

## Q28-100GP4-BXD3327-10-I-AR-AO

Arista Networks® Compatible TAA 100GBase-BX QSFP28 Transceiver Single Lambda (SMF, 1331nmTx/1271nmRx, 10km w/FEC, LC, DOM, -40 to 85C)

### Features

- Compliant with 100G Lambda MSA 100G-LR Specifications
- Single 3.3V Power Supply
- Compliant with SFF-8636
- Bidi LC Connectors
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Metal with Lower EMI
- Hot Pluggable
- RoHS Compliant and Lead Free
- Excellent ESD Protection



### Applications

- Datacenter
- 100GBase Ethernet

### Product Description

This Arista Networks® QSFP28 transceiver provides 100GBase-BX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1331nmTx/1271nmRx via an LC connector. It is guaranteed to be 100% compatible with the equivalent Arista Networks® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. 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                          | V <sub>cc</sub>  | 0    |        | 3.6                  | V    |       |
| Data Input Voltage                              |                  | -0.3 |        | 3.6                  | V    |       |
| Control Input Voltage                           |                  | -0.3 |        | 4                    | V    |       |
| Storage Temperature                             | T <sub>stg</sub> | -40  |        | 85                   | °C   |       |
| Operating Case Temperature                      | T <sub>c</sub>   | 0    |        | 70                   | °C   |       |
| Relative Humidity                               | RH               | 5    |        | 85                   | %    |       |
| Data Rate                                       | BR               |      | 53.125 |                      | GBd  |       |
| Bit Error Rate                                  | BER              |      |        | 2.4x10 <sup>-4</sup> |      | 1     |
| Supported Link Length on 9/125µm SMF, 53.125GBd | L                |      | 10     |                      | km   | 2     |

## Notes:

1. Tested with a PRBS31Q test pattern for 53.125GBd operation.
2. Distances are based on FC-PI-6 Rev. 3.1 and IEEE 802.3 standards with FEC.

## Electrical Characteristics

| Parameter                      | Symbol              | Min.  | Typ. | Max.  | Unit  | Notes |
|--------------------------------|---------------------|-------|------|-------|-------|-------|
| Power Supply Voltage           | V <sub>cc</sub>     | 3.135 | 3.3  | 3.465 | V     |       |
| Module Supply Current          | I <sub>cc</sub>     |       |      | 1212  | mA    |       |
| Power Dissipation              | P <sub>DISS</sub>   |       |      | 4000  | mW    |       |
| Transmitter                    |                     |       |      |       |       |       |
| Differential Data Input Swing  | V <sub>IN,pp</sub>  | 90    | 100  | 110   | mVp-p |       |
| Differential Input Impedance   | Z <sub>IN</sub>     | 90    | 100  | 110   | Ω     |       |
| Receiver                       |                     |       |      |       |       |       |
| Differential Data Output Swing | V <sub>OUT,pp</sub> | 300   |      | 900   | mVp-p |       |
| Differential Output Impedance  | Z <sub>OUT</sub>    | 90    | 100  | 110   | Ω     |       |

## Optical Characteristics

| Parameter                                               | Symbol      | Min.   | Typ. | Max.   | Unit  | Notes |
|---------------------------------------------------------|-------------|--------|------|--------|-------|-------|
| Transmitter                                             |             |        |      |        |       |       |
| Center Wavelength                                       | $\lambda_C$ | 1324.5 | 1331 | 1337.5 | nm    |       |
| Extinction Ratio                                        | ER          | 3.5    |      |        | dB    |       |
| Launch Optical Power (Average)                          | Pavg        | -1.4   |      | 4.5    | dBm   | 1     |
| Launch Optical Power (OMA)                              | POMA        | 0.7    |      | 4.7    | dBm   |       |
| Transmitter and Dispersion Penalty Eye Closure for PAM4 | TDECQ       |        |      | 3.4    | dB    |       |
| RIN17.1OMA (Maximum)                                    | RIN         |        |      | -136   | dB/Hz |       |
| Optical Return Loss Tolerance                           | ORLT        |        |      | 15.6   | dB    |       |
| POUT @ Tx_Disable Asserted                              | Poff        |        |      | -30    | dBm   |       |
| Receiver                                                |             |        |      |        |       |       |
| Center Wavelength                                       | $\lambda_C$ | 1264.5 | 1271 | 1277.5 | nm    |       |
| Receiver Sensitivity (OMA)                              | RxSENS      |        |      | -6.1   | dBm   | 2     |
| Receiver Overload (Pavg)                                | POL         | 4.5    |      |        | dBm   |       |
| Receiver Reflectance                                    |             |        |      | -26    | dB    |       |
| LOS De-Assert                                           | LOSD        |        |      | -12    | dBm   |       |
| LOS Assert                                              | LOSA        | -18    |      |        | dBm   |       |
| LOS Hysteresis                                          |             | 0.5    |      |        | dB    |       |

### Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Measured with PRBS31Q test pattern, 53.125GBd, and  $BER < 2.4 \times 10^{-4}$ .

## Pin Descriptions

| Pin | Logic       | Symbol  | Name/Description                      | Note |
|-----|-------------|---------|---------------------------------------|------|
| 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  | LVC MOS-I/O | SCL     | 2-Wire Serial Interface Clock.        |      |
| 12  | LVC MOS-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  | LVTTL-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    |

|    |       |      |                                      |   |
|----|-------|------|--------------------------------------|---|
| 36 | CML-I | Tx1+ | Transmitter Non-Inverted Data Input. |   |
| 37 | CML-I | Tx1- | Transmitter Inverted Data Output.    |   |
| 38 |       | 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



Block Diagram



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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