40G QSFP+ AOC

Description

The Wave2Wave 78-Q010-xxM series is a high-performance 40G QSFP+ Active Optical Cable engineered for next-generation data center, cloud, and high-bandwidth computing environments.



This full-duplex optical assembly delivers four independent transmit and receive channels, each supporting up to 10Gbps, enabling an aggregate bandwidth of 40Gbps.

Designed to comply with SFF-8436 QSFP+ specifications, the module uses standard multimode fiber at 850nm and integrates a 38-pin electrical interface compatible with SFI+ and PPI signaling specifications.

Featuring hot-swap support and onboard I²C diagnostic capabilities, Wave2Wave QSFP+ AOCs provide a lightweight, low-profile, and flexible alternative to copper cabling — ideal for deployment lengths from 1m to 300m.

Features and Benefits

- Four-lane, full-duplex 850nm parallel active optical architecture.
- Supports data rates up to 11.1Gbps per channel (40Gbps total).
- Extends to 300m over OM3 multimode fiber.
- Compliant with QSFP+ MSA standards.
- RoHS compliant.
- High-reliability 850nm VCSEL optical transmit technology.
- Hot-pluggable electrical interface for simplified deployment.
- Operating case temperature range: 0°C to 70°C.
- Low power consumption: <1.5W per cable end.

Applications

- 40G Ethernet links.
- InfiniBand QDR systems.
- Fiber Channel networks.
- High-performance computing (HPC) clusters and interconnects.

NOTES:

XX=different cable lengths on Multimode Fiber (MMF)

Ordering Information								
Part Number	Transmitter	Data Rate	Receiver	BER	Reach	Temp	DDM	RoHS
78-Q010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78C-Q010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78A-Q010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78J-Z010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant

NOTES:

1. 77-S010-SR compatible with Generic.
2. 77C-S010-SR compatible with Cisco.
3. 77A-S010-SR compatible with Arista.
4. 77D-S010-SR compatible with Dell.

Absolute Maximum Ratings						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Storage Temperature	Ts	-40	-	85	ºC	-
Relative Humidity	Rh	5	-	95	%	-
Supply Voltage	Vcc	-0.5	-	4.0	V	-

Recommended Operating Conditions						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Operating Case Temperature	Tc	0	25	70	ºC	-
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	-
Power Supply Current	Icc	-	-	450	mA	-
Data Rate	-	-	10.3125	-	Gb/s	-

Electrical Characteristics							
Parameter		**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Module Supply Current		Icc	-	-	450	mA	-
Power Dissipation		P_D	-	-	1500	mW	-
Transmitter							
Input Differential Impedance		Zin	90	100	110	Ω	-
Differential Data Input Swing		$V_{IN,P-P,}$	180	-	1000	mVpp	-
TX_FAULT	Transmitter Fault	V_{OH}	2.0	-	Vcc	V	-
	Normal Operation	V_{OL}	0	-	0.8	V	-
TX_DISABLE	Transmitter Disable	V_{IH}	2.0	-	Vcc	V	-
	Transmitter Enable	V_{IL}	0	-	0.8	V	-
Receiver							
Differential Output Impedance		Zout	90	100	110	Ω	-
Differential Data Output Swing		$V_{OUT,P-P}$	300	-	850	mV	1
Data Output Rise Time, Fall Time		Tr/Tf	28	-	-	ps	2
RX_LOS	Loss of Signal (LOS)	V_{OH}	2.0	-	Vcc	V	-
	Normal Operation	V_{OL}	0	-	0.8	V	-

NOTES:

1. Internally AC coupled, but requires a external 100Ω differential load termination.
2. 20-80%.
3. LOS is an open collector output. Should be pulled up with 4.7KΩ on the host board.

Pin Description			
Pin	**Name**	**Description**	**Notes**
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	-
3	Tx2+	Transmitter Non-Inverted Data output	-
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	-
6	Tx4+	Transmitter Non-Inverted Data output	-
7	GND	Transmitter Ground (Common with Receiver Ground)	1
8	ModSelL	Module Select	2
9	ResetL	Module Reset	2

Pin	Name	Description	Notes
10	VccRx	3.3V Power Supply Receiver	-
11	SCL	2-Wire serial Interface Clock	2
12	SDA	2-Wire serial Interface Data	2
13	GND	Transmitter Ground (Common with Receiver Ground)	1
14	Rx3+	Receiver Non-Inverted Data Output	-
15	Rx3-	Receiver Inverted Data Output	-
16	GND	Transmitter Ground (Common with Receiver Ground)	1
17	Rx1+	Receiver Non-Inverted Data Output	-
18	Rx1-	Receiver Inverted Data Output	-
19	GND	Transmitter Ground (Common with Receiver Ground)	1
20	GND	Transmitter Ground (Common with Receiver Ground)	1
21	Rx2-	Receiver Inverted Data Output	-
22	Rx2+	Receiver Non-Inverted Data Output	-
23	GND	Transmitter Ground (Common with Receiver Ground)	1
24	Rx4-	Receiver Inverted Data Output	1
25	Rx4+	Receiver Non-Inverted Data Output	-
26	GND	Transmitter Ground (Common with Receiver Ground)	1
27	ModPrsl	Module Present	-
28	IntL	Interrupt	2
29	VccTx	3.3V power supply transmitter	-
30	Vcc1	3.3V power supply	-
31	LPMode	Low Power Mode	2
32	GND	Transmitter Ground (Common with Receiver Ground)	1
33	Tx3+	Transmitter Non-Inverted Data Input	-
34	Tx3-	Transmitter Inverted Data Output	-
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	-
37	Tx1-	Transmitter Inverted Data Output	-
38	GND	Transmitter Ground (Common with Receiver Ground)	1

NOTES:

1. GND is the symbol for signal and supply (power) common for QSFP+ modules. 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. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP+ transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

Pin Assignment

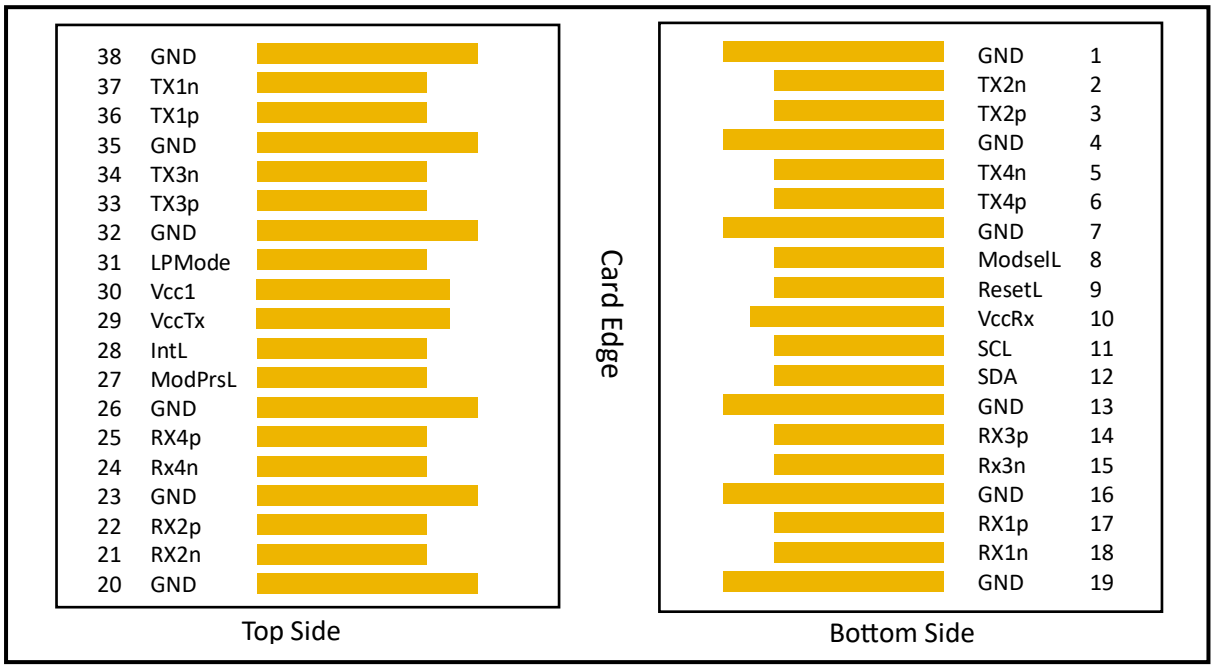


Figure 1. Pin out of Connector Block on Host Board

Electrical Interface

