PRODUCT SPECIFICATION

Part No.:	**QSFP28-100G-LR**	
Description:	100G QSFP28 LR1 Transceiver, SMF CWDM 10km	
Release Date	**Rev.**	**Revision Change Description**
2017/06/17	**A0**	New Release
2020/11/28	**A1**	Template Update
2021/03/30	**A2**	BER Spec changed from BER<10^{-12} to BER<$5x10^{-5;}$
2025/11/14	**A3**	1. Wavelength Range changed from 1310nm to CWDM

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Features

- ✧ Supports 106.25Gb/s PAM4.
- ✧ Digital Diagnostics Monitoring Interface
- ✧ Built-in 100G PAM4 DSP
- ✧ Up to 10km reach over SMF(G.652)
- ✧ Hot Pluggable
- ✧ 4x25.78125Gbit/s NRZ electrical interface
- ✧ 1 channel full-duplex transceiver modules
- ✧ Duplex LC receptacles
- ✧ Commercial operating case temperature range: 0~ 70ºC
- ✧ RoHS-6 Compliant
- ✧ Power dissipation < 4.5 W
- ✧ TDEC<3.4dB

Application

- ✧ 100G Ethernet
- ✧ Data center
- ✧ Infiniband QDR
- ✧ Fiber channel

Standard

- ✧ 100G Lambda MSA 100G-LR specification
- ✧ QSFP MSA compliant
- ✧ Compliant to SFF-8636 Rev2.10a

Specification:

Absolute Maximum Ratings				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Storage Ambient Temperature	T_{STG}	-20	85	℃
Operating Humidity	H_O	5	85	%
Power Supply Voltage	Vcc	-0.3	3.6	V
Signal Input Voltage		Vcc-0.3	Vcc +0.3	V

Recommended Operating Conditions					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Operating Case Temperature	Tc	0		70	℃
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	ICC			1060	mA
Data Rate,each Lane			106.25		Gbps
Fiber Length 9/125μm core SMF		-	10	-	km

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Optical transmitter Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Launched Power (avg.) Per Lane	Pavg	-1.4		4.5	dBm	
Wavelength Range	λC	1264.5	1271	1277.5	nm	
Wavelength Range		1284.5	1291	1297.5		
Wavelength Range		1304.5	1311	1317.5		
Wavelength Range		1324.5	1331	1337.5		
Spectral Width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	3.5			dB	
Transmitter OFF Output Power	POff			-30	dBm	
Optical Modulation Amplitude(OMA outer)	OMA	0.7		4.7	dBm	
Transmitter and dispersion eye closure(TDEC)	TDEC			3.4	dB	

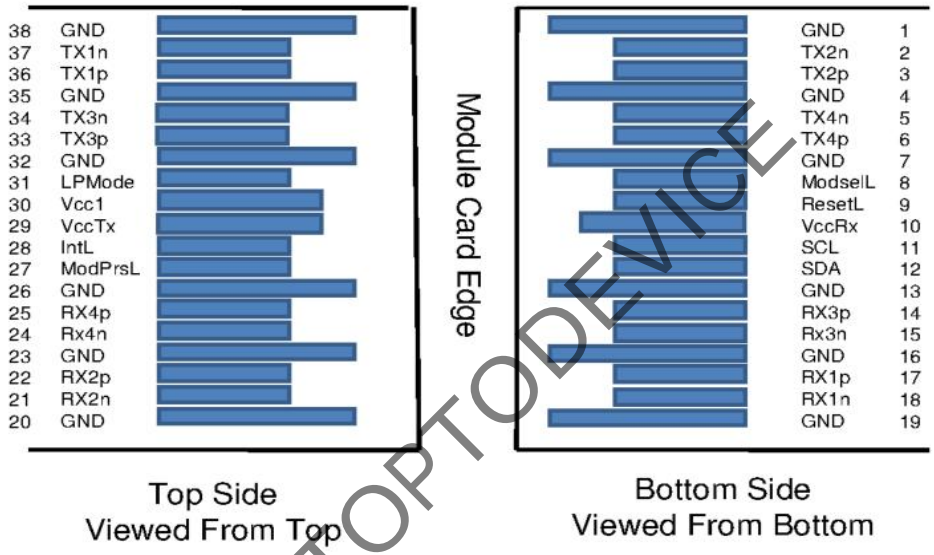
Optical receiver Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Receiver Wavelength Range	λc	1264.5	-	1616.5	nm	

Average Receiver Power Per Lane			-10		4	dBm	
Receiver Sensitivity Per Lane		S			-6.1	dBm	1
Optical Power Input Overload		P_{in-max}	4.5			dBm	
LOS	Optical De-assert	Pd		-11		dBm	
	Optical Assert	Pa		-13			
Receiver Reflectance		Rr			-26	dB	

Notes:

1. Measured with a PRBS 2^{31}-1 test pattern, @25.78Gb/s, BER<5x10-^{5}

Pin Definition



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Figure1 QSFP MSA-compliant 38-pin connector

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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Table 1: QSFP28 Module PIN Definition

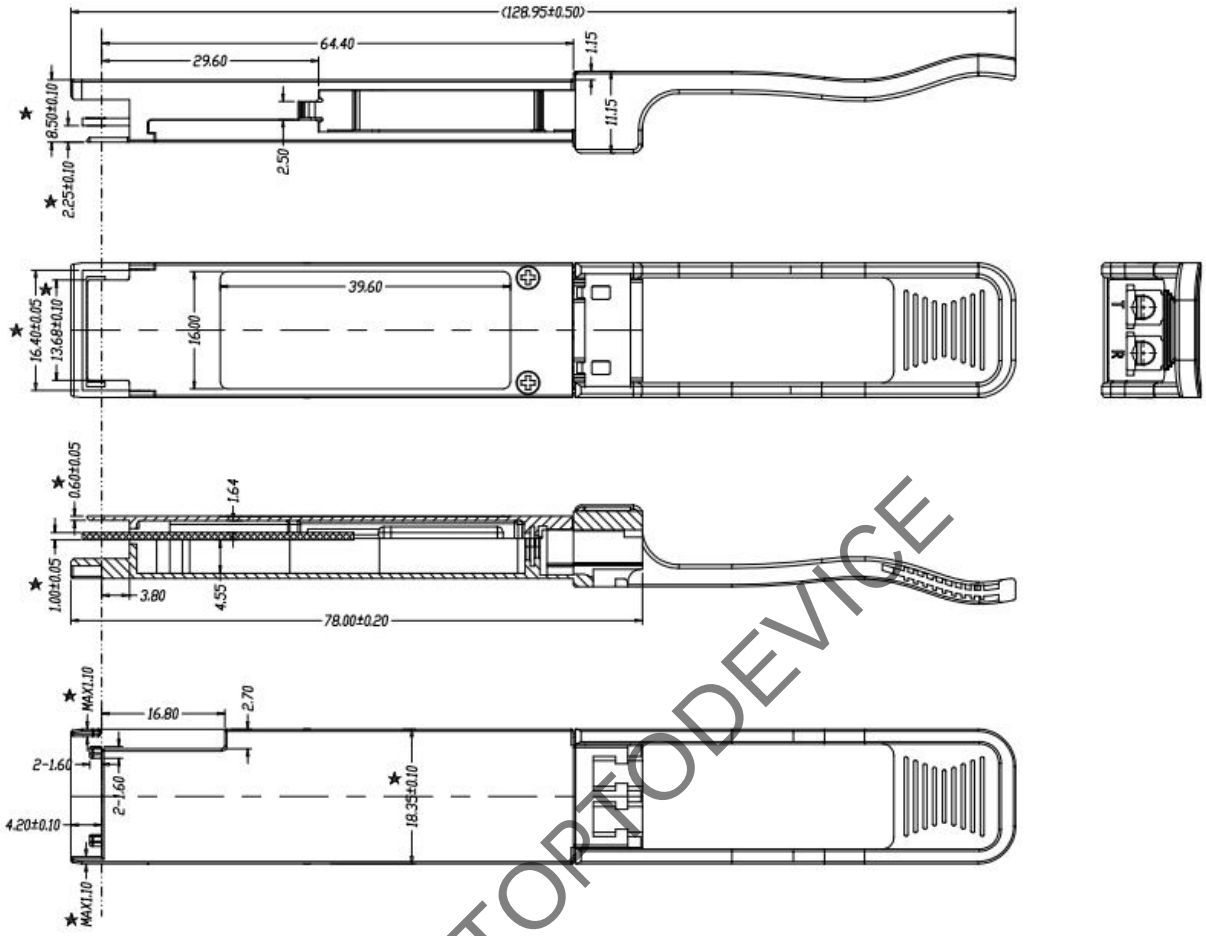
Notes：

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.

Package Outline

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



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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

Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (℃)	Reach (KM)	DDM
QSFP28-100G-LR	QSFP28	100G	CWDM EML	-1.4~4.5	PIN	＜-6.1	0~70	10	Y

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