PRODUCT SPECIFICATION

Part No.:	QSFP28-100G-AOCxM	
Description:	100G QSFP28 to QSFP28 Active Optical Cable, MMF 850nm 1-100m	
Release Date	**Rev.**	**Revision Change Description**
2016/09/16	A0	New Release
2021/02/14	A1	Template Update
2025/12/19	A2	Update the Mechanical Drawing

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Features

- ✧ Hot-pluggable QSFP28 form factor
- ✧ 4 high-speed full duplex channels
- ✧ Supports 103.1Gb/s aggregate bit rate
- ✧ 4x25Gbps 850nm VCSEL laser
- ✧ QSFP28 MSA compliant
- ✧ Operating environment temperature 0 ~ 70℃
- ✧ Low power dissipation:<3.5W per cable end(<2.5W with CDRs off)
- ✧ Available in lengths of 1 to 100 meters
- ✧ RoHS-6 compliant

Application

- ✧ 100 Gigabit Ethernet links
- ✧ Infiniband interconnect
- ✧ Data center cabling infrastructure
- ✧ High density connections between networking equipment

Standard

- ✧ SFF-8431 SFP+ Electrical MSA
- ✧ SFF-8432 SFP+ Mechanical MSA
- ✧ RoHS complaint

Specification

Absolute Maximum Ratings				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	RH	0	85	%
Supply Voltage	Vcc	-0.5	4.0	V

Recommended Operating Conditions					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Operating Case Temperature	Tc	0		+70	°C
Supply Voltage	Vcc	3.14	3.3	3.46	V
Supply Current	Icc			300	mA
Bit Rate	BR		25.78		Each channel

Electrical Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Transmitter Characteristics						
Signaling rate, each lane	DRpl		25.78125		Gb/s	1
Center Wavelengthe	λ	840	850	860	nm	
RMS Spectral Width			0.6		nm	
Average launch power, each lane	Pavg	-8.4		2.4	dBm	
Optical modulation amplitude, each lane (OMA)	OMA	-6.4		3	dBm	
Extinction ratio	ER	2			dB	
Average Launch Power of OFF Transmitter, per Lane	RIN			-30	dBm	
Encircled Flux	FLX	>86% at 19 um <30% at 4.5 um			dBm	
Optical return loss tolerance				12	dB	
Transmitter eye mask {X1, X2, X3, Y1, Y2, Y3}		{0.3,0.38,0.45,0.35,0.41,0.5}				2
Receiver Characteristics						
Receive Rate for Each Lane	DRpl		25.78125		Gb/s	3
Four Lane Wavelength Range	λ	840	850	860	nm	
Overload Input Optical Power	Pmax	3.4			dBm	
Average Receive Power for Each Lane	Pin	-10.3		2.4	dBm	4
Receiver Sensitivity(OMA)per lane	Psens		-5.2		dB	

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Recevier Reflectance	Rfl			-12	dB	
Receiver Eye MaskDefinition {X1, X2, X3, Y1, Y2,Y3}		{0.28,0.5,0.5,0.33,0.33,0.4}				5
Los De-Assert	Pd			-13	dBm	
Los Assert	Pa	-30			dBm	
Loss Hysteresis	Pd-Pa	0.5			dBm	

Note1. Transmitter consists of 4 lasers operating at a maximum speed of 25.78125Gb/s ±100ppm each.

Note2. Hit Ratio 1.5 x 10-3 hits/sample.

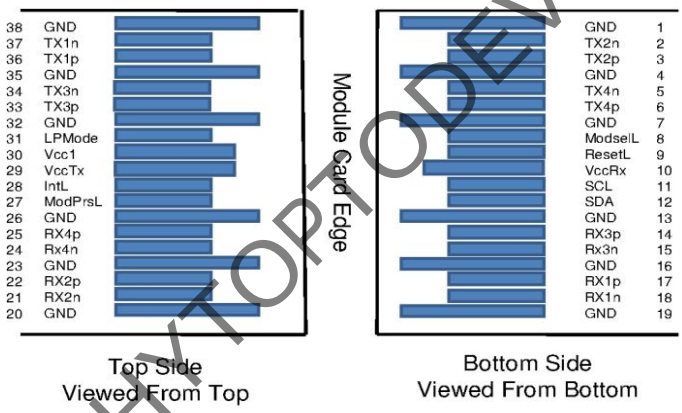
Note3. Receiver consists of 4 photodetectors operating at a maximum speed of 25.78125Gb/s ±100ppm each.

Note4. Minimum value is informative only and not the principal indicator of signal strength.

Note5. Hit Ratio 5 x 10-5 hits/sample.

Pin definition

The QSFP28 modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The QSFP228 host connector is a 0.8 mm pitch 20 position right angle improved connector specified by SFF-8431, or stacked connector with equivalent electrical performance. SFP+ module contacts mates with the host in the order of ground, power, followed by signal as illustrated by Figure 1 and the contact sequence order listed in Table 1.



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QSFP28 Pad assignment Top View

Table 1

Pin	Symbol	Name/Description	Notes
1	GND	Transmitter Ground (Common with Receiver 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	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	

10	Vcc Rx	+3.3 V 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	1
17	RX1P	Receiver Non-Inverted Data Output	
18	RX1N	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	RX2N	Receiver Inverted Data Output	
22	RX2P	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	RX4N	Receiver Inverted Data Output	1
25	RX4P	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3 V Power supply transmitter	2
30	Vcc1	+3.3 V 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

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Power Seq.: Pin engagement sequence during hot plugging.

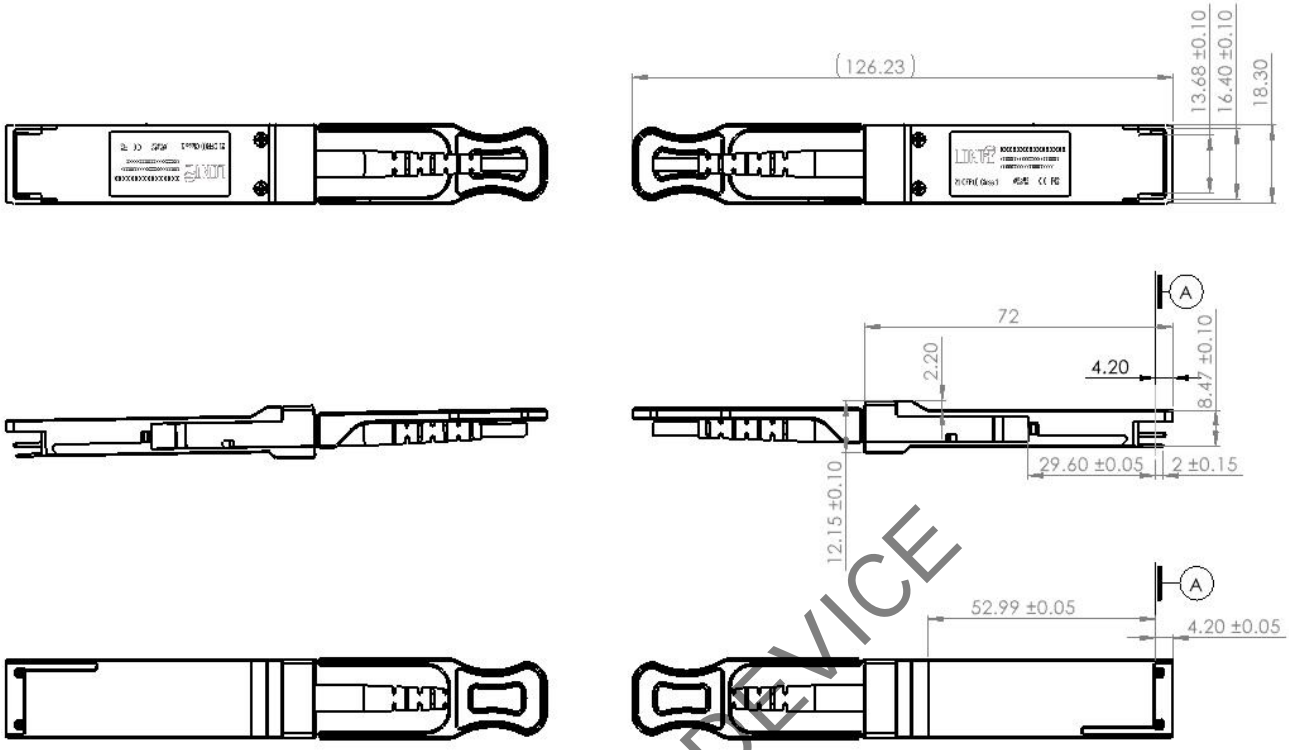
Notes:

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are 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. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown in Figure 3 below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

Mechanical Drawing

Dimensions are in millimeters. All dimensions are ±0.2mm unless otherwise specified. (unit: mm)



Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000Vfor other pins.)
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product

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Order Information

Part Number	Product Description
QSFP28-100G-AOCxM	100G QSFP28 to QSFP28 Active Optical Cable 1-100m

Notes:

Where "x" denotes cable length in meters. Examples are as follows:

x = 01 for 1m, x = 10 for 10m, x = 50 for 50m, x = 1 A for 100m.

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