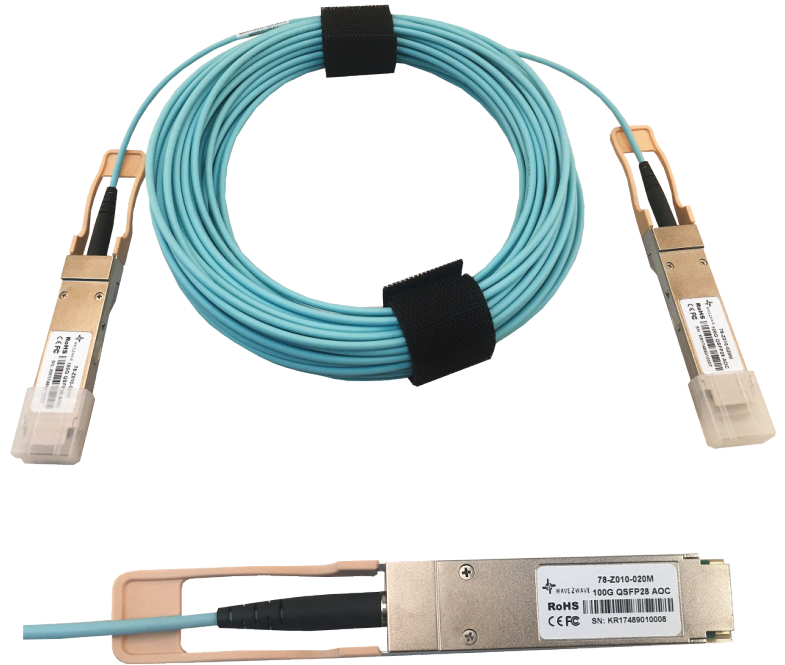


Overview

The Wave2Wave 100G QSFP28 Active Optical Cable (Part #: 78-Z010-XXM) is a Parallel 100Gb/s Quad Small Form-factor, Hot-Pluggable 850nm parallel AOC supporting 100G Ethernet, fiber channel, PCIe and Infiniband. It is compliant with the industry standard SFF-8636 QSFP28 transceiver specifications and IEEE 802.3bm 100GBASE-SR4.

The module integrates 4 full-duplex lanes including 4 independent 850nm VCSEL based transmitters and 4 independent receivers using PIN photo detectors inside. Each lane can operate up to 25.78125Gbps. The cable length is available up to 100m using OM3 fibers. The electrical interface uses a 38-contact edge connector.

The 100G QSFP28 Active Optical Cable features small size, hot-pluggable, low power and high-speed operation. It's suitable for high speed short-reach dense data connections such as 100G BASE-SR4 Ethernet, InfiniBand EDR, and etc.



Features & Benefits

- Compliant to industry standard SFF-8636 QSFP28 Transceiver Specifications
- 4 full-duplex channels with data rate up to 10.315Gbps
- Single 3.3V power supply; low power consumption
- Hot pluggable
- OM3 fiber up to 100m
- RoHS compliant
- 0-70° C case temperature operating range

Applications

- 25G BASE-SR and 100G BASE-SR4 Ethernet
- InfiniBand EDR (4x25G), and QDR (4x10G) with CDR turned off
- High speed parallel interconnects for high performance computing (HPC) and data center interconnects (DCI)

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	3.6	V
Input Voltage	Vin	-0.3	Vcc + 0.3	V
Operating Temperature	Top	-5	70	°C
Storage Temperature	Tst	-20	85	°C
Humidity (non-condensing)	Rh	5	85	%

100G QSFP28 Active Optical Cable (AOC)

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	-5	-	70	°C
Supply Voltage	Vcc	3.135	3.3	3.465	V
Data Rate Per Line			25.78125		Gbps
Total Data Rate			103.125		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
Fiber Bend Radius	Rb	3			cm

Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Consumption				3.5	W	Single end
Maximum Peak Current				1000	mA	Single end
Transceiver Power-On Initialization Time	Tinit			2000	ms	
Transmitter Specifications (per lane)						
Differential Input Impedance	Zind	90	100	110	ohm	AC couple inside module
Differential Input Voltage Peak-to-Peak Swing	Vinpp			900	mV	
Common-mode Noise (RMS)				17.5	mV	
Differential input return loss	SDD22	Per OIF CEI-28G-VSR and CAUI-4 requirements				dB
Common Mode to Differential Conversion and Differential to Common Mode Conversion	SDC22 SCD22					dB
Common Mode Return Loss	SCC22					dB
Common Mode Voltage	Vcm	-0.3		2.8	dB	
Eye Width at 1E-15 probability	EW15	0.46			V	
Eye Height at 1E-15 probability	EH15	95			mV	
Receiver specifications (per lane)						
Differential output impedance	Zod	90	100	110	ohm	AC couple inside module
Differential data output voltage peak-to-peak swing	Vopp	300		900	mV	
Common Mode Voltage	Vcm	-0.35		2.85	V	
Common Mode Noise				17.5	mV	

100G QSFP28 Active Optical Cable (AOC)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Differential input return loss	SDD22	Per OIF CEI-28G-VSR and CAUI-4 requirements			dB	
Common Mode to Differential Conversion and Differential to Common Mode Conversion	SDC22 SCD22				dB	
Common Mode Return Loss	SCC22			-2	dB	
Vertical Eye Closure	VEC			5.5	dB	
Eye Width at 1E-15 probability	EW15	0.57			UI	
Eye Height at 1E-15 probability	EH15	228			mV	

Pin Assignment

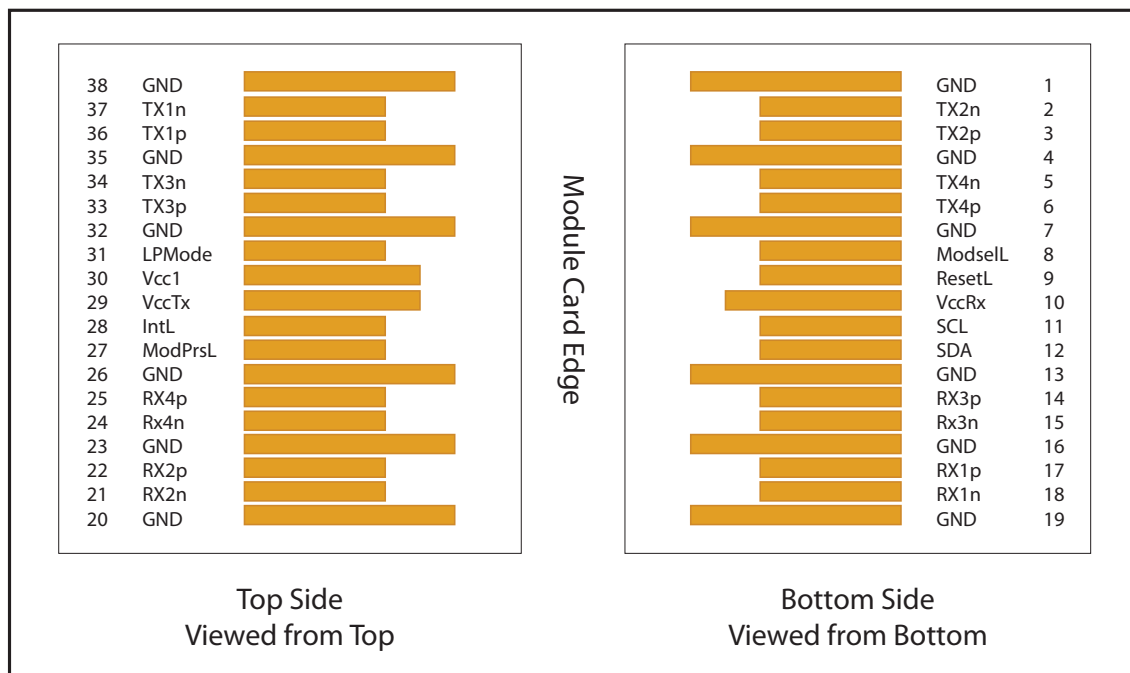


Figure 1. QSFP+ MSA Compliant 38-pin connector

Pin Description

Pin	Name	Description	Notes
1	GND	Module Ground	1
2	Tx2n	Transmitter inverted data input	
3	Tx2p	Transmitter non-inverted data input	
4	GND	Module Ground	1
5	Tx4n	Transmitter inverted data input	
6	Tx4p	Transmitter non-inverted data input	
7	GND	Module Ground	1

100G QSFP28 Active Optical Cable (AOC)

Pin	Name	Description	Notes
8	ModSelL	Module Select	3
9	ResetL	Module Reset	3
10	Vcc Rx	+3.3V Power Supply Receiver	2
11	SCL	2-wire serial interface clock	3
12	SDA	2-wire serial interface data	3
13	GND	Module Ground	1
14	Rx3p	Receiver non-inverted data output	
15	Rx3n	Receiver inverted data output	
16	GND	Module Ground	1
17	Rx1p	Receiver non-inverted data output	
18	Rx1n	Receiver inverted data output	
19	GND	Module Ground	1
20	GND	Module Ground	1
21	Rx2n	Receiver inverted data output	
22	Rx2p	Receiver non-inverted data output	
23	GND	Module Ground	1
24	Rx4n	Receiver inverted data output	
25	Rx4p	Receiver non-inverted data output	
26	GND	Module Ground (internally pulled down to GND)	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	3
29	Vcc Tx	+3.3V Power Supply Transmitter	2
30	Vcc1	+3.3V Power Supply	2
31	LPMODE	Low power mode	
32	GND	Module Ground	1
33	Tx3p	Transmitter non-inverted data input	
34	Tx2n	Transmitter inverted data input	
35	GND	Module Ground	1
36	Tx1p	Transmitter non-inverted data input	
37	Tx1n	Transmitter inverted data input	
38	GND	Module Ground	1

Notes:

1. GND is the signal and supply (power) common for the QSFP28 module. It is isolated from module chassis ground within the module. All the common within the QSFP28 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 Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and VccTx may be internally connected within the QSFP28 module in any combination. The connector pins are each rated for a maximum current of 500 mA.
3. Open collector, should be pulled up with 4.7k~10k ohms on host board to a voltage between 3.15V and 3.6V.