



### **PAN-QSFP28-100GBASE-IR4-OPC**

Palo Alto Networks® PAN-QSFP28-100GBASE-IR4 Compatible TAA 100GBase-IR4 QSFP28 Transceiver (SMF, 1310nm, 2km, LC, DOM)

#### **Features**

- SFF-8665 Compliance
- Duplex LC Connector
- Single-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 Palo Alto Networks® PAN-QSFP28-100GBASE-IR4 compatible QSFP28 transceiver provides 100GBase-IR4 throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Palo Alto 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.

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

## 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 |
|----------------------------|-----------------|------|----------|------|------|
| Maximum Supply Voltage     | V <sub>CC</sub> | -0.5 |          | 4.0  | V    |
| Storage Temperature        | T <sub>S</sub>  | -40  |          | +85  | °C   |
| Operating Case Temperature | T <sub>C</sub>  | 0    | 25       | 70   | °C   |
| Relative Humidity          | RH              | 5    |          | 95   | %    |
| Data Rate PER Channel      |                 |      | 25.78125 |      | Gb/s |

## Electrical Characteristics

| Parameter                                  | Symbol                 | Min.  | Typ. | Max.  | Unit              | Notes |
|--------------------------------------------|------------------------|-------|------|-------|-------------------|-------|
| Power Supply Voltage                       | V <sub>CC</sub>        | 3.135 | 3.3  | 3.465 | V                 |       |
| Power Dissipation                          | P <sub>D</sub>         |       |      | 3500  | mW                |       |
| Module Supply Current                      | I <sub>CC</sub>        |       |      | 1100  | mA                |       |
| Transmitter                                |                        |       |      |       |                   |       |
| Single-ended Input Voltage Tolerance       | Z <sub>IN</sub>        | -0.3  |      | 4.0   | V                 |       |
| Input Differential Impedance               | V <sub>IN</sub> , P-P  |       | 100  |       | Ω                 |       |
| Differential Data Input Swing              |                        | 190   |      | 700   | mV <sub>P-P</sub> |       |
| AC Common Mode Input Voltage Tolerance     |                        | 15    |      |       | mV                |       |
| Differential Input Voltage Swing Threshold |                        | 50    |      |       | mV <sub>pp</sub>  |       |
| Receiver                                   |                        |       |      |       |                   |       |
| Single-ended Output Voltage                |                        | -0.3  |      | 4.0   | V                 |       |
| Output Differential Impedance              | Z <sub>O</sub>         | 90    | 100  | 110   | Ω                 |       |
| Differential Data Output Swing             | V <sub>OUT</sub> , P-P | 300   |      | 850   | mV <sub>P-P</sub> |       |
| AC Common Mode Output Voltage              |                        |       |      | 7.5   | mV                |       |

## Optical Characteristics

| Parameter                         | Symbol  | Min.                               | Typ. | Max.   | Unit | Notes |
|-----------------------------------|---------|------------------------------------|------|--------|------|-------|
| Transmitter                       |         |                                    |      |        |      |       |
| Launch Optical Power per lane     | Po      | -6.5                               |      | 2.5    | dBm  | 1     |
| Total Launch Optical Power        | Po      |                                    |      | +8.5   | dBm  | 1     |
| Center Wavelength Range           | L1      | 1264.5                             | 1271 | 1277.5 | nm   |       |
|                                   | L2      | 1284.5                             | 1291 | 1297.5 | nm   |       |
|                                   | L3      | 1304.5                             | 1311 | 1317.5 | nm   |       |
|                                   | L4      | 1324.5                             | 1331 | 1337.5 | nm   |       |
| Extinction Ratio                  | EX      | 4                                  |      |        | dB   | 2     |
| Spectral width (-20dB)            | Δλ      |                                    |      | 1      | nm   |       |
| Side-mode suppression ratio       | SMSR    | 30                                 |      |        | dB   |       |
| Optical Return Loss Tolerance     | ORLT    |                                    |      | 20     | dB   |       |
| Pout @TX-Disable Asserted         |         |                                    |      | -30    |      | 1     |
| Eye Mask {X1, X2, X3, Y1, Y2, Y3} |         | {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} |      |        |      |       |
| Receiver                          |         |                                    |      |        |      |       |
| Center Wavelength                 | L1      | 1264.5                             | 1271 | 1277.5 | nm   |       |
|                                   | L2      | 1284.5                             | 1291 | 1297.5 | nm   |       |
|                                   | L3      | 1304.5                             | 1311 | 1317.5 | nm   |       |
|                                   | L4      | 1324.5                             | 1331 | 1337.5 | nm   |       |
| Sensitivity per Channel           | S       |                                    |      | -11.5  | dBm  | 3     |
| Overload (each channel)           | POL     | 2.5                                |      |        | dBm  | 3     |
| Damage Threshold (each channel)   | Pdamage | 3.5                                |      |        | dBm  |       |
| Optical Return Loss               | ORL     | 26                                 |      |        | dB   |       |
| LOS Assert                        | LOSA    | -24                                |      |        | dBm  |       |
| LOS De-Assert                     | LOSD    |                                    |      | -12.0  | dBm  |       |
| LOS Hysteresis                    |         | 0.5                                |      |        | dB   |       |

### Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS  $2^{31}-1$  test pattern @25.78125Gbps.
3. Measured with PRBS  $2^{31}-1$  test pattern, 25.78125Gb/s, BER  $5.0E-5$

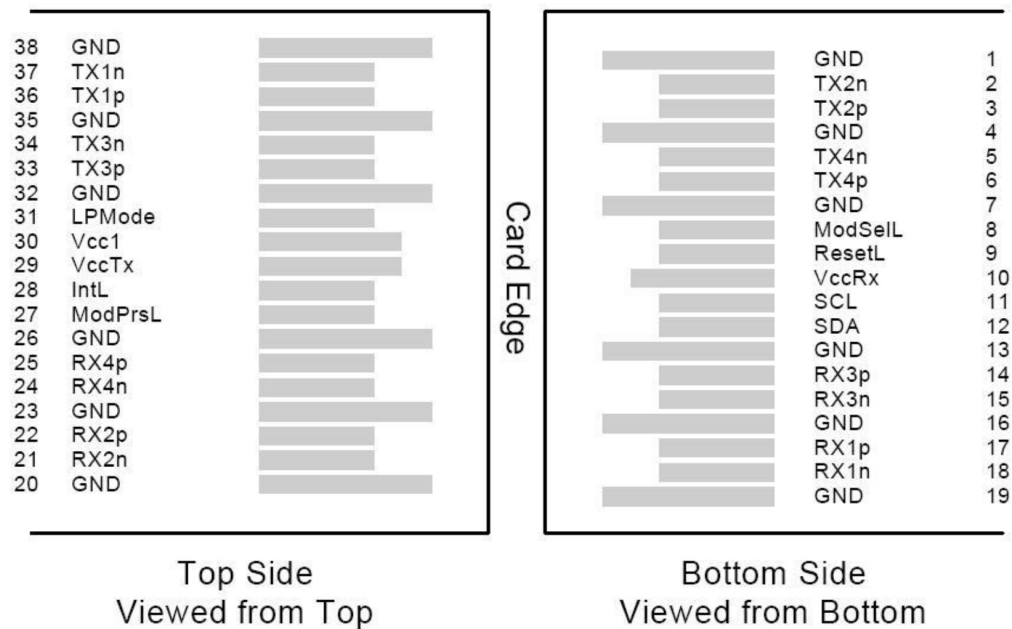
## Pin Descriptions

| Pin | Symbol  | Name/Descriptions                                | Ref. |
|-----|---------|--------------------------------------------------|------|
| 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  | ModPrsI | 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    |

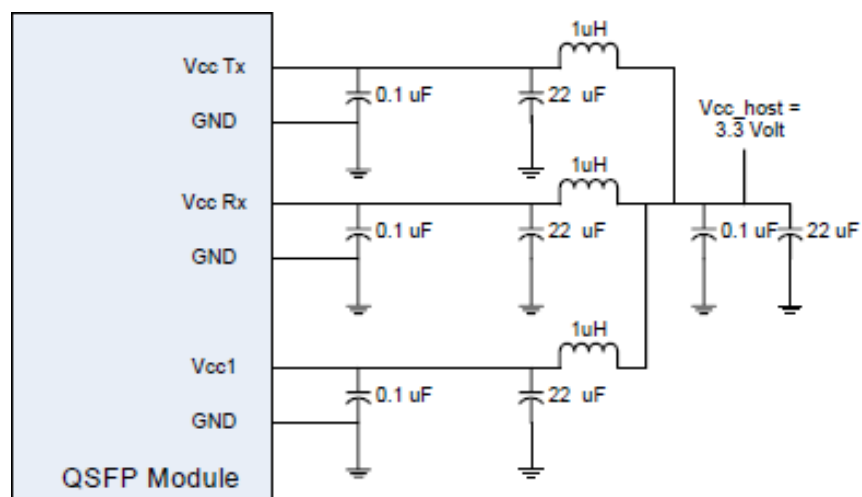
### Notes:

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.

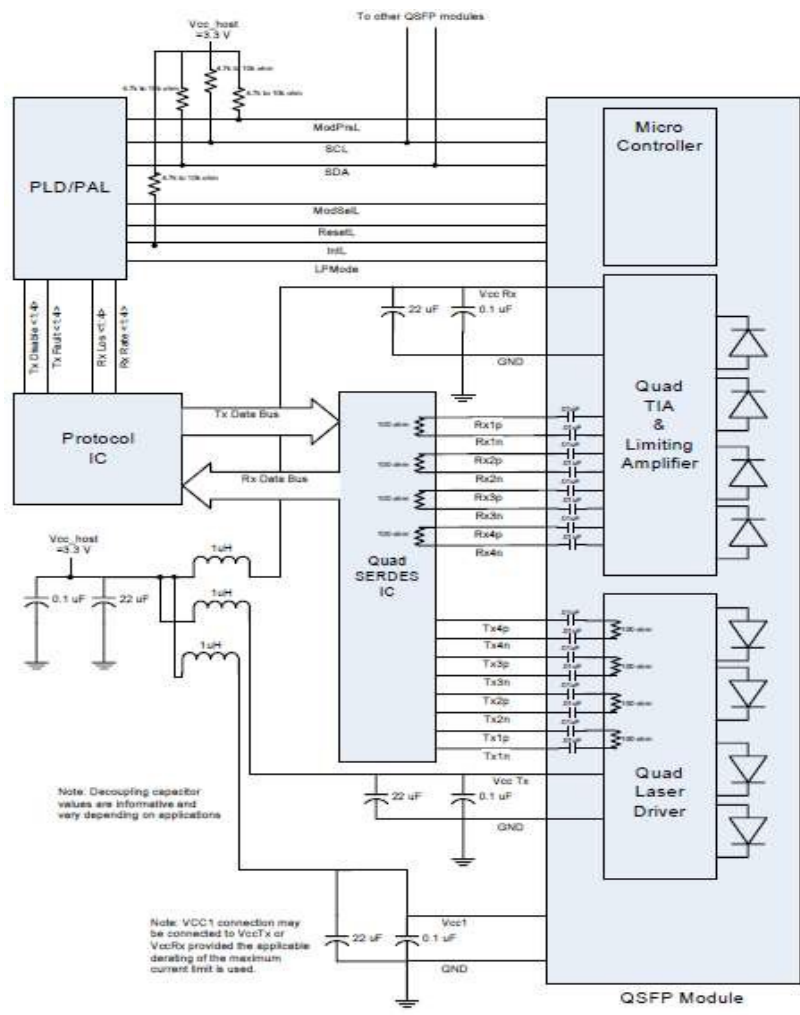
### Electrical Pin-out Details



### Recommended Host Board Power Supply Filter Network

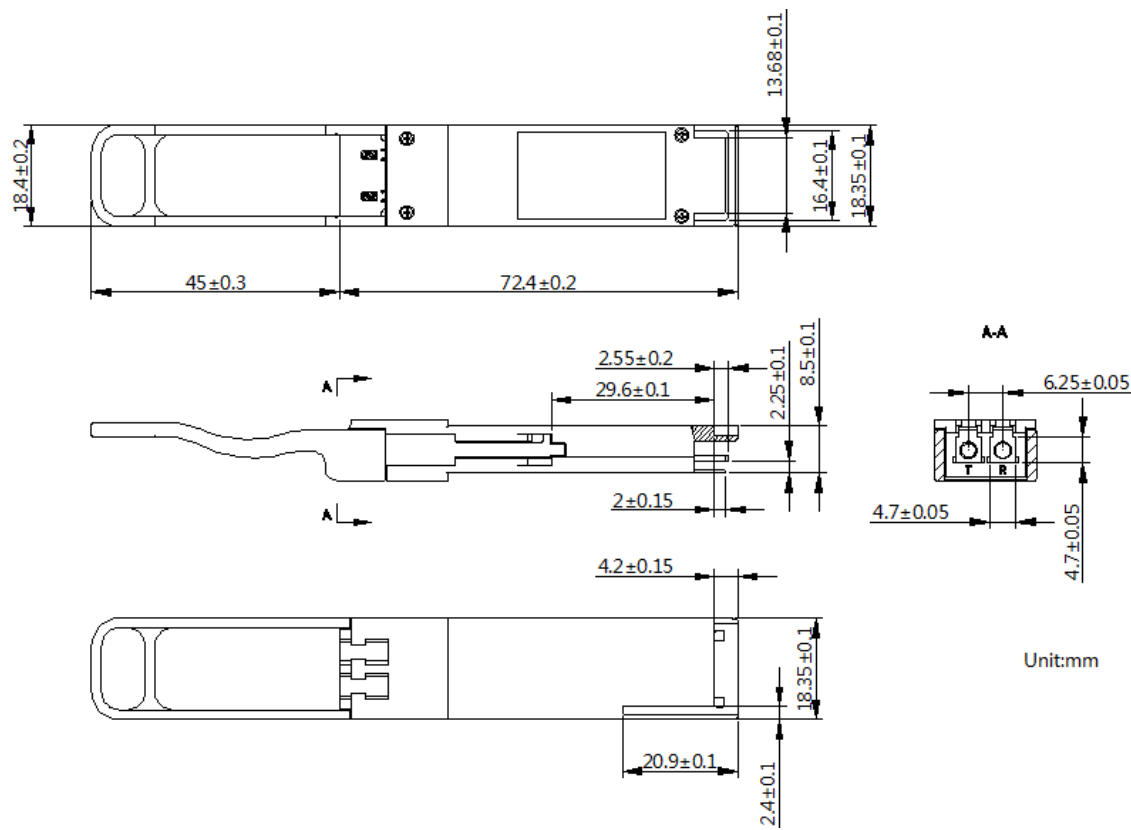


Recommended Application Interface Block Diagram



Mechanical Specifications

Measurement unit: mm



## **OptioConnect**

### **Innovation for the Future of High-Speed Networking**

#### **Who We Are**

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

#### **What We Do**

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

#### **Smarter Networks by Design**

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

#### **Our Team**

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

#### **Our Mission**

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

#### **Let's Connect**

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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