

# PRODUCT SPECIFICATION

<b>Part No.:</b>	<b>AC-QP-Q3G100-10</b>	
<b>Description:</b>	100G QSFP28 Transceiver, LR4 10km	
<b>Release Date</b>	<b>Rev.</b>	<b>Revision Change Description</b>
<b>2015/06/07</b>	<b>A0</b>	New Release
<b>2020/12/28</b>	<b>A1</b>	Template Update
<b>2021/03/30</b>	<b>A2</b>	BER Spec changed from BER<10 <sup>-12</sup> BER<5x10 <sup>-5</sup> ; Update the Part No from Q1 to Q3
<b>2022/10/28</b>	<b>A3</b>	Update the Package Outline Mechanical Drawing

## Features

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- ✧ Transmission data rate up to 26Gbps per channel
- ✧ 4 channels full-duplex transceiver modules
- ✧ 4 x 25Gb/s DFB-based LWDM uncooled transmitter
- ✧ 4 channels PIN ROSA
- ✧ Internal CDR circuits on both receiver and transmitter channels
- ✧ Duplex LC optical receptacle
- ✧ Built- in digital diagnostic functions
- ✧ Hot Pluggable QSFP form factor
- ✧ Up to reach 10km for SMF
- ✧ Compliant with QSFP28 MSA with LC connector
- ✧ Commercial operating case temperature range: 0~70°C
- ✧ RoHS-6 Compliant
- ✧ Power dissipation < 3.5 W

## Application

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- ✧ Data Center Interconnect
- ✧ 100G LWDM4 applications
- ✧ Infiniband EDR interconnects
- ✧ Enterprise networking

## Standard

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- ✧ Compliant to IEEE 802.3bm
- ✧ Compliant with QSFP28 MSA
- ✧ Compliant to SFF-8436

## Specification:

Absolute Maximum Ratings				
Parameter	Symbol	Min	Max	Unit
Storage Ambient Temperature	T <sub>STG</sub>	-40	85	°C
Operating Humidity	H <sub>O</sub>	5	95	%
Power Supply Voltage	V <sub>CC</sub>	-0.3	4	V
Signal Input Voltage		V <sub>CC</sub> -0.3	V <sub>CC</sub> +0.3	V
Damage Threshold, each Lane	TH		5.5	dBm

Recommended Operating Conditions					
Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T <sub>c</sub>	0		70	°C
Power Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Power Supply Current	I <sub>CC</sub>			1060	mA
Data Rate,each Lane			25.78125		Gbps
Link Distance with SMF	D			10	km

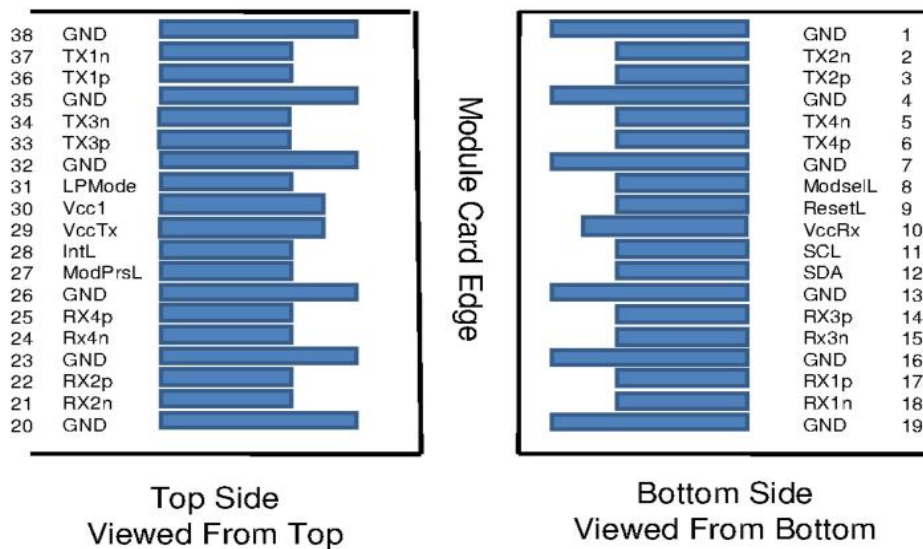
Optical transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.)	P <sub>avg</sub>	-6.5		2.5	dBm	
Total Output. Power	P <sub>out</sub>			8.5	dBm	
OMA, each Lane	P <sub>OMA</sub>	-4		2.5	dBm	
TDP, each Lane	TDP			3	dB	
Wavelength Assignment	λ <sub>0</sub>	1294.53	1295.56	1296.59	nm	
	λ <sub>1</sub>	1299.02	1300.05	1301.09		
	λ <sub>2</sub>	1303.54	1304.58	1305.63		
	λ <sub>3</sub>	1308.09	1309.14	1310.19		
Spectral Width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	3			dB	
Transmitter OFF Output Power	P <sub>Off</sub>			-30	dBm	
Differential Line Input Impedance	R <sub>IN</sub>			-130	Ohm	
Output Eye Mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				
Output Eye Diagram		Compliant with IEEE802.3ae eye mask				

Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity	S			-11.5	dBm	1
Stressed Receiver Sensitivity (OMA), each Lane				-7.3	dBm	
Average Receive Power, each lane		-11.5		2.5	dBm	
Receive Power (OMA), each lane				2.5	dBm	
Receiver Electrical 3 dB upper Cutoff Frequency, each Fc Lane	FC			31	GHz	
Optical Power Input Overload	P <sub>in-max</sub>	4.5			dBm	
LOS	Optical De-assert	Pd		-14	dBm	
	Optical Assert	Pa		-16		
LOS Hysteresis	LOSH	0.5		2	dB	
Vertical Eye Closure Penalty	VECP	1.9			dB	
Stressed Eye J2 Jitter	J2	0.33			UI	
Stressed Eye J4 Jitter	J4	0.48			UI	

**Notes:**

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

**Pin Definition**



**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	

Add: 2-4# Building, Tongfuyu Industrial Zone, Ai qun Road, Shiyan street, Baoan District, Shen zhen, China.  
 Tel: +86-755-8891 4745 Fax: +86-755-2946 6959 E-mail: sales@lonte.com.cn www.lonte.com.cn

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

**Table 1: QSFP Module PIN Definition**

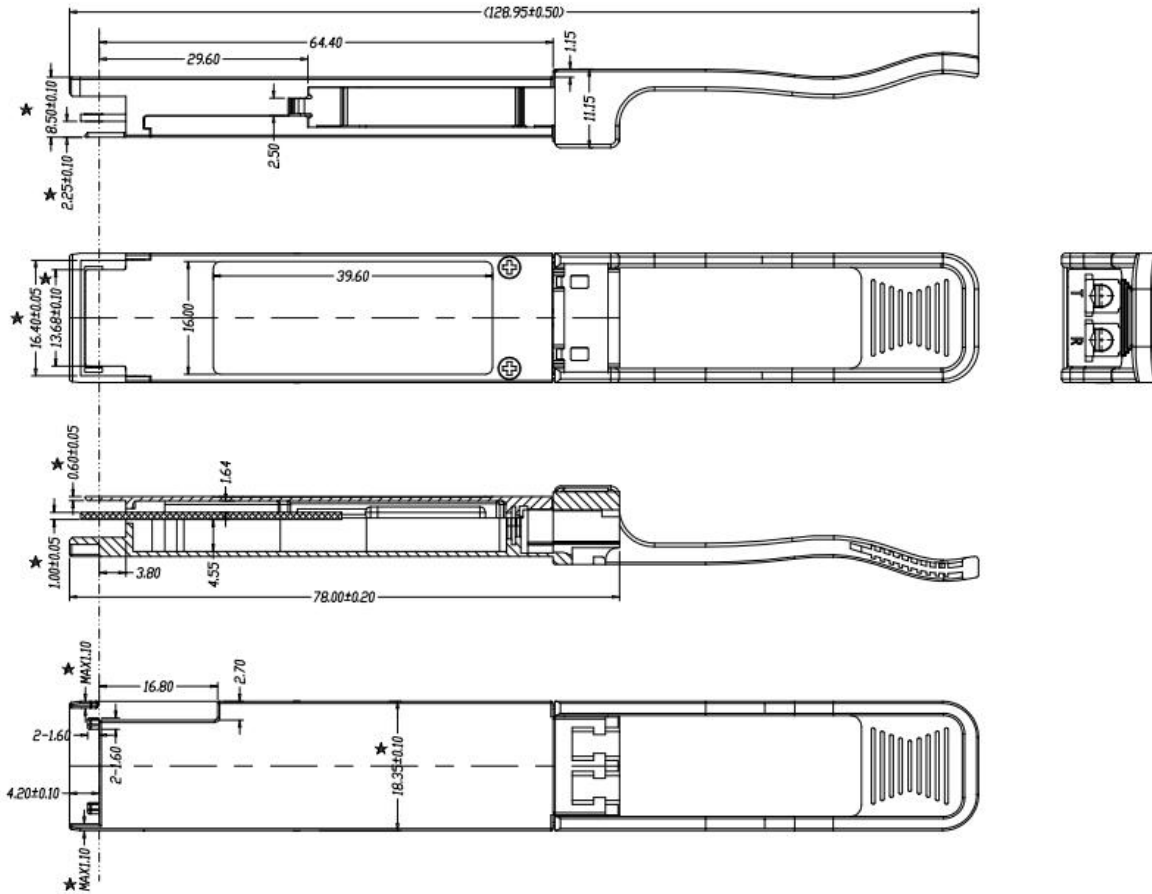
**Notes:**

1. Module circuit ground is isolated from module chassis ground within the module.

2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

## Package Outline

Dimensions are in millimeters. All dimensions are  $\pm 0.2$ mm 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, >2000V for 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 (°C)	Reach (KM)	DDM
AC-QP-Q3G100-10	QSFP28	100G	DFB LWDM	-6.2~2.5	PIN	<-11.5	0~70	10	Y