

40Gb/s 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	Symbol	Min.	Typical	Max.	Unit	Note
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	Symbol	Min.	Typical	Max.	Unit	Note
Case temperature	T _c	0	-	+70	°C	
3.3V Supply Voltage	V _{cc}	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	V _{ih}	2		V _{cc} +0.3	V	
Logic Input Voltage Low	V _{il}	-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	

Characteristics

Table3-Electrical Characteristics						
Parameter	Symbol	Unit	Min.	Typical	Max.	Note
Transmitter						
Transceiver Power Consumption		W			1.5	Per Cable End
Transceiver Power Supply Current		mV			450	Per Cable End
Transceiver Power On Initialization Time	Tinit	ms	-	-	2000	
Transmitter electrical specifications (per Lane)						
Differential Data Input Voltage Peak to Peak Swing	V _{in,pp}	mV			900	
Differential Input Impedance	Z _{ind}	ohm	90	100	110	AC Coupled Inside Module
J2 Jitter Tolerance	Jt2	UI			0.3	
J9 Jitter Tolerance	Jt9	UI			0.47	
Receiver electrical specifications (per Lane)						
Differential Data Output Voltage Peak to Peak Swing	V _{opp}	mV	300		900	
Differential output Impedance	Z _{os}	Ohms	90	100	110	
J2 Output	Jo2	UI			0.42	
J9 Output	Jo9	UI			0.65	
Eye mask coordinates: (X1, X2, Y1, Y2)		UI mV		0.29, 0.5 150, 425		10,Hit ratio = 1 × 10 ⁻¹²
Data output rise/fa (20%~80%)		ps	28			20% to 80%

Monitoring Specification

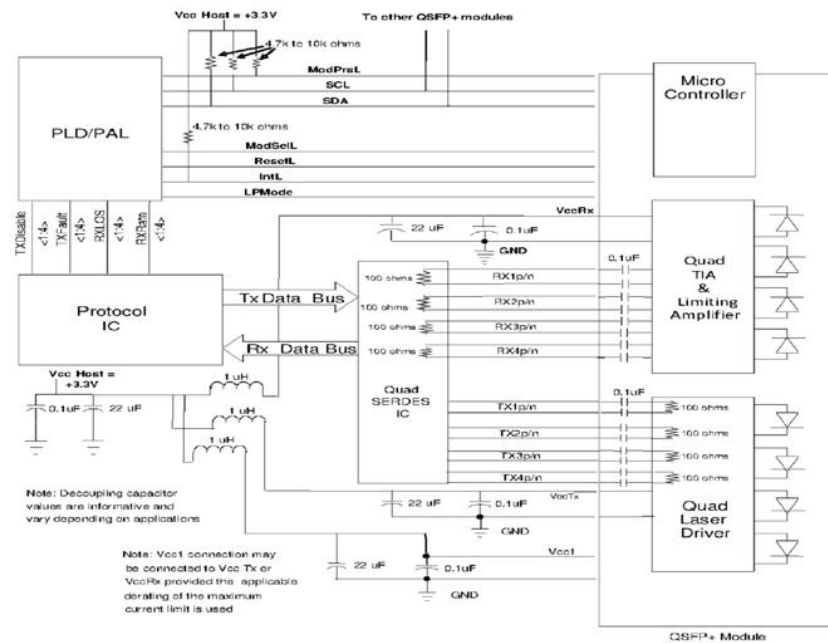


Figure 1 Recommended Interface Circuit

Pin Assignment

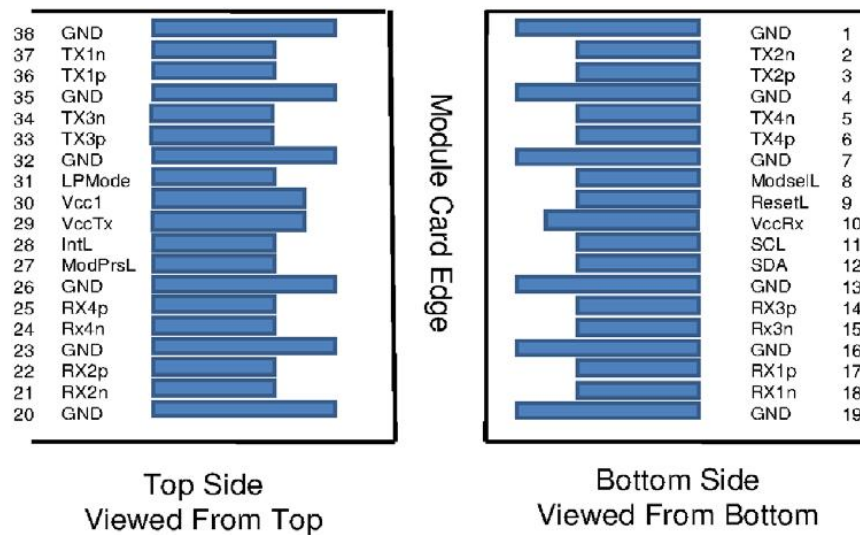


Figure 2 Pin View

Pin Descriptions

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	
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	Vcc Tx	+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

Monitoring Specification

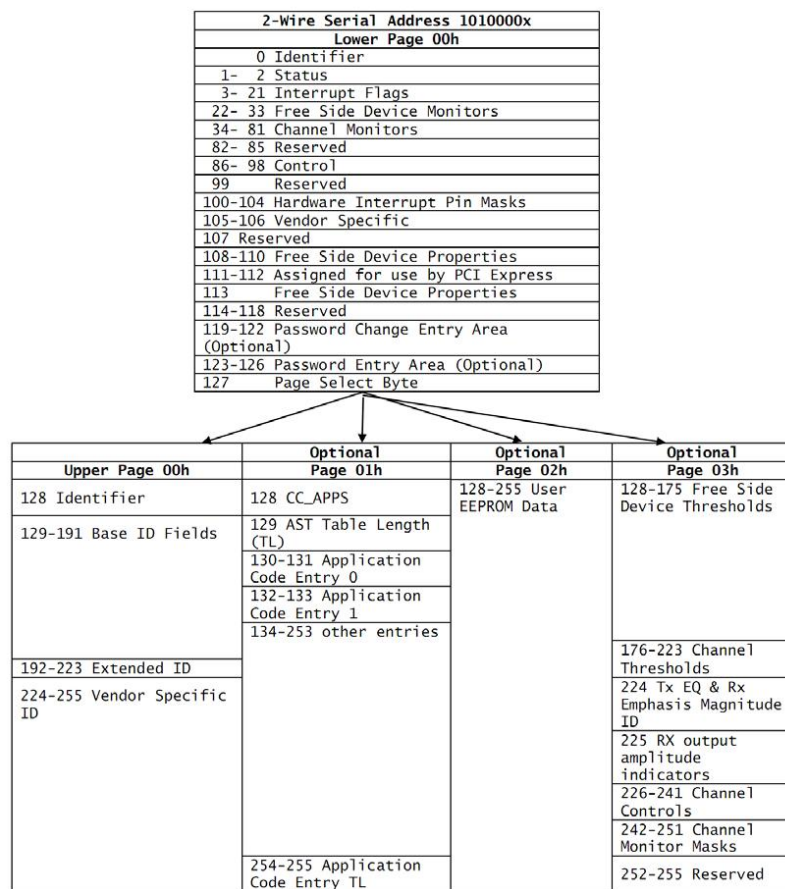
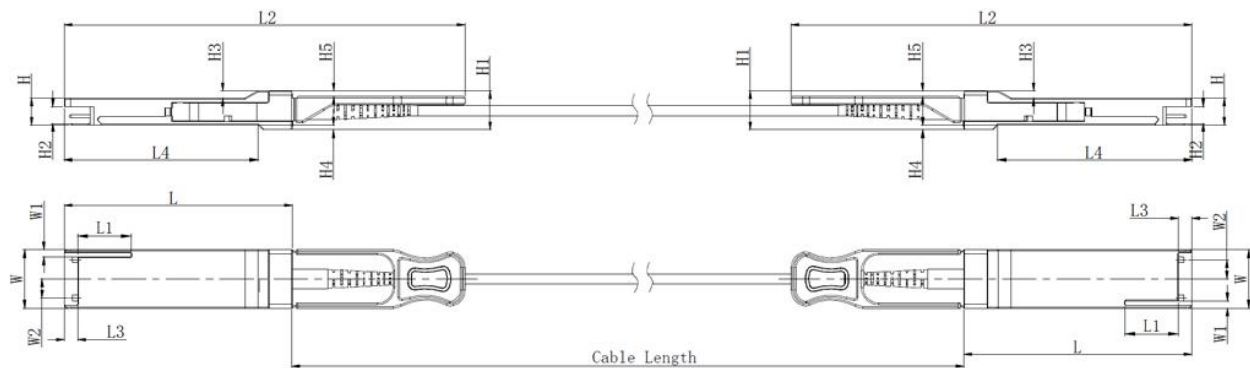


Figure 3 Monitoring Specification

Mechanica



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

Regulatory Compliance

Parameter	Value	Units
Diameter	3	mm
Minimum bend radius	30	mm
Length tolerance	Length $\leq$ 1 m:	+5 / -0
	1 m $\leq$ length $\leq$ 4.5 m:	+15 / -0
	5 m $\leq$ length $\leq$ 14.5 m:	+30 / -0
	Length $\geq$ 15.0 m	+2% / -0
Cable color	Orange(OM2),Aqua(OM3),Magenta(OM4)	

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.

Further Information:

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