

PRODUCT SPECIFICATION

Part No.:	AC-QPBL-23G100-10/AC-QPBL-32G100-10	
Description:	100G QSFP28 Transceiver, BIDI Tx1271nm/Rx1331nm 10km 100G QSFP28 Transceiver, BIDI Tx1331nm/Rx1271nm 10km	
Release Date	Rev.	Revision Change Description
2022/06/07	A0	New Release

Features

- ✧ Supports 106.25Gb/s PAM4.
- ✧ Digital Diagnostics Monitoring Interface
- ✧ Built-in 100G PAM4 DSP
- ✧ Up to 10km reach over SMF
- ✧ Hot Pluggable
- ✧ 1271nm EML laser and PIN receiver for AC-QPBL-23G100-10
- ✧ 1331nm EML laser and PIN receiver for AC-QPBL-32G100-10
- ✧ BIDI LC receptacle
- ✧ Operating temperature range:
 - ✧ Commercial: 0℃~+70℃
 - ✧ Industrial: -40℃~+85℃
- ✧ RoHS-6 Compliant
- ✧ Power dissipation < 3.5 W
- ✧ TDECQ<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}	-40	85	°C
Operating Humidity	H _O	5	85	%
Power Supply Voltage	V _{cc}	-0.3	3.6	V
Signal Input Voltage		V _{cc} -0.3	V _{cc} +0.3	V

Recommended Operating Conditions						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature (Commercial)	T _c	0		70	°C	
Operating Case Temperature (Industrial)		-40		85		
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Date Rate per Channel (4*25G NRZ)			25.78125		Gbps	
Date Rate per Channel (2*50G PAM4)			53.125		Gbps	
Bit Error Ratio (BER) with FEC on			10 ⁻¹²			1&2
Bit Error Ratio (BER) without FEC			2.4x10 ⁻⁴			1&2
Fiber Length 9/125μm core SMF		-	-	10	km	

Notes:

1. Bit-Error-Rate (BER) is tested with PRBS 31 pattern.
2. 100G QSFP28 LR1 requires an electrical connector compliant with QSFP28 MSA which is used on the host board in order to guarantee its electrical interface specification.

Optical transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.) Per Lane	P _{avg}	-1.9		4.8	dBm	
Wavelength Range	λ ₀	1264.5 1324.5	1271 1331	1277.5 1337.5	nm	
Spectral Width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	3.5			dB	
Transmitter OFF Output Power	P _{off}			-30	dBm	
Optical Modulation Amplitude(OMA outer)	OMA	0.7		4.7	dBm	
Transmitter and dispersion eye closure(TDECQ)	TDECQ			3.4	dB	

Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Wavelength Range		1324.5 1264.5	1331 1271	1337.5 1277.5	nm	
Average Receiver Power Per Lane		-7.7		4.5	dBm	
Receiver sensitivity (OMA _{outer})				-7.5	dBm	
Stressed receiver sensitivity (OMA _{outer})				-5.1	dBm	
Optical Power Input Overload	P _{in-max}	5			dBm	
Receiver Reflectance	R _r			-26	dB	

Pin Definition

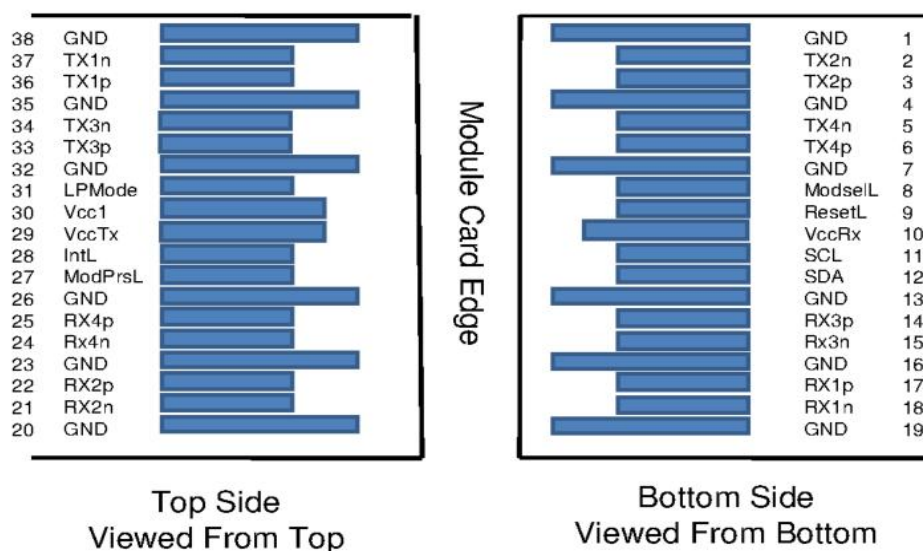


Figure1 QSFP MSA-compliant 38-pin connector

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	
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: 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.

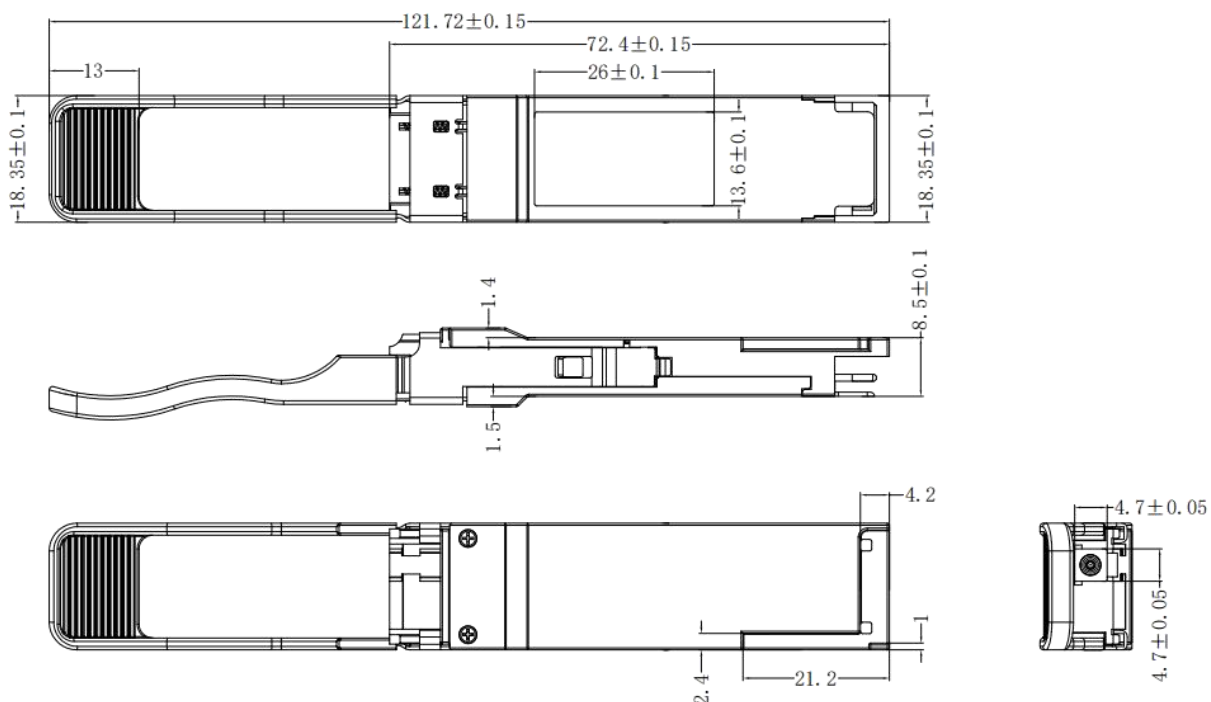
DDMI Requirement

Parameters	Unit	Requirements	Note
Temperature	℃	±3	
Voltage	V	±3%	
Bias Current	mA	±10%	
Rx Power	dB	±3	1. Range from the LOS assert power to the overload power 2. The value of Rx DDM should be ≤-40 dBm when there is no power input 3. The value of Rx DDM should be -40dBm when LOS is asserted
Tx Power	dB	±3	The value of Tx DDM should be ≤-40dBm when tx-disable is asserted by software or hardware

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

Mechanical Dimensions



Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (°C)	Reach (KM)	DDM
AC-QPBL-23G100-10	QSFP28	100G	EML 1271nm	-1.9~4.8	PIN	<-7.5	0~70	10	Y
AC-QPBL-32G100-10	QSFP28	100G	EML 1331nm	-1.9~4.8	PIN	<-7.5	0~70	10	Y
AC-QPBL-23G100-10F	QSFP28	100G	EML 1271nm	-1.9~4.8	PIN	<-7.5	-40~85	10	Y
AC-QPBL-32G100-10F	QSFP28	100G	EML 1331nm	-1.9~4.8	PIN	<-7.5	-40~85	10	Y