

## **Q28-100GP4-BXU2733-LR410C-AO**

Cisco® Compatible TAA 100GBase-BX QSFP28 Transceiver (SMF, 1271nmTx/1331nmRx, 10km w/FEC, LC, DOM)

### **Features**

- Compliant with 100G Lambda MSA 100G-LR Specifications
- Single 3.3V Power Supply
- Compliant with SFF-8636 Rev 2.10a
- Single-mode Fiber
- Bidi LC Connectors
- Power dissipation
- Hot Pluggable
- Commercial Temperature 0 to 70 Celsius
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### **Applications**

- Datacenter
- 100GBase Ethernet

### **Product Description**

This Cisco® compatible QSFP28 transceiver provides 100GBase-BX throughput up to 10km w/host FEC over single-mode fiber (SMF) using a wavelength of 1271nmTx/1331nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Cisco®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products."



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS: compliant with EU RoHS 2.0 directive 2015/863/EU.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity	RH	5		85	%	
Damage Threshold	RXdmg	5.5			dBm	

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	P <sub>DISS</sub>			4.5	W	
<b>Transmitter</b>						
Differential Data Input Swing Per Lane		900			mVp-p	
Differential Input Impedance	ZIN	90	100	110	Ω	
DC Common-Mode Voltage (Vcm)		-350		2850	mV	
<b>Receiver</b>						
Differential Output Amplitude				900	mVp-p	
Differential Output Impedance	ZOUT	90	100	110	Ω	
Output Rise/Fall Time	Tr/Tf	12			ps	20-80%
Eye Width		0.57			UI	
Eye Height Differential		228			mV	@TP4, 1E <sup>-15</sup>
DC Common-Mode Voltage (Vcm)		-350		2850	mV	1

### Notes:

- Vcm is generated by the host. Specification includes effects of ground offset voltage.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
<b>Signaling Speed</b>			53.125		GBd	
<b>Modulation Format</b>		PAM4				
<b>Center Wavelength</b>	$\lambda$ C	1264.5	1271	1277.5	nm	
<b>Side-Mode Suppression Ratio</b>	SMSR	30			dB	
<b>Extinction Ratio</b>	ER	3.5			dB	
<b>Transmit OMA</b>	TxOMA	0.7		4.7	dBm	
<b>Transmit Average Power</b>	TxAVG	-1.4		4.5	dBm	1
<b>Launch Power in OMAouter Minus TDECQ</b>		-0.7			dBm	2
<b>Launch Power in OMAouter Minus TDECQ</b>		-0.6			dBm	3
<b>Transmitter and Dispersion Eye Closure</b>	TDECQ			3.4	dB	
<b>Launch Power of Off Transmitter Per Lane</b>				-30	dBm	
<b>Relative Intensity Noise</b>	RIN			-136	dB/Hz	
<b>Optical Return Loss Tolerance</b>				15.6	dB	4
<b>Transmitter Reflectance</b>				-26	dB	
<b>Receiver</b>						
<b>Signaling Speed</b>			53.125		GBd	
<b>Center Wavelength</b>	$\lambda$ C	1324.5	1331	1337.5	nm	
<b>Damage Threshold</b>		5.5			dBm	
<b>Receive Power (OMAouter)</b>	RxOMA			4.7	dBm	
<b>Average Receive Power</b>	RxAVG	-7.7		4.5	dBm	
<b>Receiver Sensitivity (OMAouter)</b>	SenOMA			MAX (-6.1, SECQ-7.5)	dBm	5
<b>Stressed Sensitivity</b>	SRS			-4.1	dBm	
<b>Receiver Reflectance</b>				-26	dB	
<b>LOS Assert</b>	LOSA	-26		-12	dBm	
<b>LOS De-Assert</b>	LOSD			-10	dBm	

### Notes:

1. Average launch power (minimum) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. For  $ER \geq 4.5 \text{ dB}$ .
3. For  $ER < 4.5 \text{ dB}$ .
4. Transmitter reflectance is defined looking into the transmitter.
5. Sensitivity is specified at  $2.4 \times 10^{-4} \text{ BER}$ .

## Pin Descriptions

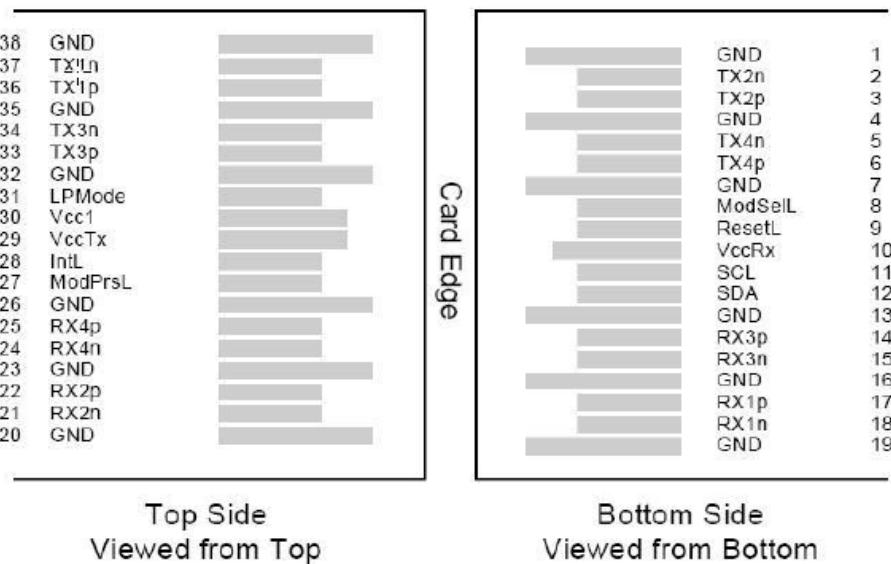
Pin	Logic	Symbol	Name/Descriptions	Notes
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Output.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Output.	
7		GND	Module Ground.	1
8	LVTLL-I	ModSell	Module Select.	
9	LVTLL-I	ResetL	Module Reset.	
10		VccRx	+3.3V Receiver Power Supply.	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
13		GND	Module Ground.	
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	
15	CML-O	Rx3-	Receiver Inverted Data Output.	
16		GND	Module Ground.	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	
18	CML-O	Rx1-	Receiver Inverted Data Output.	
19		GND	Module Ground.	1
20		GND	Module Ground.	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	
23		GND	Module Ground.	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	1
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	
26		GND	Module Ground.	1
27	LVTTL-O	ModPrsL	Module Present.	
28	LVTTL-O	IntL	Interrupt.	
29		VccTx	+3.3V Transmitter Power Supply.	2
30		Vcc1	+3.3V Power Supply.	2
31	LVTLL-I	LPMode	Low-Power Mode.	
32		GND	Module Ground.	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	
34	CML-I	Tx3-	Transmitter Inverted Data Output.	
35		GND	Module Ground.	1

<b>36</b>	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	
<b>37</b>	CML-I	Tx1-	Transmitter Inverted Data Output.	
<b>38</b>		GND	Module Ground.	1

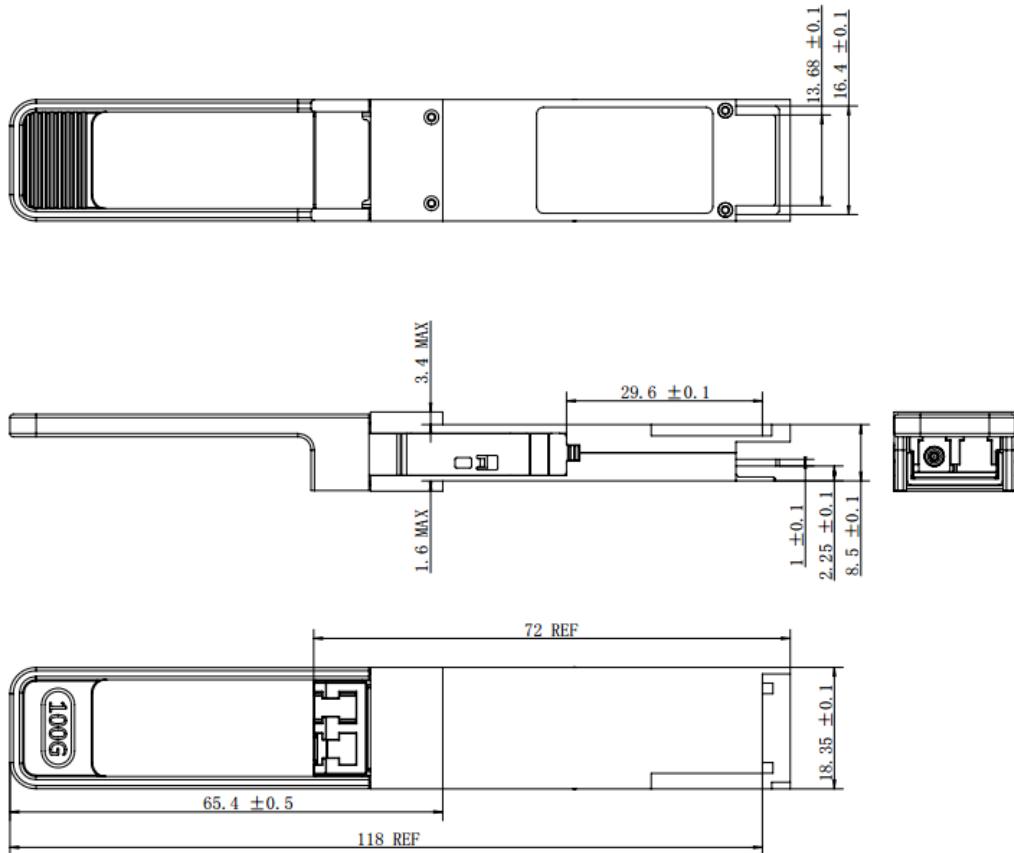
**Notes:**

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. 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 receiver and transmitter power supplies and shall be applied concurrently. Recommended host board power supply filtering is shown below. VccRx, Vcc1, and VccTx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.

**Electrical Pin-Out Details**



## Mechanical Specifications



## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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