

QSFP+ to 4LC Full Duplex Active Optical Cable

AOC-Q1C2-xxx

Features

- 4 channels 850nm VCSEL and PIN
- Electrical interface compliant to SFF-8436
- Support 40GE data rate
- Hot Pluggable QSFP form factor
- Four double LC connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- UL certification cables (optional)



Absolute Maximum Ratings

Parameter	Symbol	Min	Type	Max	Unit
Storage Temperature	T _{STG}	-20		85	°C
Case Operating Temperature	T _{Case}	0		70	°C
Supply Voltage	V _{CC}	-0.5	3.3	3.6	V
Input Voltage	V _{ilvttl}	-0.5		V _{CC} +0.5	V
Damage Threshold	DT	3			dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Type	Max	Unit
Case Operating Temperature	T _{Case}	0		70	°C
Supply Voltage	V _{CC}	3.15	3.3	3.45	V
Differential data input voltage per lane	V _{din}	200		1200	mV
Signaling rate per lane	D _r	2.5	10.3125		Gbit/s
Differential Termination Resistance	Z _{in}	80	100	120	Ω
Module power	P			1.5	W

Transmitter Characteristics

Parameter	Symbol	Min	Type	Max	Unit
Center wavelength	λ_c	840	850	860	nm
RMS Spectral Width	Pm			0.6	nm
Average Launch Power per Lane	PAVG	-8.2	-1	+2.4	dBm
Optical Extinction Ratio	ER	3	4		dB
Total Jitter	TJT _x			120	ps
Transition time (20% to 80%)	τ_R, τ_F			100	ps
Differential data input voltage per lane	VIN _{pp}	120		1600	mV

Note: Tested with a PRBS31 test pattern, T_{OP} = 0 to 70°C, VCC = 3.15 to 3.45 V

Receiver Characteristics

Parameter	Symbol	Min	Type	Max	Unit
Center wavelength	λ_c	840	850	860	nm
Sensitivity	P _{sen}		-12	-10	dBm
Bit Error Ratio	BER			10-12	
Optical Return Loss Tolerance	RL			-12	dB
Differential data output voltage per lane	VOUT _{pp}	320	450		mV
Differential Termination Resistance	Z _{out}	80	100	120	Ω
Transition time (20% to 80%)	t _R , t _F			100	ps
LOS De-Assert	LOSD			-15	dBm
LOS Assert	LOSA	-30			dBm
LOS Hysteresis		0.5	2		dB

Note: Tested with a PRBS31 test pattern, T_{OP} = 0 to 70°C, VCC = 3.15 to 3.45 V

Module Block Diagram

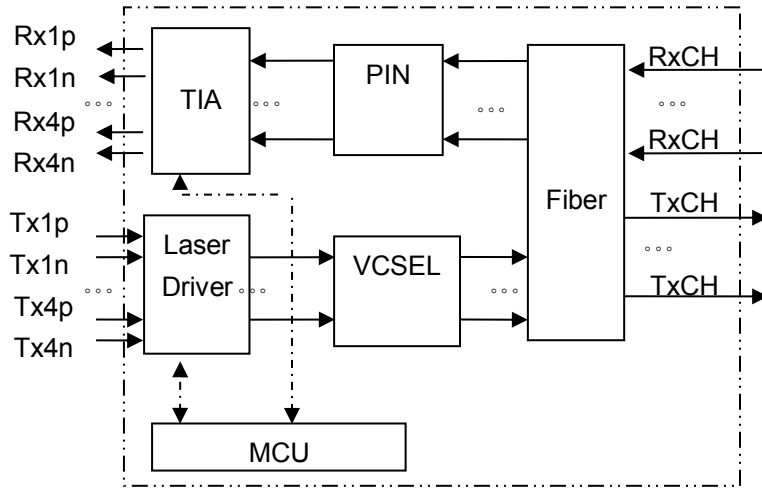
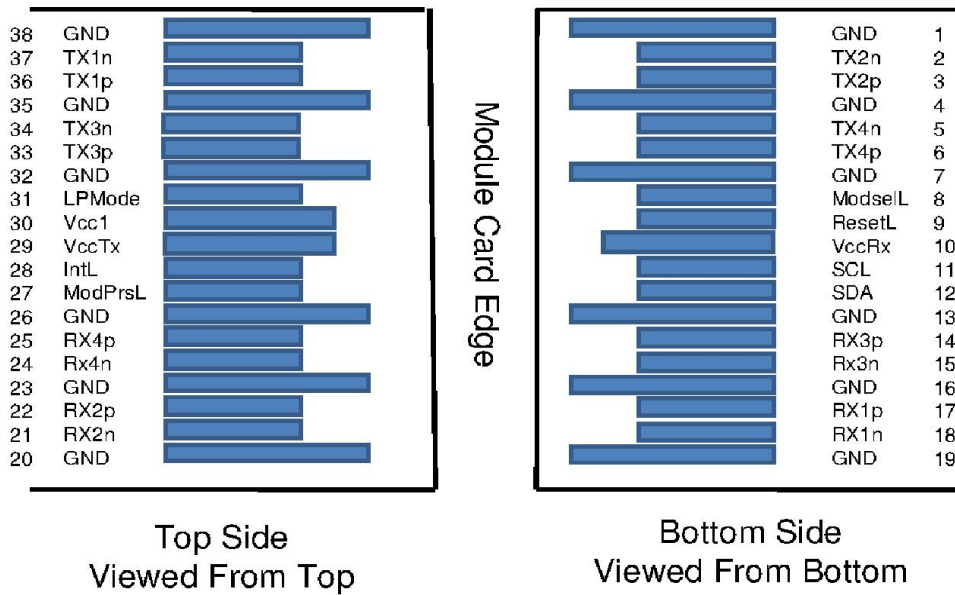


Figure1. Module Block Diagram

Pin Descriptions



Top Side Viewed From Top

Bottom Side Viewed From Bottom

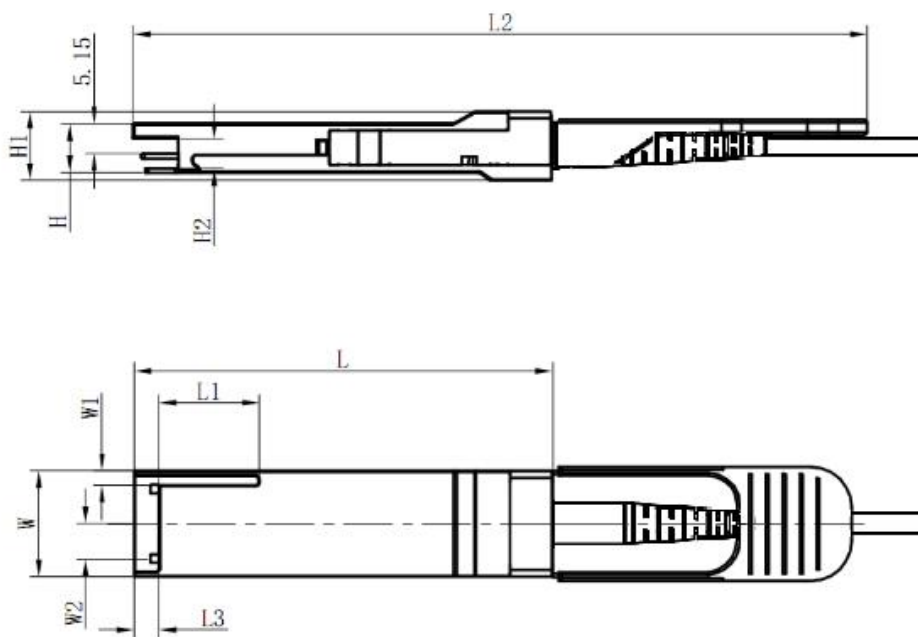
Pin Definition

Parameter	Symbol	Name/Description
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
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
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
19	GND	Ground
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
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

Continued Table

Parameter	Symbol	Name/Description
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

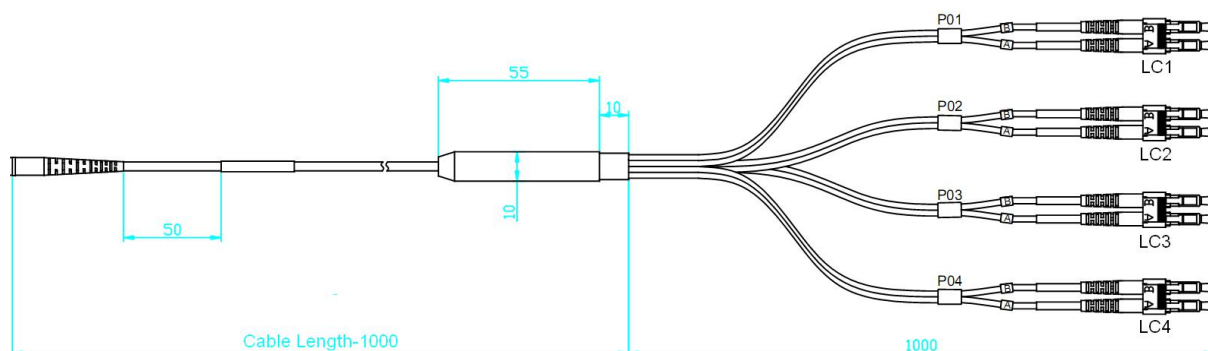
QSFP Side Mechanical Design Diagram



Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
Max	72.2	-	122	4.35	18.5	-	6.2	8.6	12.1	5.35
Type	-	-	-	-	-	-	-	-	-	-
Min	68.8	16.5	118	4.05	18.1	2.2	5.8	8.4	11.7	5.05

Cable Side Mechanical Design Diagram



Optical Interface

Channel	Optical Interface
TX1	LC1 side A
TX2	LC2 side A
TX3	LC3 side A
TX4	LC4 side A
RX4	LC4 side B
RX3	LC3 side B
RX2	LC2 side B
RX1	LC1 side B

Order Information

PN	Cable Information
AOC-Q1C2-xxx	OM3 MMF with UL Certification

XXX	Cable (MMF) Length
001	001=1m
050	050=50m
100	100=100m

Revision History

Revision	Initiated	Approved	content	Release Date
Ver1.0	QR.HUANG	Nicky	Released	June/2017

Further Information

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