# XCVR-Q40V03-SKY

Ciena® XCVR-Q40V03 Compatible 100GBase-ER4L QSFP28 Transceiver (SMF, 1310nm, LC, DOM, 40km, -40 to 85C)

**Product Description**

This Ciena® XCVR-Q40V03 compatible QSFP28 transceiver provides 100GBase-ER4 throughput up to 40km w/host FEC over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm via an LC connector. It can operate at temperatures between -40 and 85C. It is guaranteed to be 100% compatible with the equivalent Ciena® 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
- 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

*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.*

**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** | $P_{DISS}$ | | | 4500 | mW | |
| **Transmitter** | | | | | | |
| **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 | |
| **Receiver** | | | | | | |
| **Single-Ended Output Voltage** | | -0.3 | | 4.0 | V | |
| **Output Differential Impedance** | ZOUT | 90 | 100 | 110 | Ω | |
| **Differential Data Output Swing** | VOUT,pp | 300 | | 850 | mVp-p | |
| **AC Common-Mode Output Voltage** | | | | 7.5 | mVp-p | |

**Optical Characteristics**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **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)** | Δλ | | | 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) | | | | |
| **Receiver** | | | | | | |
| **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** | $P_{max}$ | -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 $2^{31}$-1 test pattern @25.78125Gbps.
3. Without FEC, measured with PRBS $2^{31}$-1 test pattern, 25.78125Gbps, and BER $1.0E^{-12}$.
4. With FEC, measured with PRBS $2^{31}$-1 test pattern, 25.78125Gb/s, and BER $5.0E^{-5}$.

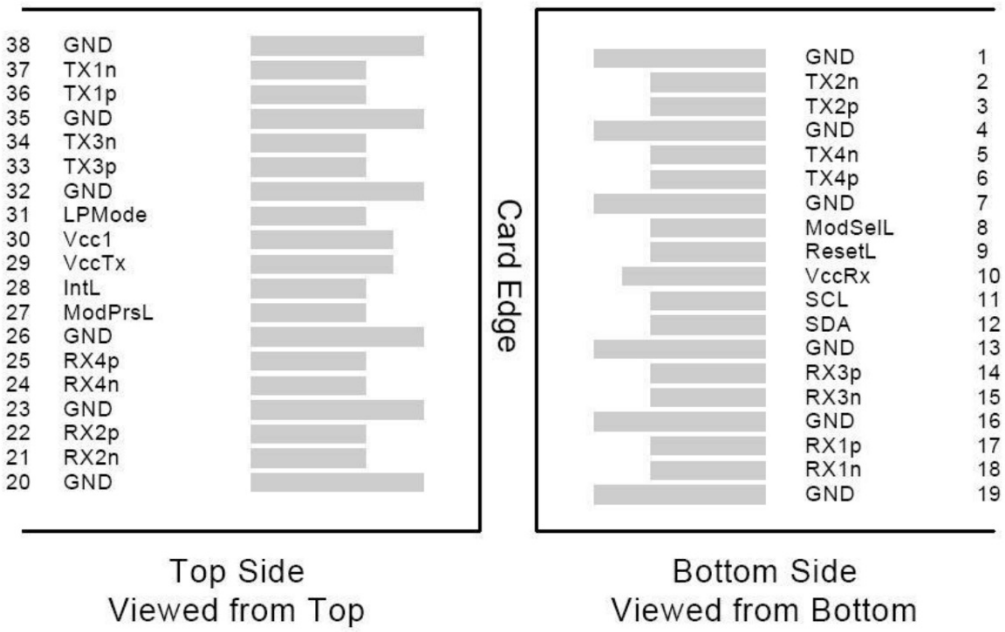
**Pin Descriptions**

| 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 |

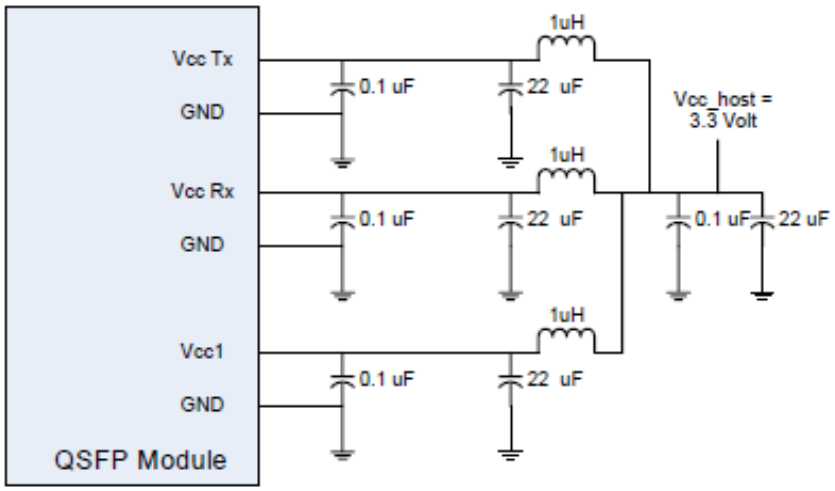
**Notes:**

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.

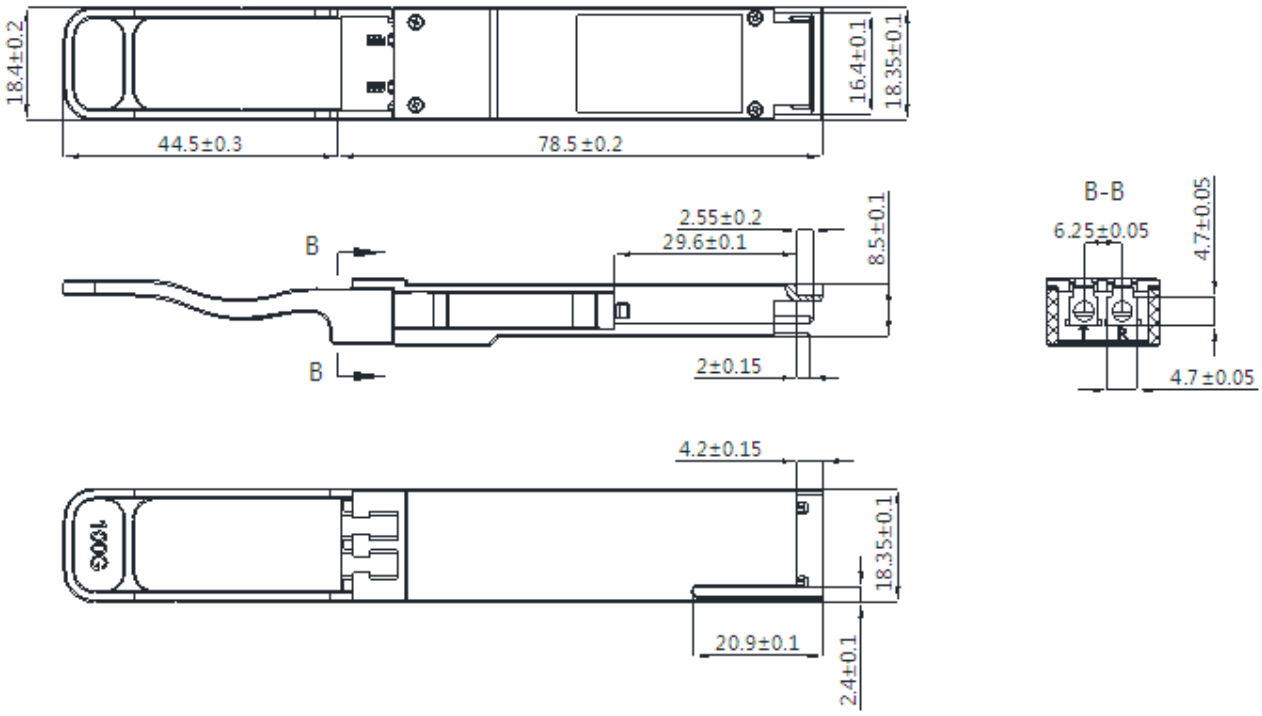
**Electrical Pin-Out Details**




**Recommended Host Board Power Supply Filter Network**



**Mechanical Specifications**



# About 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.