

### QSFP-100G-ER4L-I-PRO

Arista Networks® QSFP-100G-ER4L-I Compatible TAA Compliant 100GBase-ER4L QSFP28 Transceiver (SMF, 1295nm to 1309nm, 40km, -40 to 85C, LC)

#### Features

- SFF-8665 Compliance
- Single-mode Fiber
- Duplex LC Connector
- Hot Pluggable
- Metal with Lower EMI
- Industrial Temperature -40 to 85 Celsius
- RoHS Compliant and Lead Free
- Excellent ESD Protection



#### Applications:

- 100GBase Ethernet
- Access and Enterprise

#### Product Description

This Arista Networks® QSFP-100G-ER4L-I compatible QSFP28 transceiver provides 100GBase-ER4L throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm 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.

Proline'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 |
|----------------------------|--------|------|----------|------|------|
| Storage Temperature        | Tstg   | -40  |          | 85   | °C   |
| Operating Case Temperature | Tc     | -40  | 25       | 85   | °C   |
| Power Supply Voltage       | Vcc    | -0.5 |          | 4.0  | V    |
| Relative Humidity          | RH     | 5    |          | 95   | %    |
| Data Rate Per Channel      |        |      | 25.78125 |      | Gbps |

## Electrical Characteristics

| Parameter                                  | Symbol               | Min.  | Typ. | Max.  | Unit  | Notes |
|--|----------------------|-------|------|-------|-------|-------|
| Supply Voltage                             | Vcc                  | 3.135 | 3.3  | 3.465 | V     |       |
| Module Supply Current                      | Icc                  |       |      | 1350  | mA    |       |
| Power Dissipation                          | P <sub>DISS</sub>    |       |      | 4500  | mW    |       |
| <b>Transmitter</b>                         |                      |       |      |       |       |       |
| Single-Ended Input Voltage Tolerance       |                      | -0.3  |      | 4.0   | V     |       |
| Input Differential Impedance               | ZIN                  |       | 100  |       | Ω     |       |
| Differential Data Input Swing              | VIN,pp               | 190   |      | 700   | mVp-p |       |
| AC Common-Mode Input Voltage Tolerance     |                      | 15    |      |       | mVp-p |       |
| Differential Input Voltage Swing Threshold |                      |       | 50   |       | mVp-p |       |
| <b>Receiver</b>                            |                      |       |      |       |       |       |
| Single-Ended Output Voltage                |                      | -0.3  |      | 4.0   | V     |       |
| Output Differential Impedance              | ZOUT                 | 90    | 100  | 110   | Ω     |       |
| Differential Data Output Swing             | VOU <sub>T</sub> ,pp | 300   |      | 850   | mVp-p |       |
| AC Common-Mode Output Voltage              |                      |       |      | 7.5   | mVp-p |       |

## Optical Characteristics

| Parameter                          | Symbol           | Min.                               | Typ.    | Max.    | Unit | Notes |
|------------------------------------|------------------|------------------------------------|---------|---------|------|-------|
| <b>Transmitter</b>                 |                  |                                    |         |         |      |       |
| Launch Optical Power Per Lane      | Po               | -2.9                               |         | +2.9    | dBm  | 1     |
| Total Launch Optical Power         | Po               |                                    |         | +8.9    | dBm  | 1     |
| Center Wavelength Range            | L1               | 1294.53                            | 1295.56 | 1296.59 | nm   |       |
|                                    | L2               | 1299.02                            | 1300.05 | 1301.09 | nm   |       |
|                                    | L3               | 1303.54                            | 1304.58 | 1305.63 | nm   |       |
|                                    | L4               | 1308.09                            | 1309.14 | 1310.19 | nm   |       |
| Extinction Ratio                   | ER               | 8.0                                |         |         | dB   | 2     |
| Spectral Width (-20dB)             | $\Delta\lambda$  |                                    |         | 1       | nm   |       |
| Side-Mode Suppression Ratio        | SMSR             | 30                                 |         |         | dB   |       |
| Optical Return Loss Tolerance      | ORLT             |                                    |         | 20      | dB   |       |
| Pout @Tx_Disable Asserted          | Poff             |                                    |         | -30     | dBm  | 1     |
| Eye Mask: (X1, X2, X3, Y1, Y2, Y3) |                  | (0.25, 0.4, 0.45, 0.25, 0.28, 0.4) |         |         |      |       |
| <b>Receiver</b>                    |                  |                                    |         |         |      |       |
| Center Wavelength                  | L1               | 1294.53                            | 1295.56 | 1296.59 | nm   |       |
|                                    | L2               | 1299.02                            | 1300.05 | 1301.09 | nm   |       |
|                                    | L3               | 1303.54                            | 1304.58 | 1305.63 | nm   |       |
|                                    | L4               | 1308.09                            | 1309.14 | 1310.19 | nm   |       |
| Sensitivity Per Channel (OMA)      | S                |                                    |         | -16.6   | dBm  | 3     |
|                                    | S                |                                    |         | -20.5   | dBm  | 4     |
| Overload Per Channel               | P <sub>max</sub> | -4.9                               |         |         | dBm  | 3     |
| Damage Threshold Per Channel       | THd              | -3.5                               |         |         | dBm  |       |
| Receiver Reflectance               | RL               |                                    |         | -26     | dB   |       |
| LOS De-Assert                      | LOSD             |                                    |         | -21.0   | dBm  |       |
| LOS Assert                         | LOSA             | -26.0                              |         |         | dBm  |       |
| LOS Hysteresis                     | LOSH             | 0.5                                |         |         | dB   |       |

### Notes:

1. The optical power is launched into a single-mode fiber.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @25.78125Gbps.
3. Without FEC, measured with PRBS 2<sup>31</sup>-1 test pattern, 25.78125Gbps, and BER 1.0E<sup>-12</sup>.
4. With FEC, measured with PRBS 2<sup>31</sup>-1 test pattern, 25.78125Gb/s, and BER 5.0E<sup>-5</sup>.

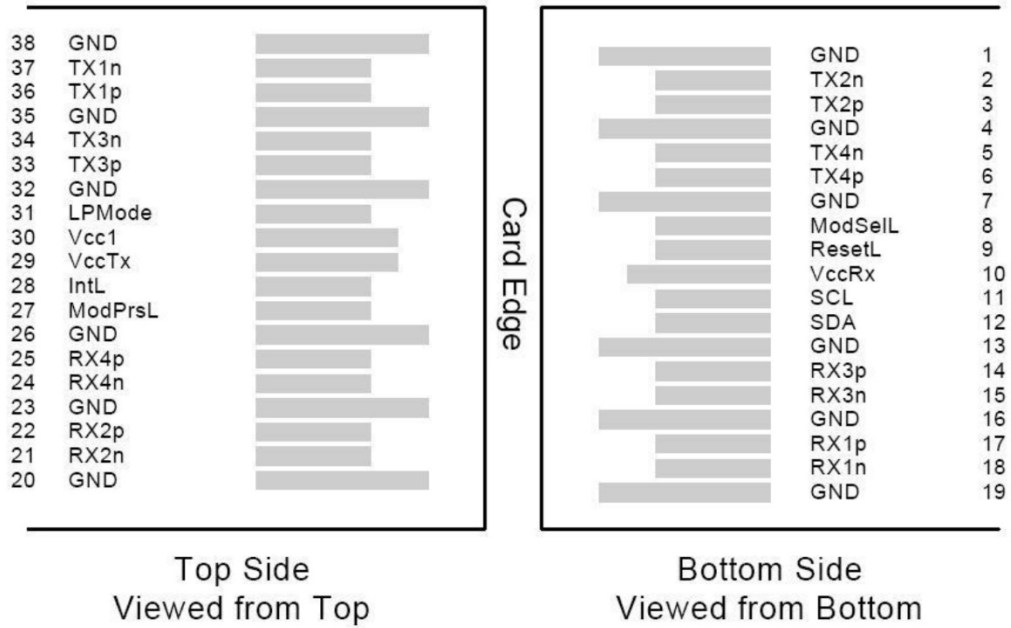
## Pin Descriptions

| Pin | Logic      | Symbol  | Name/Descriptions  | Ref. |
|-----|------------|---------|--|------|
| 1   |            | GND     | Module Ground.   | 1    |
| 2   | CML-I      | Tx2-    | Transmitter Inverted Data Input.                         |      |
| 3   | CML-I      | Tx2+    | Transmitter Non-Inverted Data Input.                     |      |
| 4   |            | GND     | Module Ground.   | 1    |
| 5   | CML-I      | Tx4-    | Transmitter Inverted Data Input.                         |      |
| 6   | CML-I      | Tx4+    | Transmitter Non-Inverted Data Input.                     |      |
| 7   |            | GND     | Module Ground.   | 1    |
| 8   | LVTTL-I    | MODSEIL | Module Select.   | 2    |
| 9   | LVTTL-I    | ResetL  | Module Reset.  | 2    |
| 10  |            | VccRx   | +3.3V Receiver Power Supply.                             |      |
| 11  | LVCMOS-I   | SCL     | 2-Wire Serial Interface Clock.                           | 2    |
| 12  | LVCMOS-I/O | SDA     | 2-Wire Serial Interface Data.                            | 2    |
| 13  |            | GND     | Module Ground.   | 1    |
| 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.                           |      |
| 25  | CML-O      | Rx4+    | Receiver Non-Inverted Data Output.                       |      |
| 26  |            | GND     | Module Ground.   | 1    |
| 27  | LVTTL-O    | ModPrsL | Module Present. Internally pulled down to GND.           |      |
| 28  | LVTTL-O    | IntL    | Interrupt output. Should be pulled up on the host board. | 2    |
| 29  |            | VccTx   | +3.3V Transmitter Power Supply.                          |      |
| 30  |            | Vcc1    | +3.3V Power Supply.                                      |      |
| 31  | LVTTL-I    | LPMoDe  | Low-Power Mode.  | 2    |
| 32  |            | GND     | Module Ground.   | 1    |
| 33  | CML-I      | Tx3+    | Transmitter Non-Inverted Data Input.                     |      |
| 34  | CML-I      | Tx3-    | Transmitter Inverted Data Input.                         |      |
| 35  |            | GND     | Module Ground.   | 1    |
| 36  | CML-I      | Tx1+    | Transmitter Non-Inverted Data Input.                     |      |
| 37  | CML-I      | Tx1-    | Transmitter Inverted Data Input.                         |      |
| 38  |            | GND     | Module Ground.   | 1    |

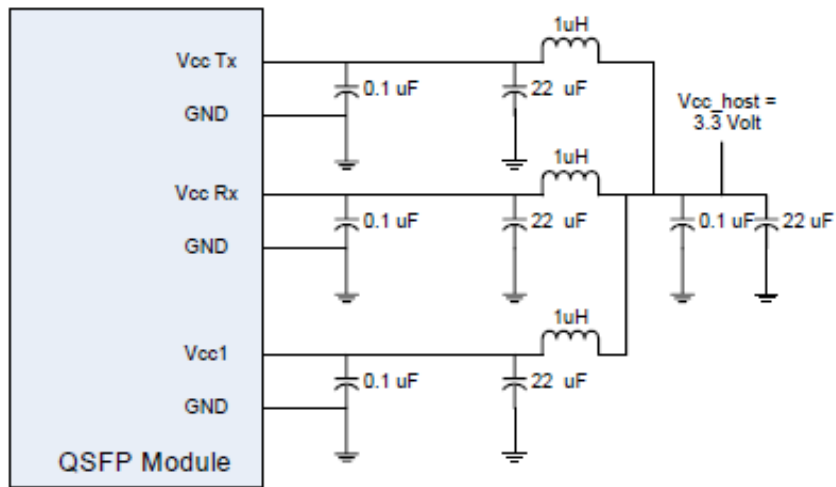
**Notes:**

1. Module circuit ground is isolated from the module chassis ground within the module.
2. Open collector. Should be pulled up with 4.7kΩ-10kΩ on the host board to a voltage between 3.15V and 3.6V.

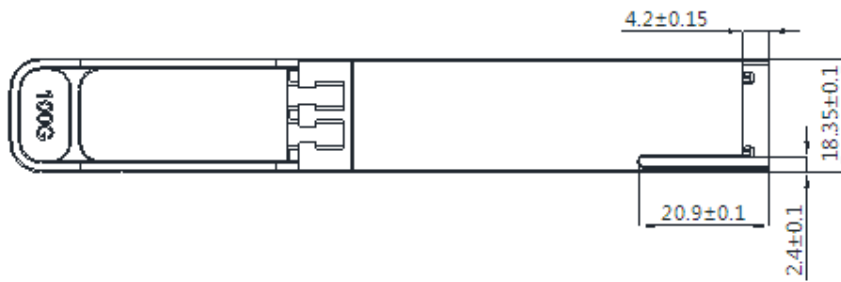
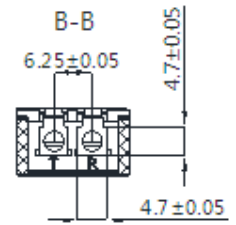
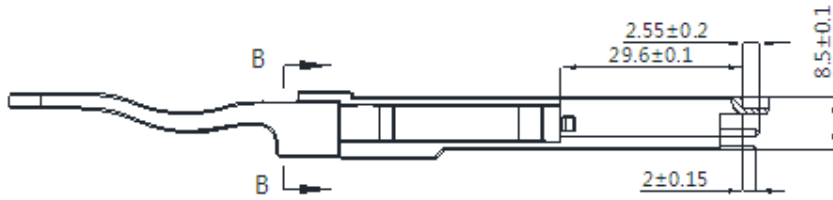
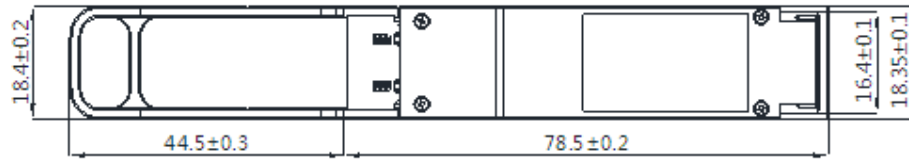
**Electrical Pin-Out Details**



**Recommended Host Board Power Supply Filter Network**



# Mechanical Specifications



**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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