

## QSFP28-100GB-PLR4-IN-SKY

Intel® Compatible 100GBase-PLR4 QSFP28 Transceiver (SMF, 1310nm, 10km, MPO, DOM)

### Product Description

This Intel® compatible QSFP28 transceiver provides 100GBase-PLR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an MPO connector. It is guaranteed to be 100% compatible with the equivalent Intel® 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. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

### Features:

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



### Applications:

- 100GBase Ethernet
- Access and Enterprise

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### **ESD**

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### **LASER SAFETY**

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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### 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 |      | Gbps |

### Electrical Characteristics

| Parameter                              | Symbol               | Min.  | Typ. | Max.  | Unit  | Notes |
|----------------------------------------|----------------------|-------|------|-------|-------|-------|
| Power Supply Voltage                   | V <sub>CC</sub>      | 3.135 | 3.30 | 3.465 | V     |       |
| Power Supply Current                   | I <sub>CC</sub>      |       |      | 1100  | mA    |       |
| Power Dissipation                      | P <sub>D</sub>       |       |      | 3500  | mW    |       |
| Transmitter                            |                      |       |      |       |       |       |
| Differential data input swing          | V <sub>in,pp</sub>   | 190   |      | 700   | mVp-p |       |
| Input differential impedance           | Z <sub>in</sub>      | 90    | 100  | 110   | Ω     |       |
| AC Common Mode Input Voltage Tolerance |                      | 15    |      |       | mV    |       |
| Receiver                               |                      |       |      |       |       |       |
| Differential data output swing         | V <sub>out, pp</sub> | 300   |      | 850   | mV    | 1     |
| Output differential impedance          | Z <sub>in</sub>      | 90    | 100  | 110   | Ω     |       |
| AC Common Mode Output Voltage          |                      |       |      | 7.5   | mV    |       |
| Single-ended Output Voltage            |                      | -0.3  |      | 4     | V     |       |

### Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.

## Optical Characteristics

| Parameter                                                   | Symbol                        | Min. | Typ. | Max.  | Unit | Notes |
|-------------------------------------------------------------|-------------------------------|------|------|-------|------|-------|
| Transmitter                                                 |                               |      |      |       |      |       |
| Launch Optical Power Per Lane                               | P <sub>o</sub>                | -4   |      | +2    | dBm  | 1     |
| Side Mode Suppression Ratio                                 | SMSR                          | 30   |      |       | dB   |       |
| Optical Return Loss Tolerance                               | ORLT                          |      |      | 12    | dB   |       |
| Optical Extinction Ratio                                    | ER                            | 3.5  |      |       | dB   | 2     |
| Optical Wavelength                                          | Tλ                            | 1295 | 1310 | 1325  | nm   |       |
| P <sub>out</sub> @TX-Disable Asserted                       | P <sub>out</sub>              |      |      | -30   | dBm  | 1     |
| Transmitter eye mask definition<br>{X1, X2, X3, Y1, Y2, Y3} | {0.31,0.4,0.45,0.34,0.38,0.4} |      |      |       |      |       |
| Receiver                                                    |                               |      |      |       |      |       |
| Receiver wavelength                                         | Rλ                            | 1295 |      | 1325  | nm   |       |
| Receiver Sensitivity                                        | S                             |      |      | -12.0 | dBm  | 3     |
| Damage Threshold                                            | P <sub>OL</sub>               | 3.0  |      |       | dBm  |       |
| LOS De-Assert                                               | LOS <sub>D</sub>              |      |      | -12.5 | dBm  |       |
| LOS Assert                                                  | LOS <sub>A</sub>              | -24  |      |       | dBm  |       |
| LOS Hysteresis                                              |                               | 0.5  |      |       | dB   |       |

### Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @25.78125Gbps.
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 25.78125Gb/s, BER of 5×10<sup>-5</sup>(informative)

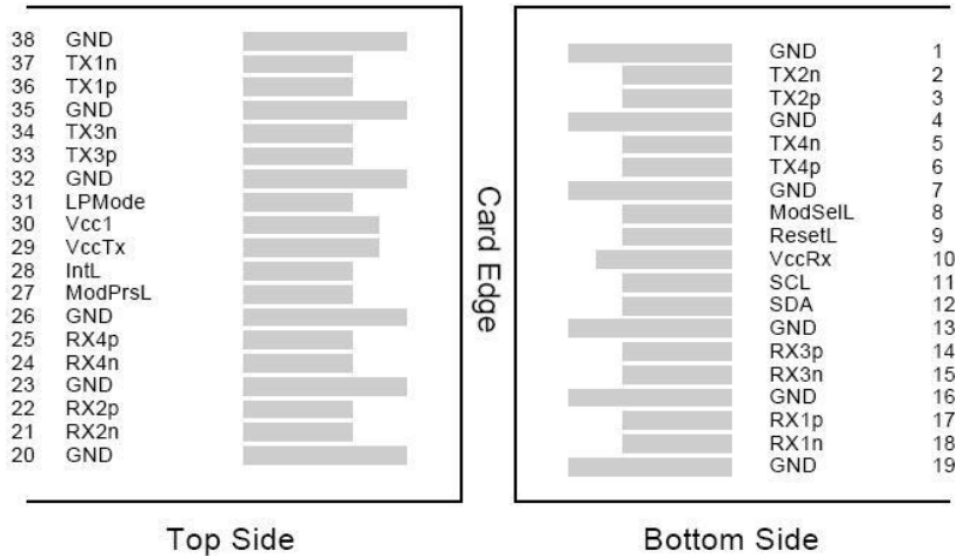
## Pin Descriptions

| 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  | 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    |

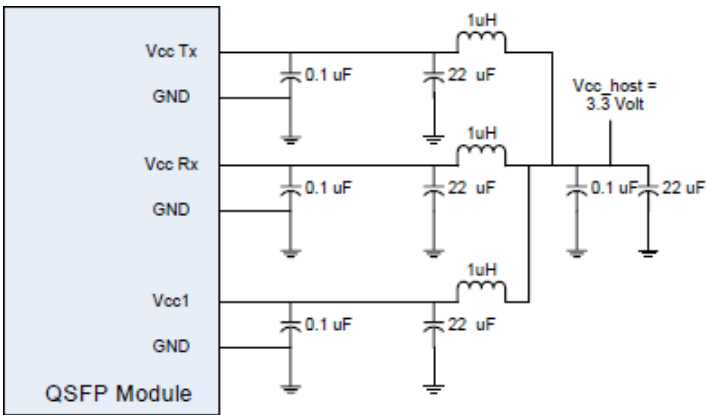
**Notes:**

- 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.

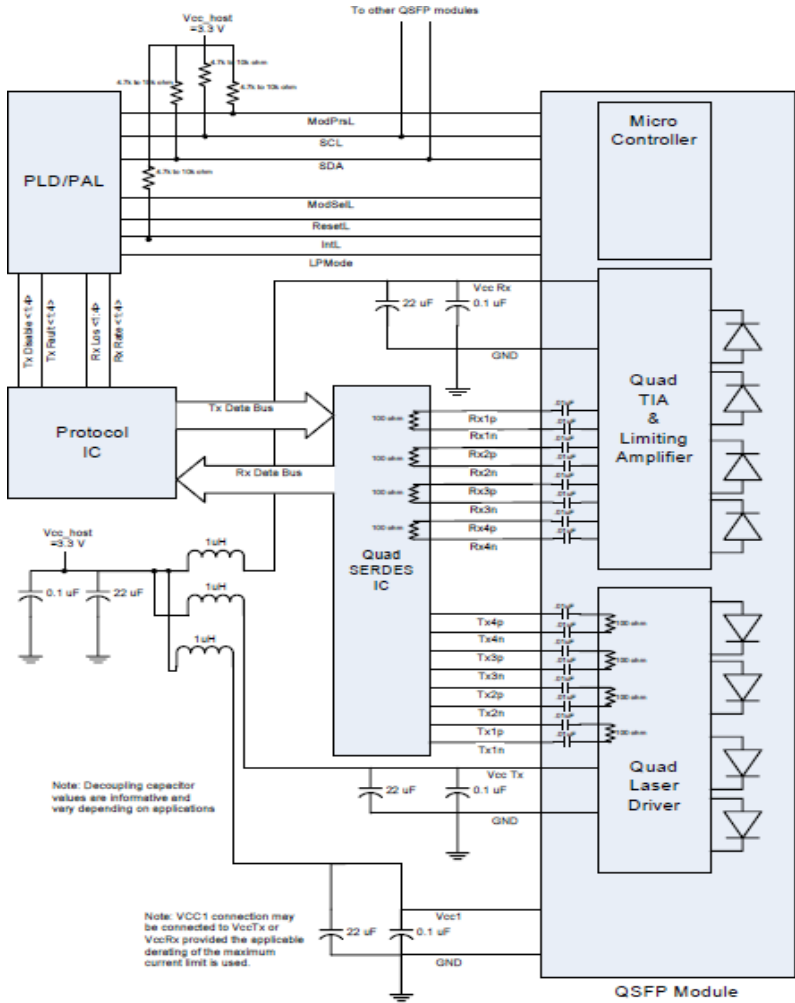
**Electrical Pin-out Details**



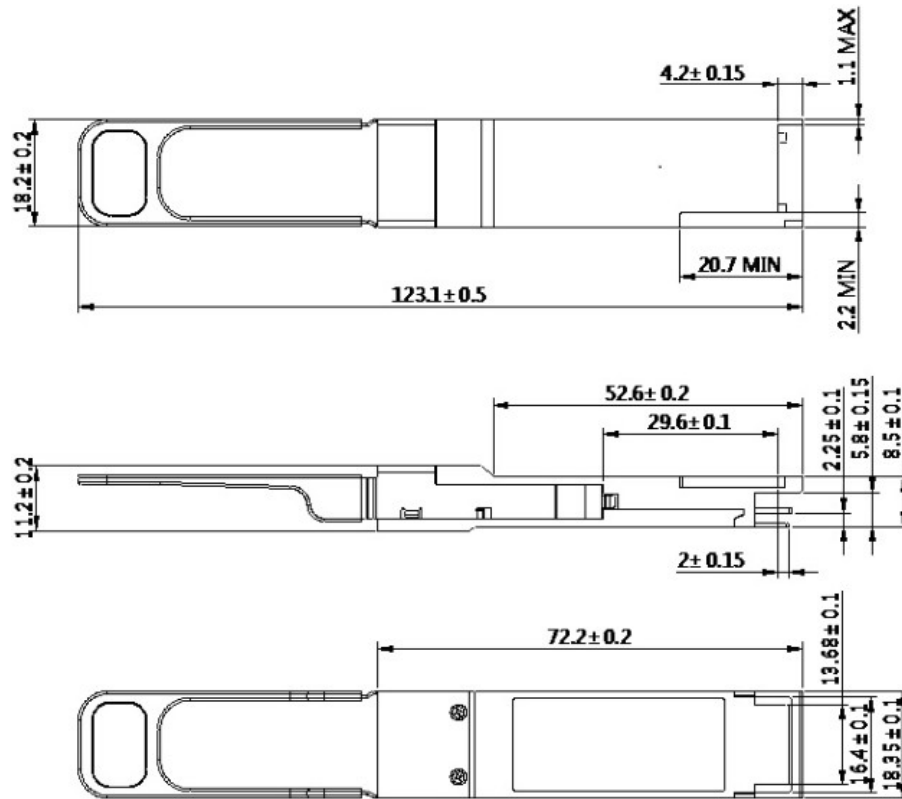
Recommended Host Board Power Supply Filter Network



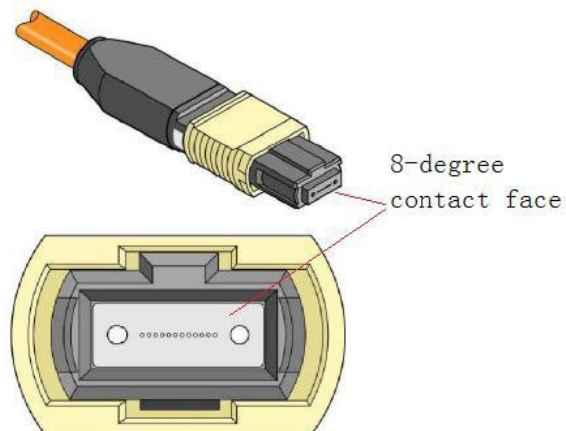
Recommended Application Interface Block Diagram



## Mechanical Specifications



**Attention:** To minimize MPO connection induced reflections, an MPO receptacle with 8-degree angled end-face is utilized for this product. A female MPO connector with 8-degree end-face should be used with this product as illustrated in below Figure.



# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

