**160-9400-900-C**

Ciena® 160-9400-900 Compatible TAA 100GBase-SR4 QSFP28 Transceiver (MMF, 850nm, 100m, MPO, DOM)

**Features:**

- SFF-8665 Compliance
- MPO Connector
- Multi-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



**Applications:**

- 100GBase Ethernet
- Access and Enterprise

**Product Description**

This Ciena® 160-9400-900 compatible QSFP28 transceiver provides 100GBase-SR4 throughput up to 100m over OM4 multi-mode fiber (MMF) using a wavelength of 850nm via an MPO connector. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Ciena®. 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' 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.")

**Rev. 011926**

**Absolute Maximum Ratings**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Maximum Supply Voltage** | Vcc | -0.5 | | 4.0 | V | |
| **Storage Temperature** | $T_S$ | -40 | | +85 | °C | |
| **Relative Humidity** | RH | 5 | | 95 | % | |
| **Operating Case Temperature** | $T_C$ | 0 | 25 | 70 | °C | |
| **Data Rate PER Channel** | DR | | 25.78125 | | Gb/s | |

**Electrical Characteristics**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Supply Voltage** | $V_{CC}$ | 3.135 | 3.3 | 3.465 | V | |
| **Module Supply Current** | Icc | | | 750 | mA | |
| **Power Dissipation** | $P_D$ | | | 2.5 | W | |
| **Transmitter** | | | | | | |
| **Input Differential Impedance** | ZIN | | 100 | | Ω | |
| **Differential Data Input Swing** | $V_{IN, P-P}$ | 180 | | 900 | mVp-p | |
| **Receiver** | | | | | | |
| **Output Differential Impedance** | Zo | | 100 | | Ω | |
| **Differential Data Output Swing** | $V_{OUT, P-P}$ | 300 | | 850 | mVp-p | 1 |
| **Transition Time (20% to 80%)** | Tr,Tf | 12 | | | ps | |

**Notes:**

1. The optical power is launched into OM3 MMF.
2. Measured with a PRBS $2^{31}$-1 test pattern @25.78125Gbps.

**Optical Characteristics**

| Parameter | Symbol | Min. | Typ. | Max. | Unit. | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Launch Optical Power** | Po | -8.4 | | +2.4 | dBm | 1 |
| **Center Wavelength Range** | λc | 840 | 850 | 860 | nm | - |
| **Extinction Ratio** | EX | 2 | | | dB | 2 |
| **Spectral width (RMS)** | Δλ | | | 0.6 | nm | |
| **Transmitter and Dispersion Penalty** | TDP | | | 4.3 | dB | |
| **Optical Return Loss Tolerance** | ORLT | | | 12 | dB | |
| **Eye Diagram** | IEEE Std 802.3bm compatible | | | | | |
| **Receiver** | | | | | | |
| **Center Wavelength** | λc | 840 | 850 | 860 | nm | |
| **Average Receiver Sensitivity ($P_{avg}$)** | S | | | -11 | dBm | 3 |
| **Average Receiver Sensitivity ($P_{avg}$)** | S | | | -7.5 | dBm | 4 |
| **Receiver Overload ($P_{avg}$)** | $P_{OL}$ | 2.5 | | | dBm | |
| **Damage Threshold** | $P_{OL}$ | 3.4 | | | dBm | |
| **Optical Reflectance** | ORL | | | -12 | dB | |
| **LOS Assert** | $LOS_A$ | -30 | | | dB | |
| **LOS De-Assert** | $LOS_D$ | | | -11.5 | dB | |
| **LOS Hysteresis** | | 0.5 | | | dB | |

**Notes:**

1. The optical power is launched into OM3 MMF.
2. Measured with a PRBS $2^{31}$-1 test pattern @25.78125Gbps.
3. Measured with a PRBS $2^{31}$-1 test pattern, 25.78125Gb/s, BER<$5E^{-5}$.
4. Measured with PRBS $2^{31}$-1 test pattern, 25.78125Gb/s, BER<$10^{-12}$.

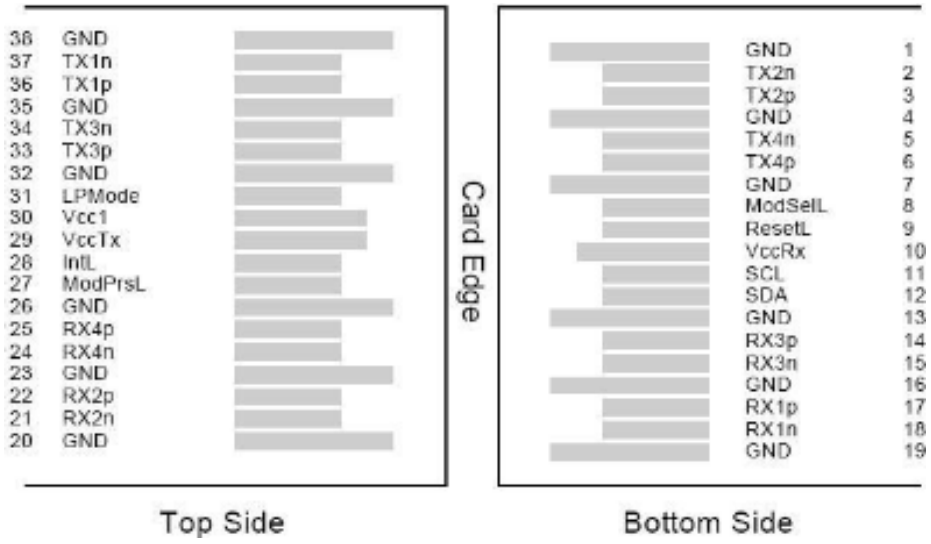
**Pin Descriptions**

| Pin | Symbol | Function/Description | Notes |
|---|---|---|---|
| **1** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **2** | Tx2- | Transmitter Inverted Data Input | |
| **3** | Tx2+ | Transmitter Non-Inverted Data output | |
| **4** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **5** | Tx4- | Transmitter Inverted Data Input | |
| **6** | Tx4+ | Transmitter Non-Inverted Data output | |
| **7** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **8** | ModSelL | Module Select | 2 |
| **9** | ResetL | Module Reset | 2 |
| **10** | VccRx | 3.3V Power Supply Receiver | |
| **11** | SCL | 2-Wire serial Interface Clock | 2 |
| **12** | SDA | 2-Wire serial Interface Data | 2 |
| **13** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **14** | Rx3+ | Receiver Non-Inverted Data Output | |
| **15** | Rx3- | Receiver Inverted Data Output | |
| **16** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **17** | Rx1+ | Receiver Non-Inverted Data Output | |
| **18** | Rx1- | Receiver Inverted Data Output | |
| **19** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **20** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **21** | Rx2- | Receiver Inverted Data Output | |
| **22** | Rx2+ | Receiver Non-Inverted Data Output | |
| **23** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **24** | Rx4- | Receiver Inverted Data Output | 1 |
| **25** | Rx4+ | Receiver Non-Inverted Data Output | |
| **26** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **27** | ModPrsl | Module Present | |
| **28** | IntL | Interrupt | 2 |
| **29** | VccTx | 3.3V power supply transmitter | |
| **30** | Vcc1 | 3.3V power supply | |
| **31** | LPMode | Low Power Mode | 2 |
| **32** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **33** | Tx3+ | Transmitter Non-Inverted Data Input | |
| **34** | Tx3- | Transmitter Inverted Data Output | |

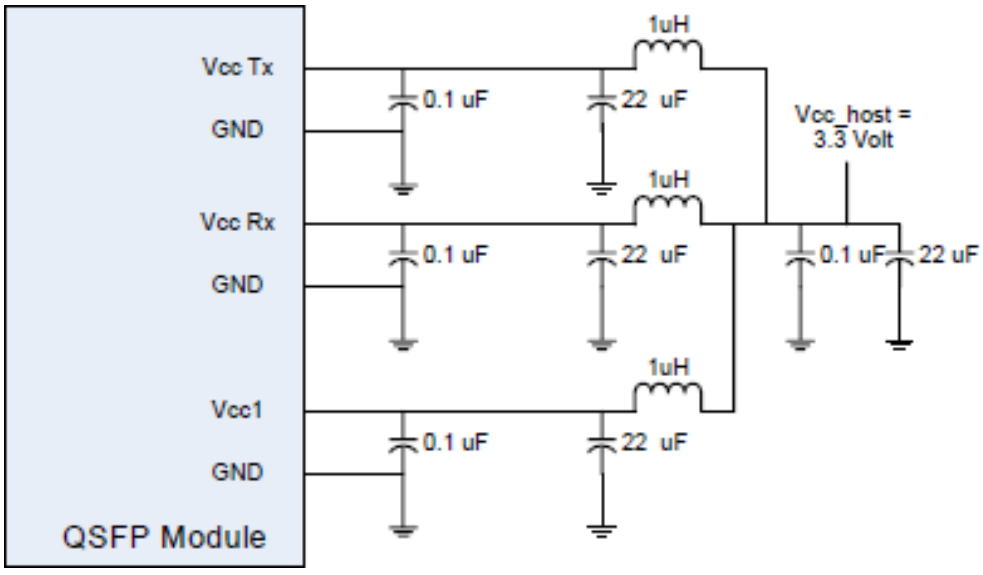
| | | | |
|---|---|---|---|
| **35** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |
| **36** | Tx1+ | Transmitter Non-Inverted Data Input | |
| **37** | Tx1- | Transmitter Inverted Data Output | |
| **38** | GND | Transmitter Ground (Common with Receiver Ground) | 1 |

**Notes:**

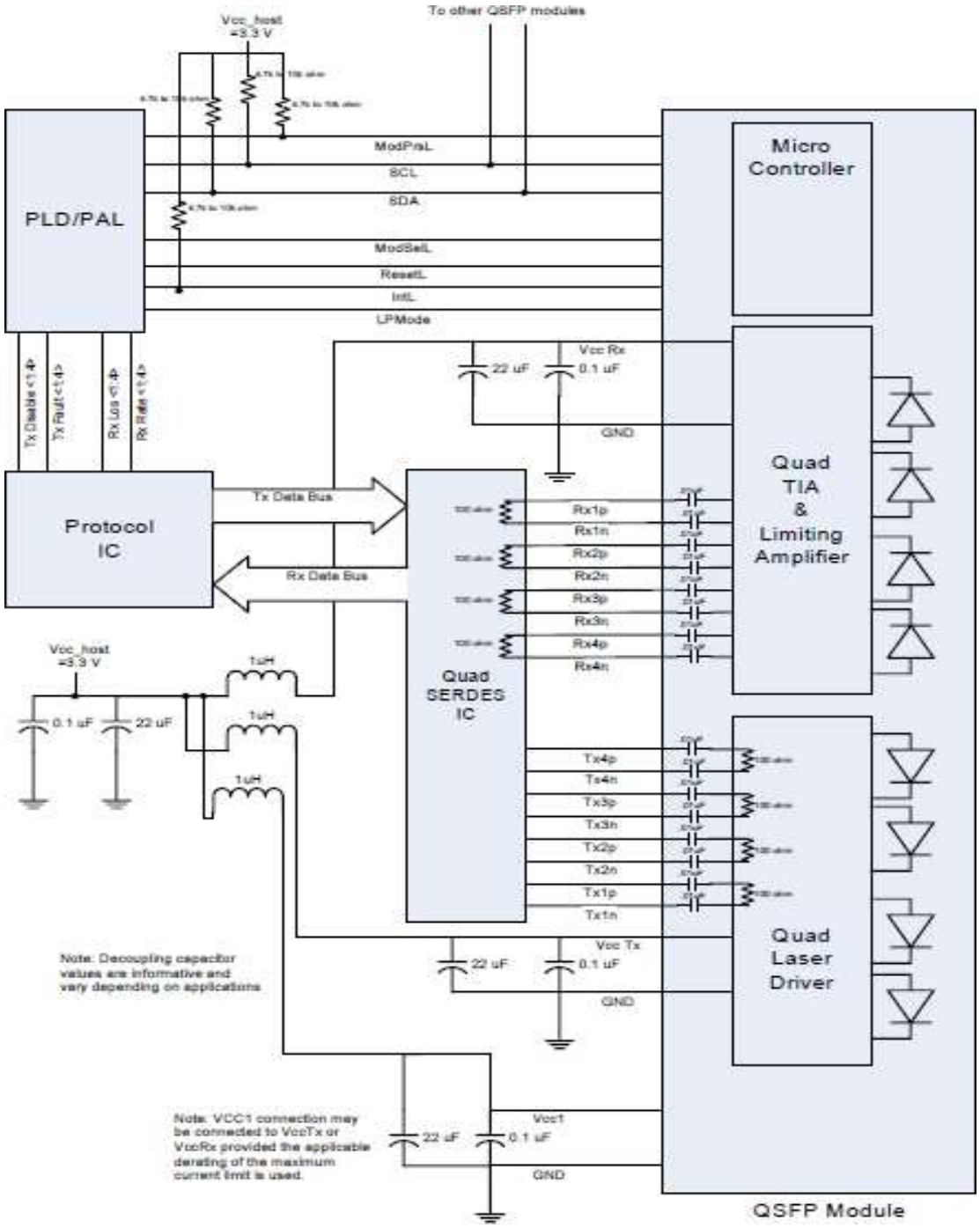
1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.



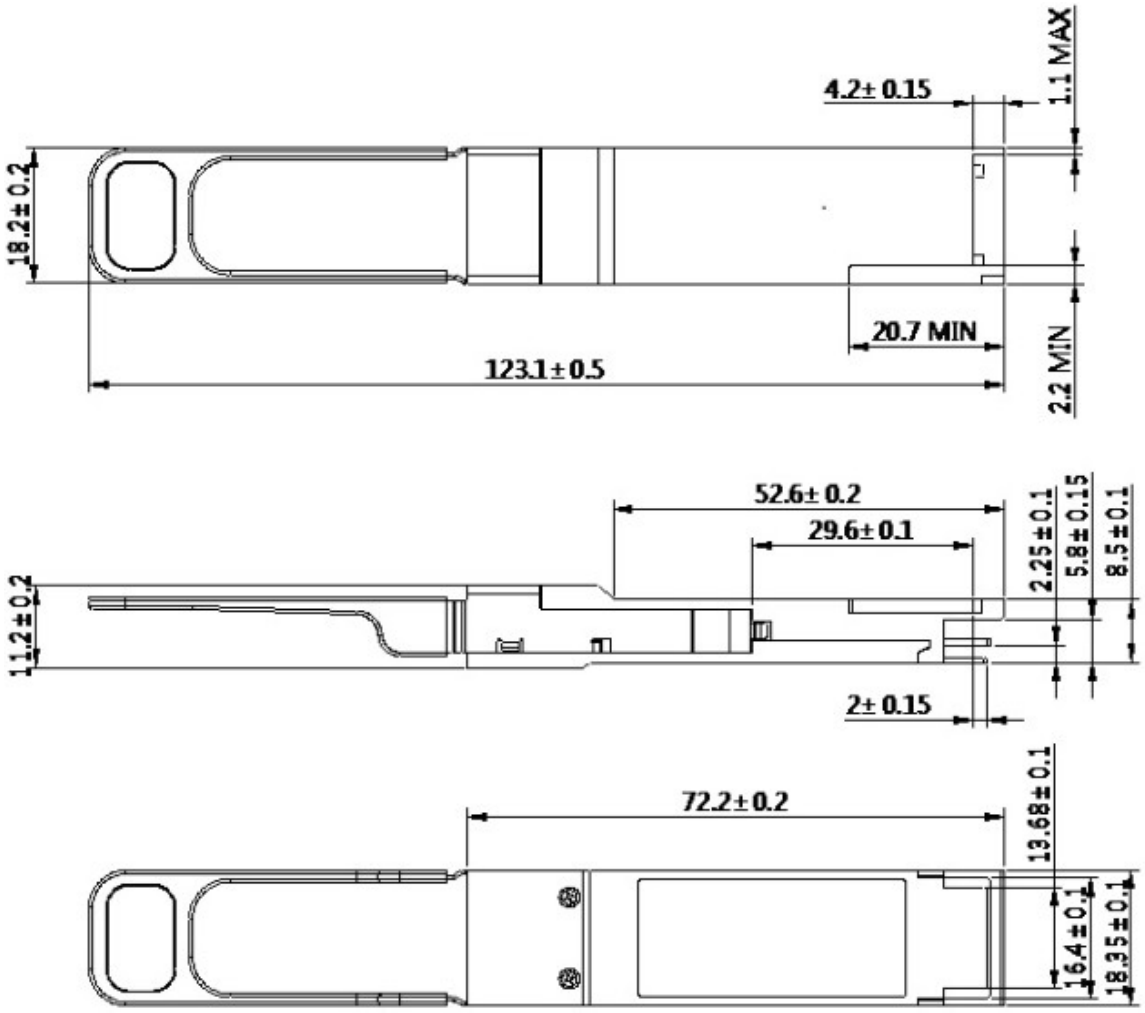

**Recommended Host Board Power Supply Filter Network**



**Recommended Application Interface Block Diagram**



**Mechanical Specifications**



**About ProLabs**

Our extensive experience comes as standard. For over 20 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with more than 100 optical switching and transport platforms.

**A Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 1.6T while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

**The Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.




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