V	
Two wire Serial Interface Clock Rate			100	400	KHz	
Power Supply Noise				50	mVpp	
Standard Cable Lengths		1 ,2 ,3 ,5 ,7, 10, 15, 20, 30, 50, 100(OM3)			m	

## Electrical Characteristic

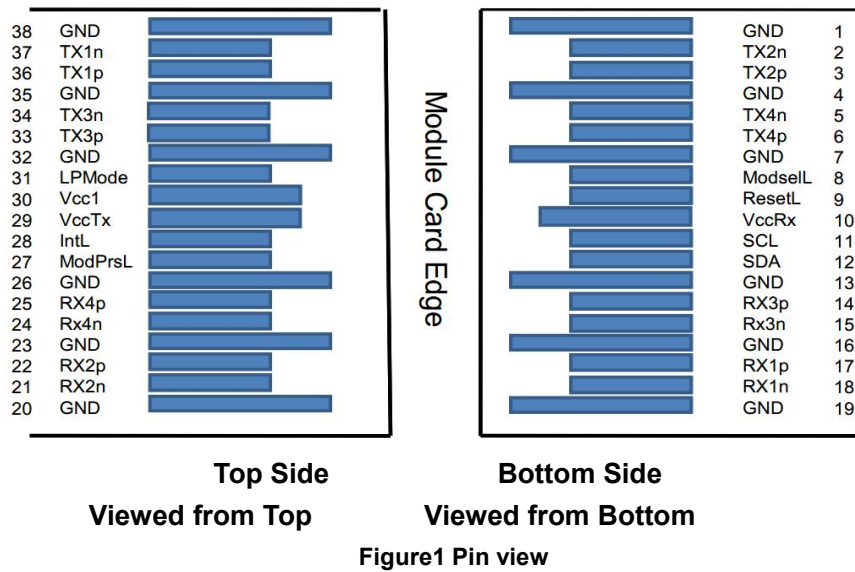
Tested under recommended operating conditions, unless otherwise noted

**Table3- Electrical Characteristic**

Parameter	Symbols	Min	Typical	Max	Unit	Notes
Transceiver Power Consumption				1.5	W	Per Cable End
Transceiver Power Supply Current				450	mA	Per Cable

						End
Transceiver Power On Initialization Time	Tinit			2000	ms	
<b>Transmitterelectrical specifications (per Lane)</b>						
Differential Data Input Voltage Peak to Peak Swing	Vin,pp			900	mV	
Differential Input Impedance	Zind	90	100	110	ohm	AC Coupled Inside Module
J2 Jitter Tolerance	Jt2			0.3	UI	
J9 Jitter Tolerance	Jt9			0.47	UI	
<b>Receiverelectrical specifications (per Lane)</b>						
Differential Data Output Voltage Peak to Peak Swing	Vopp	300		900	mV	
Differential output Impedance	Zos	90	100	110	Ohms	
J2 Output	Jo2			0.42	UI	
J9 Output	Jo9			0.65	UI	
Eye mask coordinates: (X1, X2, Y1, Y2)			0.29, 0.5 150, 425		UI mV	10,Hit ratio = $1 \times 10^{-12}$
Data output rise/fa (20%~80%)		28			ps	20% to 80%

## Pin Assignment



**Table4-Pin Function Definitions**

Pin	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	
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	2
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
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	1
19	GND	Ground	1
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	

23	GND	Ground	
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	VccTx	+3.3V Power supply transmitter	2
30	Vcc1	+3.3V Power supply	2
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

## Notes:

[1] GND is the symbol for signal and supply (power) common for the QSFP module. All are common within the QSFP 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] Vcc Rx, Vcc1 and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 7. Vcc Rx Vcc1 and VccTx may be internally connected within the QSFP Module in any combination. The connector pins are each rated for a maximum current of 500 mA.

## Monitoring Specification

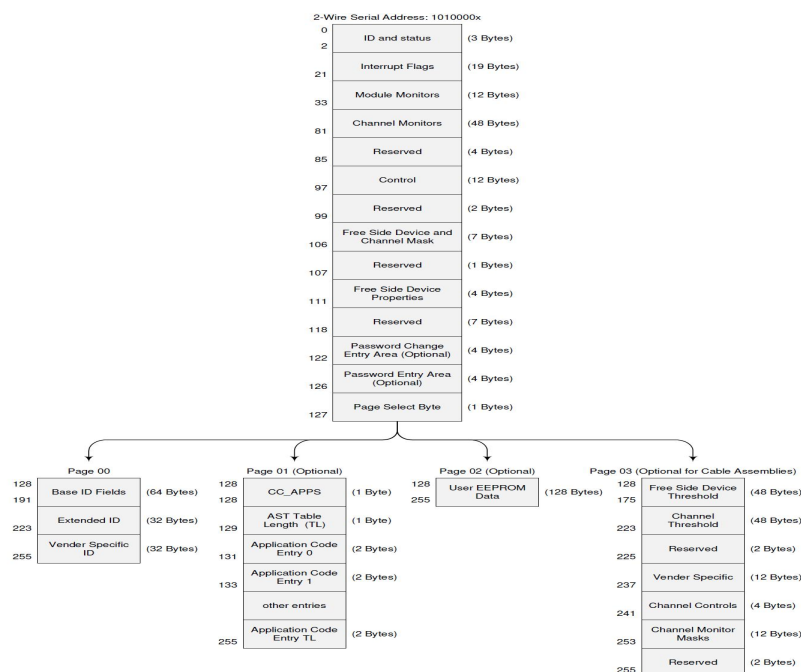


Figure2: Memory map

## Caution

All adjustments have been done at the factory before the shipment of the devices. No maintenance and user serviceable part is required. Tampering with and modifying the performance of the device will result in voided product warranty.

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## Contact Information

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