**QSFP-100G-ER4-S-OTU4-OPC**

Cisco® QSFP-100G-ER4-S-OTU4 Compatible TAA OTU-4-ER4 100GbE Dual-Rate QSFP28 Transceiver (SMF, 1295nm to 1309nm, 40km, 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
- OTN OTU4
- Access and Enterprise

**Product Description**

This Cisco® QSFP-100G-ER4-S-OTU4 compatible QSFP28 transceiver provides OTU-4-ER4 100GbE Dual-Rate ER4 throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® 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 | Vcc | 0 | | 3.6 | V |
| Storage Temperature | $T_s$ | -40 | | 85 | °C |
| Operating Case Temperature | $T_{op}$ | 0 | | 70 | °C |
| Relative Humidity | RH | 5 | | 85 | % |
| Damage Threshold, each lane | THd | 5.5 | | | dBm |
| Link Distance with G.652 | | | | 40 | km |

**Electrical Characteristics**

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Supply Voltage | Vcc | 3.135 | 3.3 | 3.465 | V | |
| Power dissipation | | | | 5 | W | |
| Supply Current | Icc | | | 1.4430 | A | Steady state |
| **Transmitter** | | | | | | |
| Data Rate, each lane | | | 25.78125 | | Gbps | 1 |
| | | | 27.9525 | | Gbps | 2 |
| Differential Voltage pk-pk | Vpp | | | 900 | mV | At 1 MHz |
| Common Mode Voltage | Vcm | -350 | | 2850 | mV | |
| Transition time | Trise/Tfall | 10 | | | ps | 20%~80% |
| Differential Termination Resistance Mismatch | | | | 10 | % | |
| Eye width | EW15 | 0.46 | | | UI | |
| Eye height | EH15 | 95 | | | mV | |
| **Receiver** | | | | | | |
| Data Rate, each lane | | | 25.78125 | | Gbps | 1 |
| | | | 27.9525 | | Gbps | 2 |
| Differential Termination Resistance Mismatch | | | | 10 | % | At 1 MHz |
| Differential output voltage swing | Vout, pp | | | 900 | mV | |
| Common Mode Noise, RMS | Vrms | | | 17.5 | mV | |
| Transition time | Trise/Tfall | 12 | | | ps | 20%~80% |
| Eye width | EW15 | 0.57 | | | UI | |
| Eye height | EH15 | 228 | | | mV | |

**Notes:**

1. For use of 100GBASE-ER4.
2. For use of OTU4.

**Optical Characteristics**

**100GBASE-ER4 Operation** (EOL, TOP = 0 to +70 ℃ , VCC = 3.135 to 3.465 Volts)

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Signaling Speed per Lane** | | 25.78125 ± 100 ppm | | | Gb/s | |
| **Transmit wavelengths** | L1 | 1294.53 | | 1296.59 | nm | |
| | L2 | 1299.02 | | 1301.09 | nm | |
| | L3 | 1303.54 | | 1305.63 | nm | |
| | L4 | 1308.09 | | 1310.19 | nm | |
| **Total Average Launch Power** | Po | | | 8.9 | dBm | |
| **Average launch power, each lane** | Po | -2.9 | | 2.9 | dBm | |
| **Optical Modulation Amplitude (OMA), each lane** | OMA | 0.1 | | 4.5 | dBm | |
| **Difference in launch power between any two lanes(Average and OMA)** | | | | 3.6 | dB | |
| **Transmitter and Dispersion Penalty (TDP), each lane** | TDP | | | 2.5 | dB | |
| **Extinction Ratio** | ER | 8 | | | dB | |
| **RIN$_{20}$OMA** | | | | -130 | dB/Hz | |
| **Side Mode Suppression Ratio** | SMSR | 30 | | | dB | |
| **Optical Return Loss Tolerance** | ORLT | | | 20 | dB | |
| **Transmitter reflectance** | | | | -12 | dB | |
| **Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}** | | {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} | | | | 1 |
| **Mask margin** | | 5 | | | % | 1 |
| **Receiver** | | | | | | |
| **Signaling Speed per Lane** | | 25.78125 ±100 ppm | | | Gb/s | |
| **Receive wavelengths** | L1 | 1294.53 | | 1296.59 | nm | |
| | L2 | 1299.02 | | 1301.09 | nm | |
| | L3 | 1303.54 | | 1305.63 | nm | |
| | L4 | 1308.09 | | 1310.19 | nm | |
| **Damage threshold, each lane** | Pdamage | 5.5 | | | dBm | |
| **Average receiver power, each lane** | | -20.9 | | -3.5 | dBm | |
| **Receiver power, each lane(OMA)** | | | | -3.5 | dBm | |
| **Receiver Reflectance** | Rf | | | -26 | dB | |
| **Receiver sensitivity (AOP), each lane** | S | | | -20.9 | dBm | 2 |
| **Receiver 3 dB electrical upper cutoff frequency, each lane** | | | | 31 | GHz | |
| **LOS Assert** | LOSA | -33 | | | dBm | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **LOS Deassert** | LOSD | | | -22 | dBm | |
| **LOS Hysteresis** | LOSH | 0.5 | | | dB | |

**Notes:**

1. Hit ratio $5 \times 10^{-5}$.
2. Sensitivity is specified at BER@1E-12 without FEC.

## Optical Characteristics

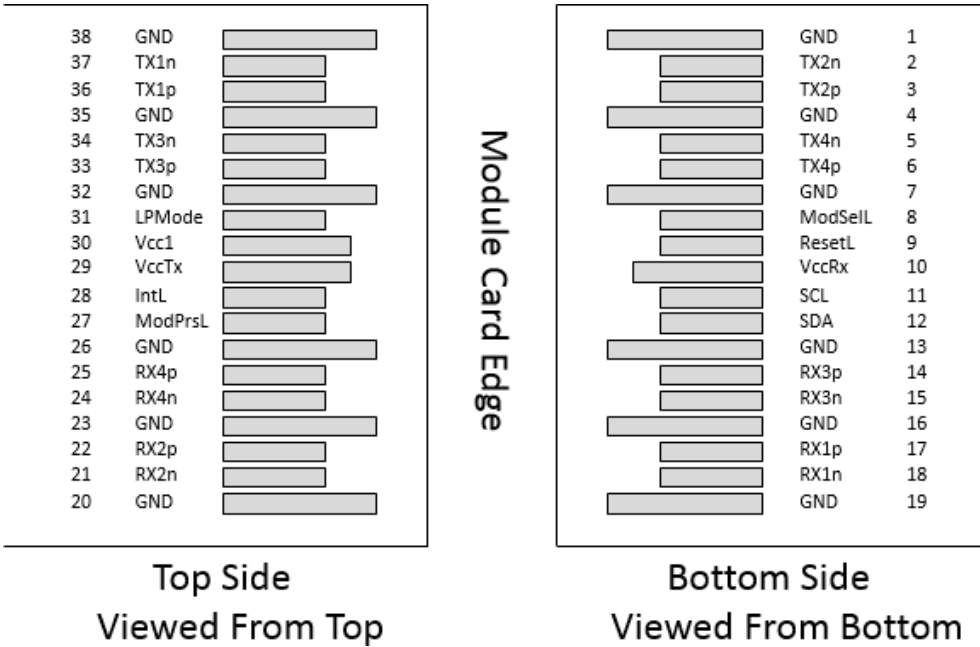**OTU4 Operation** (EOL, TOP = 0 to +70 ℃ , VCC = 3.135 to 3.465 Volts)

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Signaling Speed per Lane** | | 27.9525 ± 20 ppm | | | Gb/s | |
| **Transmit wavelengths** | L1 | 1294.53 | | 1296.59 | nm | |
| | L2 | 1299.02 | | 1301.09 | nm | |
| | L3 | 1303.54 | | 1305.63 | nm | |
| | L4 | 1308.09 | | 1310.19 | nm | |
| **Total Average Launch Power** | Po | | | 8.9 | dBm | |
| **Average launch power, each lane** | Po | -2.7 | | 2.9 | dBm | |
| **Difference in launch power between any two lanes (Average and OMA)** | | | | 3.6 | dB | |
| **Extinction Ratio** | ER | 8 | | | dB | |
| **Optical Return Loss Tolerance** | ORLT | | | 20 | dB | |
| **Transmitter reflectance** | | | | -26 | dB | |
| **Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}** | | {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} | | | | 1 |
| **Mask margin** | | 5 | | | % | 1 |
| **Receiver** | | | | | | |
| **Signaling Speed per Lane** | | 27.9525 ± 20 ppm | | | Gb/s | |
| **Receive wavelengths** | L1 | 1294.53 | | 1296.59 | nm | |
| | L2 | 1299.02 | | 1301.09 | nm | |
| | L3 | 1303.54 | | 1305.63 | nm | |
| | L4 | 1308.09 | | 1310.19 | nm | |
| **Average receiver power, each lane** | | -20.7 | | -3.5 | dBm | |
| **Receiver power, each lane(OMA)** | | | | -3.5 | dBm | |
| **Difference in receive power between any two lanes (Average and OMA)** | | | | 4.5 | | |
| **Receiver Reflectance** | Rf | | | -26 | dB | |
| **Receiver sensitivity (AOP), each lane** | S | | | -23.2 | dBm | 2 |

| | | | | 31 | GHz | |
|---|---|---|---|---|---|---|
| Receiver 3 dB electrical upper cutoff frequency, each lane | | | | 31 | GHz | |
| LOS Assert | LOSA | -33 | | | dBm | |
| LOS Deassert | LOSD | | | -24 | dBm | |
| LOS Hysteresis | LOSH | 0.5 | | | dB | |

Notes:

1. Hit ratio $5 \times 10^{-5}$.

2. Sensitivity is specified at BER@5E-5 with FEC.

**Electrical Pin-out Details**

| 38 | GND |
|---|---|
| 37 | TX1n |
| 36 | TX1p |
| 35 | GND |
| 34 | TX3n |
| 33 | TX3p |
| 32 | GND |
| 31 | LPMode |
| 30 | Vcc1 |
| 29 | VccTx |
| 28 | IntL |
| 27 | ModPrsL |
| 26 | GND |
| 25 | RX4p |
| 24 | RX4n |
| 23 | GND |
| 22 | RX2p |
| 21 | RX2n |
| 20 | GND |

Top Side
Viewed From Top

Module Card Edge

| GND | 1 |
|---|---|
| TX2n | 2 |
| TX2p | 3 |
| GND | 4 |
| TX4n | 5 |
| TX4p | 6 |
| GND | 7 |
| ModSelL | 8 |
| ResetL | 9 |
| VccRx | 10 |
| SCL | 11 |
| SDA | 12 |
| GND | 13 |
| RX3p | 14 |
| RX3n | 15 |
| GND | 16 |
| RX1p | 17 |
| RX1n | 18 |
| GND | 19 |

Bottom Side
Viewed From Bottom

**Pin Descriptions**

| Pin | Symbol | Name/Descriptions | Ref. |
|---|---|---|---|
| 1 | GND | Ground | 1 |
| 2 | Tx2n | Transmitter Inverted Data Input | |
| 3 | Tx2p | Transmitter Non-Inverted Data Input | |
| 4 | GND | Ground | 1 |
| 5 | Tx4n | Transmitter Inverted Data Input | |
| 6 | Tx4p | Transmitter Non-Inverted Data Input | |
| 7 | GND | Ground | 1 |
| 8 | ModSelL | Module Select | |
| 9 | ResetL | Module Reset | |
| 10 | Vcc Rx | +3.3V Power Supply Receiver | |
| 11 | SCL | 2-wire serial interface clock | |
| 12 | SDA | 2-wire serial interface data | |
| 13 | GND | Ground | 1 |
| 14 | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | Rx3n | Receiver Inverted Data Output | |
| 16 | GND | Ground | 1 |
| 17 | Rx1p | Receiver Non-Inverted Data Output | |
| 18 | Rx1n | Receiver Inverted Data Output | |
| 19 | GND | Ground | 1 |
| 20 | GND | Ground | 1 |
| 21 | Rx2n | Receiver Inverted Data Output | |
| 22 | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | GND | Ground | 1 |
| 24 | Rx4n | Receiver Non-Inverted Data Output | |
| 25 | Rx4p | Receiver Inverted Data Output | |
| 26 | GND | Ground | 1 |
| 27 | ModPrsL | Module Present | |
| 28 | IntL | Interrupt | |
| 29 | Vcc Tx | +3.3V Power supply transmitter | |
| 30 | Vcc1 | +3.3V Power supply | |
| 31 | LPMode | Low Power Mode | |
| 32 | GND | Ground | 1 |
| 33 | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | Tx3n | Transmitter Inverted Data Input | |
| 35 | GND | Ground | 1 |
| 36 | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | Tx1n | Transmitter Inverted Data Input | |
| 38 | GND | Ground | 1 |

**Notes:**

1. Circuit ground is internally isolated from chassis ground.

**Recommended Host Board Power Supply Filter Network**
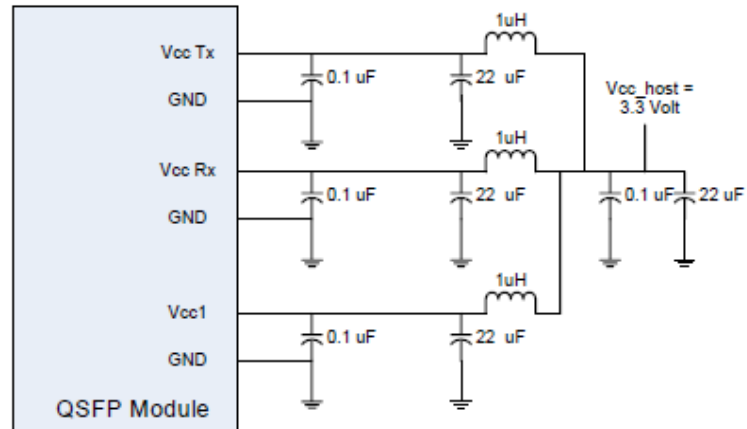


**Transceiver Block Diagram**
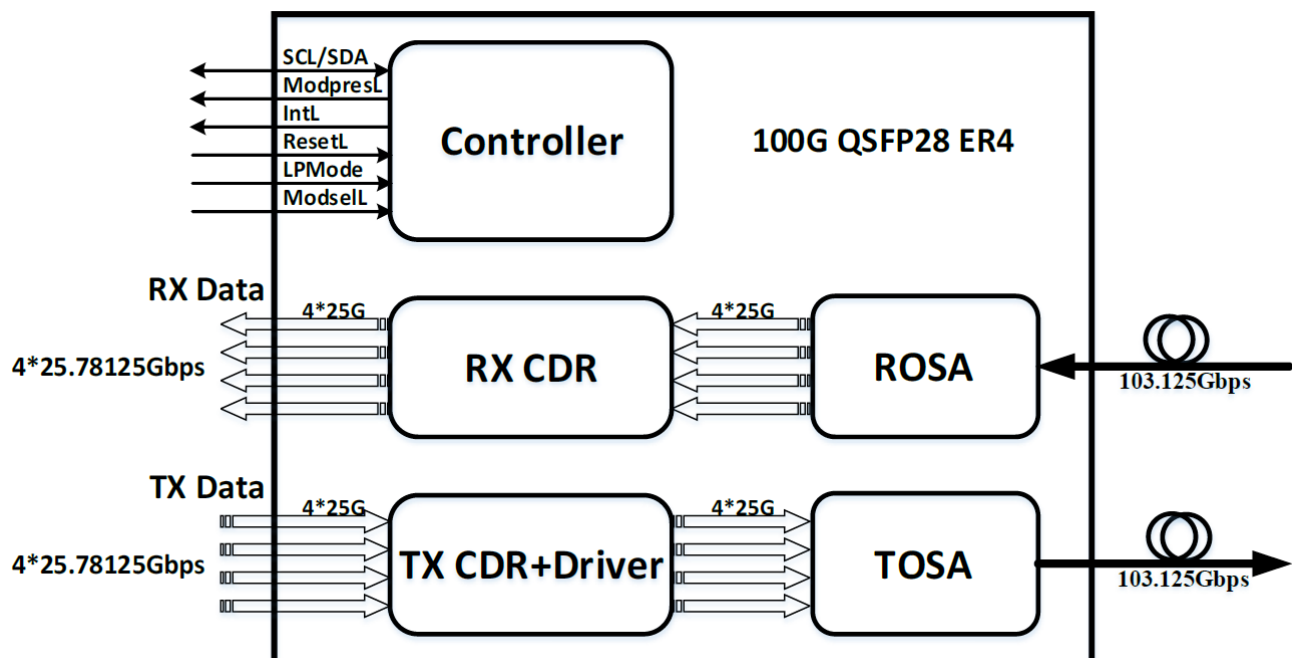
**Mechanical Specifications**

29.6±0.1

8.5±0.1

6.25

12.4±0.2

T   R

18.35±0.10

(122.0)

72.4 0 -0.2

18.45 MAX
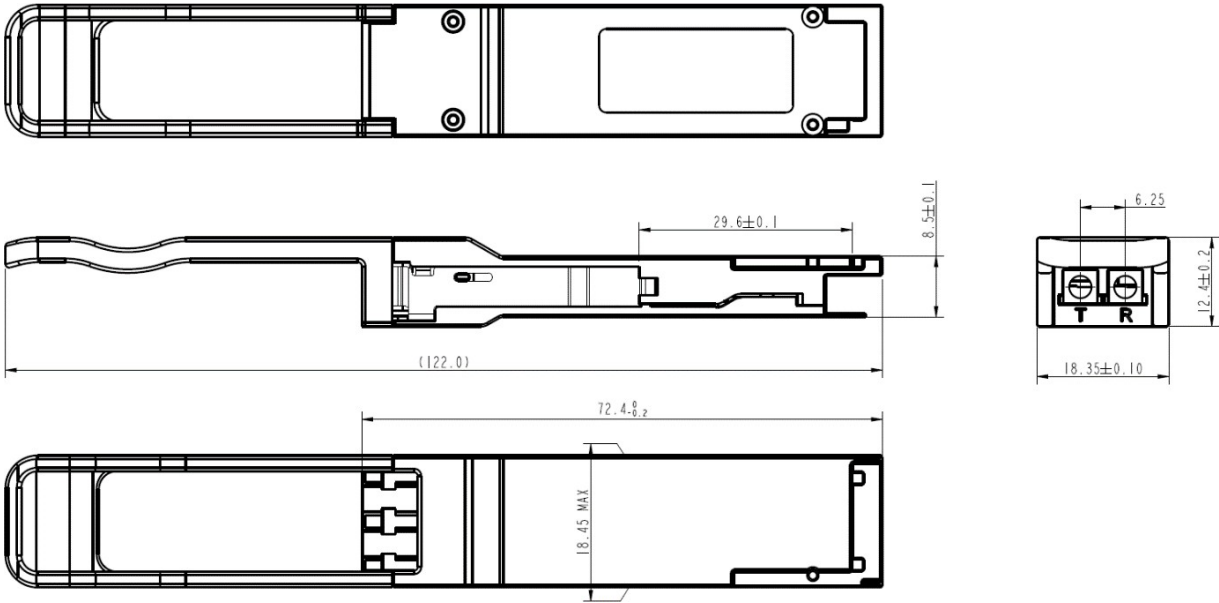
**OptioConnect**
**Innovation for the Future of High-Speed Networking**

**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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