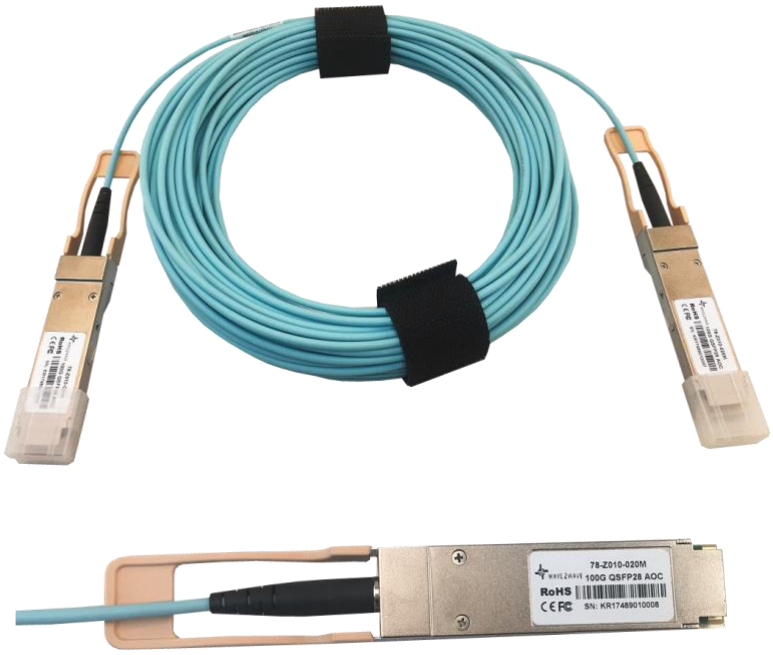
100G QSFP28 Active Optical Cable (AOC)

Overview

The Wave2Wave 100G QSFP28 Active Optical Cable (Part #: 78-Z010-XXM) delivers high-density, high-bandwidth interconnect performance for modern data-centric environments. Designed for 100G Ethernet, Fibre Channel, PCIe, and InfiniBand, this hot-pluggable solution meets SFF-8636 and IEEE 802.3bm 100GBASE-SR4 standards.

The module integrates 4 independent full-duplex 25G optical lanes, utilizing 850nm VCSEL transmitters and PIN photodiode receivers. It supports transmission distances up to 100 meters over OM3 fiber, and interfaces through a 38-contact edge connector.

Compact, efficient, and engineered for reliability, the 100G QSFP28 AOC is ideal for high-density short-reach interconnects in data centers, HPC clusters, and high-performance networking applications.



Features and Benefits

- Fully compliant with SFF-8636 QSFP28 transceiver standards.
- 4 full-duplex channels up to 25.78Gbps per lane (100Gbps aggregate).
- Single 3.3V power supply with ultra-low power consumption.
- Hot-pluggable design for fast deployment and maintenance.
- Supports OM3 fiber up to 100 meters.
- RoHS compliant.
- Operating case temperature: 0°C to 70°C.

Applications

- 25G BASE-SR and 100G BASE-SR4 Ethernet networks.
- InfiniBand EDR (4×25G) and QDR (4×10G, CDR off).
- High-speed parallel links for **HPC environments.**
- **Data center interconnects (DCI)** and cloud infrastructure.

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	%

Recommended Operating Conditions					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Operating Case Temperature	Tc	-5	-	70	ºC
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	

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

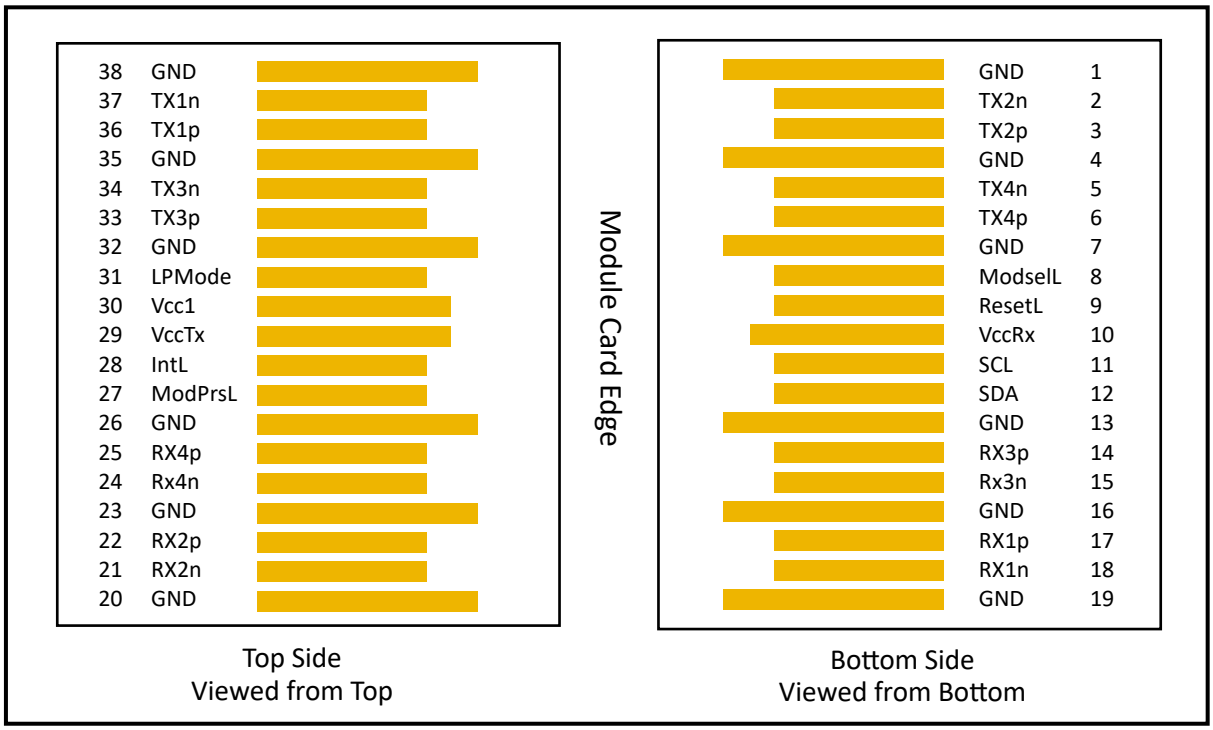


Figure 1. QSFP+ MSA Compliant 38-pin connector

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

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.