



## QSFP-100G-LR-S-CW29-SKY

Cisco® QSFP-100G-LR-S-CW29 Compatible 100GBase-CWDM QSFP28 Transceiver Single Lambda (SMF, 1290nm, 10km w/FEC, LC, DOM)

### Product Description

This Cisco® QSFP-100G-LR-S-CW29 compatible QSFP28 transceiver provides 100GBase-CWDM throughput up to 10km w/host FEC over single-mode fiber (SMF) using a single lambda wavelength of 1290nm via an LC connector. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Cisco®. 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. 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:

- Supports 100Gbps
- Single 3.3V Power Supply
- 100G Lambda MSA 100G-LR Specification Compliant
- Up to 10km over SMF with FEC
- QSFP28 MSA Compliant
- Power Dissipation < 4.5W
- 4x25G Electrical Interface
- SFF-8636 Rev 2.10a Compliant
- Operating Case Temperature: 0C to 70C
- LC Duplex Connector
- I2C Interface with Integrated Digital Diagnostic Monitoring
- RoHS compliant



### Applications:

- 100GBase Ethernet over CWDM
- Access, Metro 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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### CWDM Available Wavelengths

| Wavelengths | Min.   | Typ. | Max.   |
|-------------|--------|------|--------|
| 27          | 1264.5 | 1271 | 1277.5 |
| 29          | 1284.5 | 1291 | 1297.5 |
| 31          | 1304.5 | 1311 | 1317.5 |
| 33          | 1324.5 | 1331 | 1337.5 |

### Absolute Maximum Ratings

| Parameter                   | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------------|--------|------|------|------|------|
| Maximum Supply Voltage      | Vcc    | -0.5 |      | 4.0  | V    |
| Storage Temperature         | TS     | -40  |      | +85  | °C   |
| Operating Case Temperature  | Tc     | 0    |      | 70   | °C   |
| Operating Relative Humidity | RH     | 5    |      | 85   | %    |
| Damage threshold            | Rxdmg  | 5.5  |      |      | dBm  |

### Electrical Characteristics

| Parameter                              | Symbol | Min.  | Typ. | Max.  | Unit  | Notes       |
|----------------------------------------|--------|-------|------|-------|-------|-------------|
| Power Supply Voltage                   | Vcc    | 3.135 | 3.3  | 3.465 | V     |             |
| Power Dissipation                      | PD     |       |      | 4.5   | W     |             |
| Transmitter                            |        |       |      |       |       |             |
| Differential data input swing per lane |        | 900   |      |       | mVp-p |             |
| Differential input impedance           | Zin    | 90    | 100  | 110   | ohm   |             |
| DC common mode voltage (Vcm)           |        | -350  |      | 2850  | mV    |             |
| Receiver                               |        |       |      |       |       |             |
| Differential output amplitude          |        |       |      | 900   | mVp-p |             |
| Differential output impedance          | Zout   | 90    | 100  | 110   | ohm   |             |
| Output Rise/Fall Time                  | tr/tf  | 12    |      |       | ps    | 20%~80%     |
| AC Common Mode Output Voltage          |        |       |      | 7.5   | mV    |             |
| Eye width                              |        | 0.57  |      |       | UI    |             |
| Eye height differential                |        | 228   |      |       | mV    | @TP4, 1E-15 |
| DC common mode voltage (Vcm)           |        | -350  |      | 2850  | mV    | 1           |

#### Notes:

1. Vcm is generated by the host. Specification includes effects of ground offset voltage.

## Optical Characteristics

| Parameter                                        | Symbol    | Min.              | Typ.        | Max.                | Unit  | Notes |
|--------------------------------------------------|-----------|-------------------|-------------|---------------------|-------|-------|
| <b>Transmitter</b>                               |           |                   |             |                     |       |       |
| Signaling speed                                  |           |                   | 53.125      |                     | Gbaud |       |
| Modulation format                                |           | PAM4              |             |                     |       |       |
| Optical center wavelength                        | $\lambda$ | $\lambda_c - 6.5$ | $\lambda_c$ | $\lambda_c + 6.5$   | nm    |       |
| Side-mode suppression ratio                      | SMSR      | 30                |             |                     | dB    |       |
| Extinction ratio                                 | ER        | 3.5               |             |                     | dB    |       |
| Transmit OMA                                     | TxOMA     | 0.7               |             | 4.7                 | dBm   |       |
| Transmit average                                 | TxAVG     | -1.4              |             | 4.5                 | dBm   | 1     |
| Launch power in OMA <sub>outer</sub> minus TDECQ |           | -0.7              |             |                     | dBm   | 2     |
| Launch power in OMA <sub>outer</sub> minus TDECQ |           | -0.6              |             |                     | dBm   | 3     |
| Transmitter and dispersion eye closure           | TDECQ     |                   |             | 3.4                 | dB    |       |
| Optical return loss tolerance                    |           |                   |             | 15.6                | dB    | 4     |
| <b>Receiver</b>                                  |           |                   |             |                     |       |       |
| Signaling speed                                  |           |                   | 53.125      |                     | Gbaud |       |
| Damage threshold                                 |           | 5.5               |             |                     | dBm   |       |
| Receive power (OMA <sub>outer</sub> )            | RxOMA     |                   |             | 4.7                 | dBm   |       |
| Average receive power                            | RxAVG     | -7.7              |             | 4.5                 | dBm   |       |
| Receiver sensitivity (OMA <sub>outer</sub> )     | SenOMA    |                   |             | Max(-6.1, SECQ-7.5) | dBm   | 5     |
| Receiver reflectance                             |           |                   |             | -26                 | dB    |       |
| LOS assert                                       | LOSA      | -15               |             |                     | dBm   |       |
| LOS De-assert                                    | LOSD      |                   |             | -12                 | dBm   |       |
| LOS hysteresis                                   |           | 0.5               |             |                     | dB    |       |

### Notes:

1. Average launch power (min) 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. For  $ER \geq 4.5\text{dB}$
3. For  $ER < 4.5\text{dB}$
4. Transmitter reflectance is defined looking into the transmitter.
5. Sensitivity is specified at  $2.4 \times 10^{-4}$  BER.

## 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 |

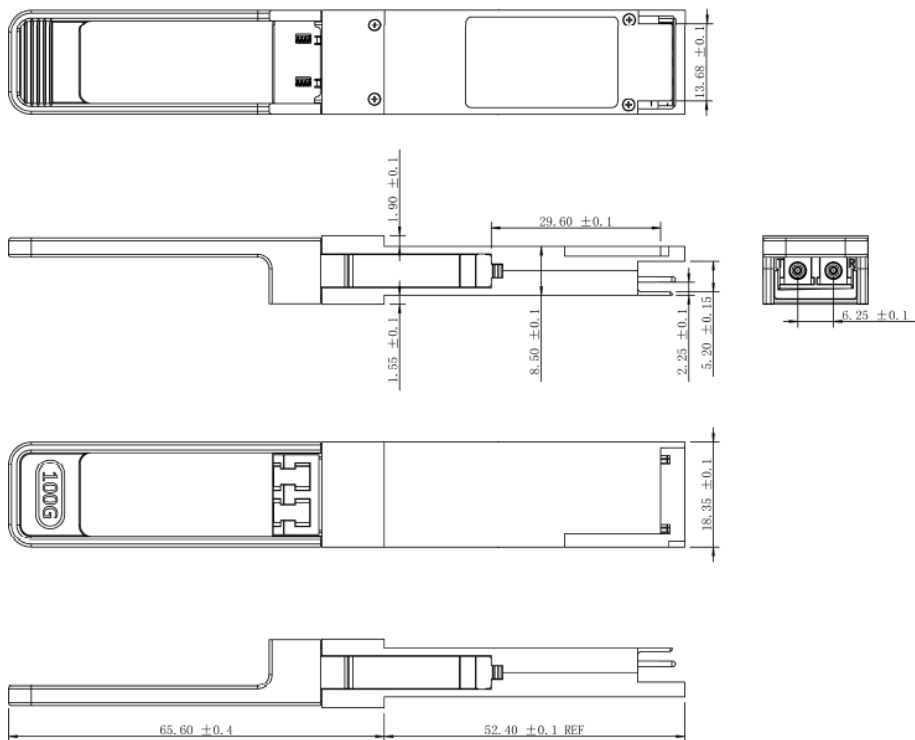
**Notes:**

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 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.

**Electrical Pin-out Details**



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.

