**QSFP112-400GB-LR4-AR-AO**

Arista Networks® Compatible TAA 400GBase-LR4 QSFP112 Transceiver (SMF, 1310nm, 10km, LC, CMIS 5.2)

**Features**

- Compliant with 400GBASE-LR4
- Single 3.3V Power Supply
- Up to 10km over SMF with FEC
- Compliant with QSFP-DD MSA
- Duplex LC Connector
- Compliant with IEEE802ck and IEEE802cu Standards
- 4 CWDM EML and PIN Array design
- CMIS 5.2
- Operating Temperature: 0 to 70 Celsius
- Class 1 Laser
- RoHS Compliant and Lead-Free

**Applications**

- 400GBase Ethernet

**Product Description**

This Arista Networks® QSFP112 transceiver provides 400GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm 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."

## Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Storage Temperature | Tstg | -40 | | 85 | °C | |
| Operating Case Temperature | Tc | 0 | | 70 | °C | |
| Relative Humidity | RH | 5 | | 85 | % | |
| Supply Voltage | Vcc | -0.5 | | 3.6 | V | |
| Signaling Rate Per Lane | | | 53.125 ± 100ppm | | Gbd | PAM4 |
| Damage Threshold Per Lane | | 5 | | | dBm | |
| Link Distance with G.652 | D | 0.002 | | 10 | km | |
| Modulation Format | | | PAM4 | | | |

## Electrical Characteristics

| Parameter | Symbol / Test Point | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Power Supply Voltage | Vcc | 3.135 | 3.3 | 3.465 | V | |
| Power Consumption | PC | | | 10 | W | |
| Transmitter | | | | | | |
| Differential Pk-Pk Input Voltage Tolerance | TP1a | 750 | | | mV | |
| AC Common-Mode RMS Voltage Tolerance | TP1a | 25 | | | mV | |
| Single-Ended Voltage Tolerance | TP1a | -0.4 | | 3.3 | V | |
| DC Common-Mode Voltage Tolerance | TP1 | -0.35 | | 2.85 | V | |
| Receiver | | | | | | |
| AC Common-Mode Output Voltage (RMS) | TP4 | | | 25 | mV | |
| Differential Pk-Pk Output Voltage — Short-Mode | TP4 | | | 600 | mV | |
| Differential Pk-Pk Output Voltage — Long-Mode | | | | 845 | | |
| Eye Height | TP4 | 15 | | | mV | |
| DC Common-Mode Voltage Tolerance | TP4 | -0.35 | | 2.85 | V | |

## Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Transmitter | | | | | | |
| Center Wavelength | λC | 1264.5 | 1271 | 1277.5 | nm | |
| | | 1284.5 | 1291 | 1297.5 | | |
| | | 1304.5 | 1311 | 1317.5 | | |
| | | 1324.5 | 1331 | 1337.5 | | |
| Total Average Launch Power | POUT | | | 11.1 | dBm | |

| Parameter | | Symbol | | | | Unit | Note |
|---|---|---|---|---|---|---|---|
| Average Launch Power Per Lane | | P | -27 | | 5.1 | dBm | 1 |
| OMAouter Per Lane | TDECQ < 1.4dB | POMA | -0.3 | | 4.4 | dBm | |
| | 1.4dB ≤ TDECQ ≤ 3.4dB | | -1.1 + TDECQ | | 4.4 | | |
| Difference in Launch Power Between Any Two Lanes (OMAouter) | | DP | | | 4 | dB | |
| Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane | | TDECQ | | | 3.4 | dB | |
| Transmitter Eye Closure for PAM4 (TECQ) Per Lane | | TECQ | | | 3.4 | dB | |
| \| TDECQ - TECQ \| | | | | | 2.5 | dB | |
| Side-Mode Suppression Ratio | | SMSR | 30 | | | dB | |
| Extinction Ratio | | ER | 3.5 | | | dB | |
| Average Launch Power of Off Transmitter Per Lane | | Poff | | | -16 | dBm | |
| $RIN_{15.6}OMA$ | | RIN | | | -136 | dB/Hz | |
| Optical Return Loss Tolerance | | ORLT | | | 15.6 | dB | |
| Transmitter Reflectance | | TR | | | -26 | dB | 2 |
| **Receiver** | | | | | | | |
| Center Wavelength | | λC | 1264.5 | 1271 | 1277.5 | nm | |
| | | | 1284.5 | 1291 | 1297.5 | | |
| | | | 1304.5 | 1311 | 1317.5 | | |
| | | | 1324.5 | 1331 | 1337.5 | | |
| Damage Threshold Per Lane | | | 6.1 | | | dBm | 3 |
| Average Receive Power Per Lane | | | 9 | | 5.1 | dBm | 4 |
| Receive Power (OMAouter) Per Lane | | ROMA | | | 4.4 | dBm | |
| Difference in Receive Power Between Any Two Lanes (OMAouter) | | | | | 4.3 | dB | |
| Receiver Reflectance | | | | | -26 | dB | |
| Recevier Sensitivity (OMAouter) Per Lane | | SEN | Max. (-6.8, TECQ - 8.2) | | | dBm | |
| LOS Assert | | | -26 | | | dBm | |
| LOS De-Assert | | | | | -8 | dBm | |
| LOS Hysteresis | | | 0.5 | | | dBm | |

**Notes:**
1. Average launch power, per lane (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. Transmitter reflectance is defined looking into the transmitter.
3. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level.
4. Average receive power, per lane (minimum), is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

## Pin Descriptions

| Pin | Symbol | Logic | Name/Description | Plug Sequence | Notes |
|---|---|---|---|---|---|
| 1 | GND | | Module Ground. | 1 | 1 |
| 2 | Tx2- | CML-I | Transmitter Inverted Data Input. | 3 | |
| 3 | Tx2+ | CML-I | Transmitter Non-Inverted Data Input. | 3 | |
| 4 | GND | | Module Ground. | 1 | 1 |
| 5 | Tx4- | CML-I | Transmitter Inverted Data Input. | 3 | |
| 6 | Tx4+ | CML-I | Transmitter Non-Inverted Data Input. | 3 | |
| 7 | GND | | Module Ground. | 1 | 1 |
| 8 | ModSelL | LVTTL-I | Module Select. | 3 | |
| 9 | ResetL | LVTTL-I | Module Reset. | 3 | |
| 10 | VccRx | | +3.3V Receiver Power Supply. | 2 | 2 |
| 11 | SCL | LVCMOS-I/O | 2-Wire Serial Interface Clock. | 3 | |
| 12 | SDA | LVCMOS-I/O | 2-Wire Serial Interface Data. | 3 | |
| 13 | GND | | Module Ground. | 1 | 1 |
| 14 | Rx3+ | CML-O | Receiver Non-Inverted Data Output. | 3 | |
| 15 | Rx3- | CML-O | Receiver Inverted Data Output. | 3 | |
| 16 | GND | | Module Ground. | 1 | 1 |
| 17 | Rx1+ | CML-O | Receiver Non-Inverted Data Output. | 3 | |
| 18 | Rx1- | CML-O | Receiver Inverted Data Output. | 3 | |
| 19 | GND | | Module Ground. | 1 | 1 |
| 20 | GND | | Module Ground. | 1 | 1 |
| 21 | Rx2- | CML-O | Receiver Inverted Data Output. | 3 | |
| 22 | Rx2+ | CML-O | Receiver Non-Inverted Data Output. | 3 | |
| 23 | GND | | Module Ground. | 1 | 1 |
| 24 | Rx4- | CML-O | Receiver Inverted Data Output. | 3 | |
| 25 | Rx4+ | CML-O | Receiver Non-Inverted Data Output. | 3 | |
| 26 | GND | | Module Ground. | 1 | 1 |
| 27 | ModPrsL | LVTTL- O | Module Present. | 3 | |
| 28 | IntL/RxLOS | LVTTL- O | Interrupt/Optional RxLOS. | 3 | |
| 29 | VccTx | | +3.3V Transmitter Power Supply. | 2 | 2 |
| 30 | Vcc1 | | +3.3V Power Supply. | 2 | 2 |
| 31 | LPMode/TxDis | LVTTL- I | Low-Power Mode/Optional Tx_Disable. | 3 | |
| 32 | GND | | Module Ground. | 1 | 1 |
| 33 | Tx1+ | CML-I | Transmitter Non-Inverted Data Input. | 3 | |
| 34 | Tx1- | CML-I | Transmitter Inverted Data Input. | 3 | |
| 35 | GND | | Module Ground. | 1 | 1 |

| 36 | Tx1+ | CML-I | Transmitter Non-Inverted Data. | 3 | |
| 37 | Tx1- | CML-I | Transmitter Inverted Data Input. | 3 | |
| 38 | GND | | Module Ground. | 1 | 1 |

**Notes:**

1. GND is the symbol for signal and supply (power) common for the QSFP112 module. All are common within the QSFP112 module, and all 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. VccRx, Vcc1, and VccTx may be internally connected within the QSFP112 module in any combination. The connector pins are each rated for a maximum current of 1.5A (maximum current of 2.0A is required for a high module power of 15-20W).
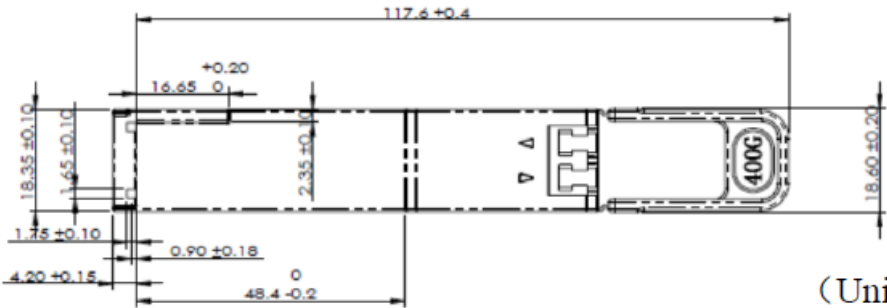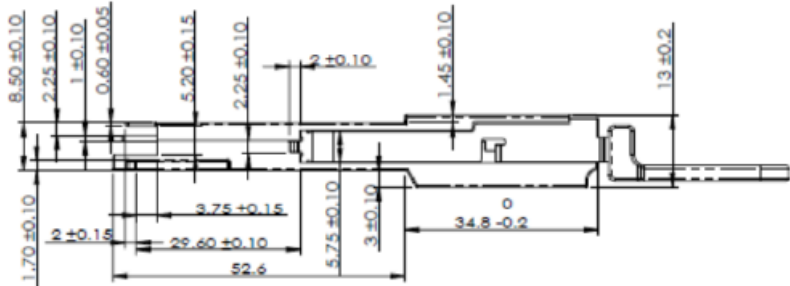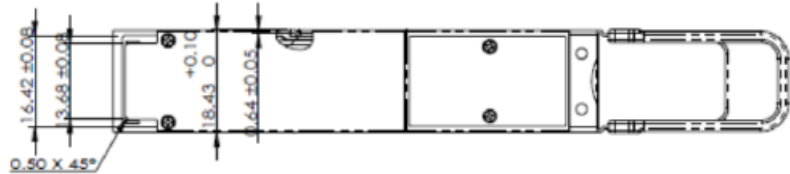
**Pin-Out Details**
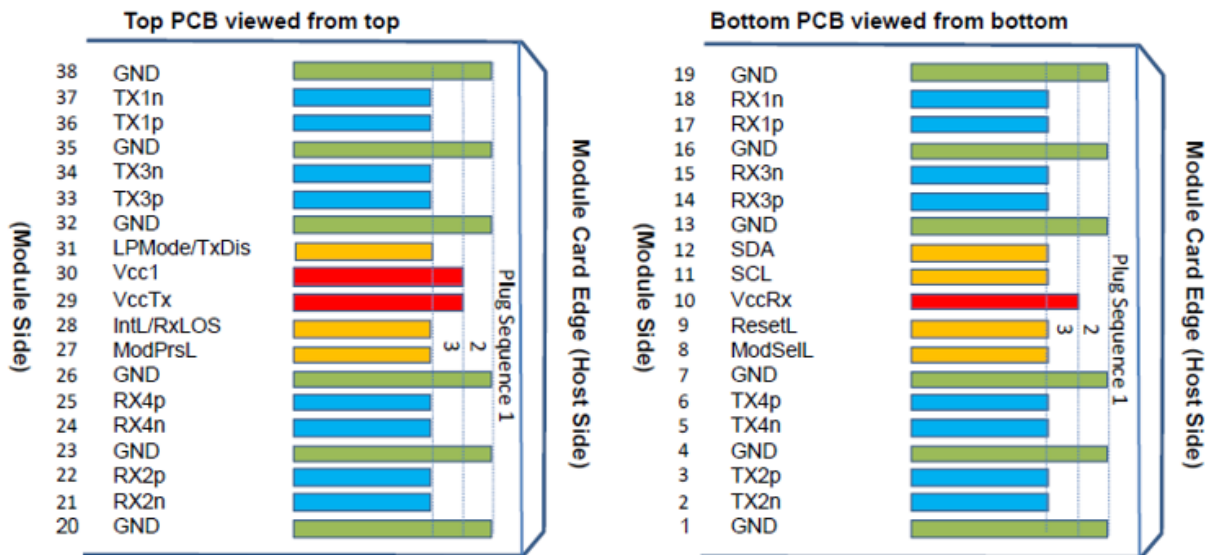
**Recommended Host Board Schematic**
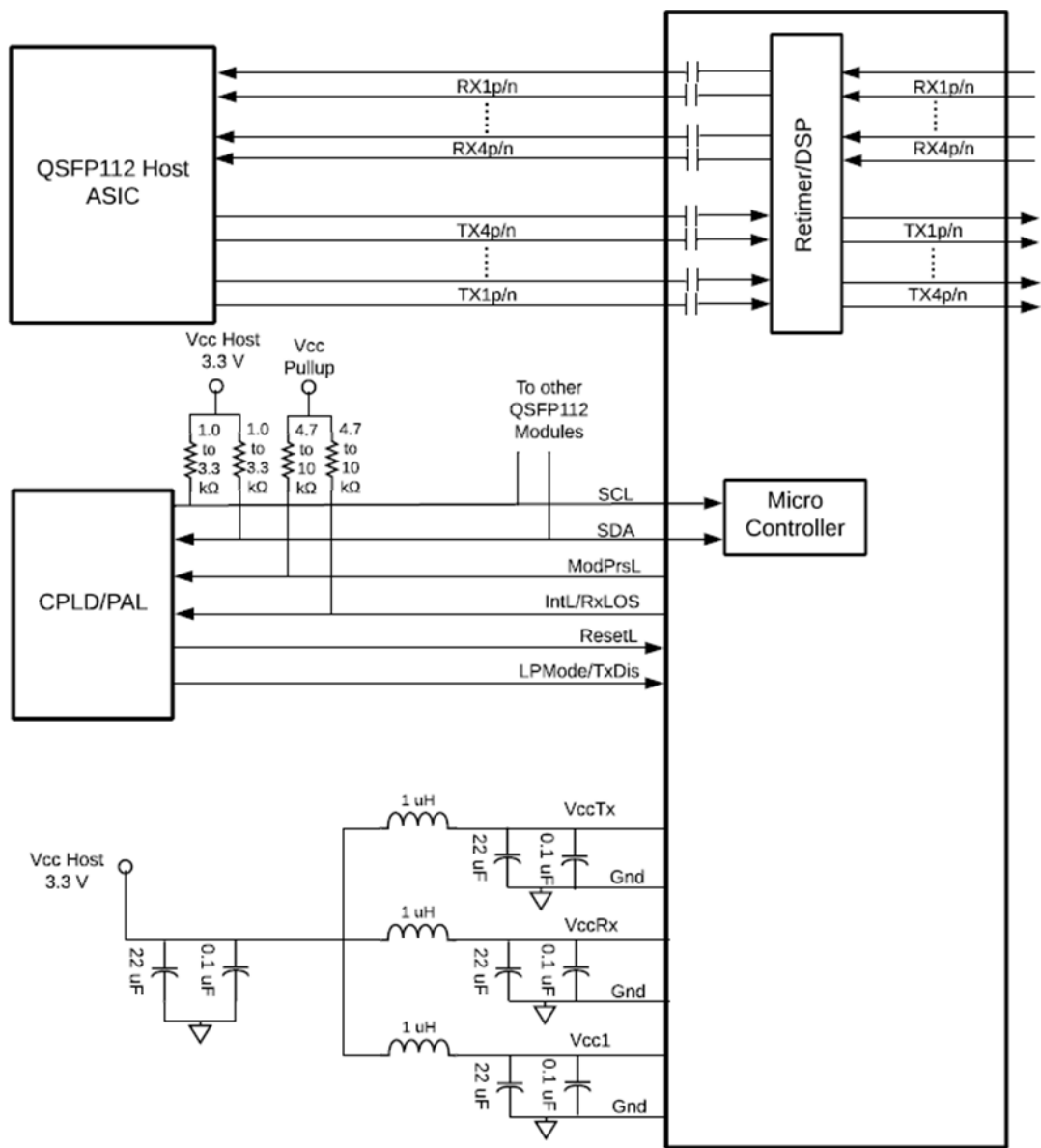
## Mechanical Specifications



（Unit: mm）

**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 in 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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