# WTQ2885P10C1CN1 QSFP28 Transceiver

100G Multirate MMF 100m MPO Connector / Product Overview 3

| Part Number | Temperature |
|---|---|
| WTQ2885P10C1CN1 | 0°C~+70°C |




## 1. Product Overview

General Description

This product is a parallel 100/112Gb/s Quad Small Form-factor Pluggable (QSFP28) optical module. It provides increased port density and total system cost savings. The QSFP28 full-duplex optical module offers 4 independent transmit and receive channels, each capable of up 25/28Gb/s operation for an aggregate data rate of 100/112Gb/s on 100 meters of OM4 multi-mode fiber.

An optical fiber ribbon cable with an MTP/MPO connector can be plugged into the QSFP28 module receptacle. Proper alignment is ensured by the guide pins inside the receptacle. The cable usually cannot be twisted for proper channel to channel alignment. Electrical connection is achieved through an MSA-compliant 38-pin edge type connector.

The module operates by a single +3.3V power supply. LVCMOS/LVTTL global control signals, such as Module Present, Reset, Interrupt and Low Power Mode, are available with the modules. A 2-wire serial interface is available to send and receive more complex control signals, and to receive digital diagnostic information. Individual channels can be addressed and unused channels can be shut down for maximum design flexibility.

The product is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP28 Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference. The module offers very high functionality and feature integration, accessible via a two-wire serial interface.

### Features

- QSFP28 MSA compliant
- Compliant to IEEE 802.3bm 100GBASE-SR4
- Four independent full-duplex channels
- Supports 103.1Gb/s to 112.2Gb/s aggregate bit rate
- Up to 100m OM4 MMF transmission
- Operating case temperature: 0°Cto 70°C
- Single 3.3V power supply
- 4x25G electrical interface (OIF CEI-28G- VSR)
- Maximum power consumption 2.5W
- MTP/MPO optical connector
- RoHS-6 compliant

### Applications

- 4x28Gb/s Multimode OTN
- 128G Fiber Channel
- InfiniBand QDR, DDR and SDR
- 100G Ethernet

## 2. Ordering Information

| Part Number | Data Rate (Gbps) | Wavelength (nm) | Transmission Distance(m) | Temperature (oC) (Operating Case) |
|---|---|---|---|---|
| WTQ2885P10C1CN1 | 103.1/112.2Gb/s | 4x850 | 100m MMF | 0°C~+70°C |

## 3. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Units | Notes |
|---|---|---|---|---|---|
| Storage Temperature | TS | -40 | 85 | degC | |
| Operating Case Temperature | TOP | 0 | 70 | degC | |
| Power Supply Voltage | VCC | -0.5 | 3.6 | V | |
| Relative Humidity (non-condensation) | RH | 0 | 85 | % | |
| Damage Threshold, each Lane | THd | 3.4 | | dBm | |

## 4. Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Units |
|---|---|---|---|---|---|
| Operating Case Temperature | TOP | 0 | | 70 | degC |
| Power Supply Voltage | VCC | 3.135 | 3.3 | 3.465 | V |
| Data Rate, each Lane | | | 25.78125 | 28.05 | Gb/s |
| Data Rate Accuracy | | -100 | | 100 | ppm |
| Pre-FEC Bit Error Ratio | | | | 5x10-5 | |
| Post-FEC Bit Error Ratio | | | | 1x10-12 | |
| Control Input Voltage High | | 2 | | Vcc | V |
| Control Input Voltage Low | | 0 | | 0.8 | V |
| Link Distance (OM3 MMF) | D1 | | | 70 | m |
| Link Distance (OM4 MMF) | D2 | | | 100 | m |

## 5. Recommended Operating Conditions

| Parameter | Test Point | Test Point | Min | Typical | Max | Units | Notes |
|---|---|---|---|---|---|---|---|
| Power Consumption | | | | | 2.5 | W | |
| Supply Current | Icc | Icc | | | 757 | mA | |
| Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) | Transmitter (each Lane) |
| Overload Differential Voltage pk-pk | TP1a | TP1a | 900 | | | mV | |
| Common Mode Voltage (Vcm) | TP1 | TP1 | -350 | | 2850 | mV | 1 |
| Differential Termination Resistance Mismatch | TP1 | TP1 | | | 10 | % | At 1MHz |

| Parameter | Test Point | Test Point | Min | Typical | Max | Units | Notes |
|---|---|---|---|---|---|---|---|
| Differential Return Loss (SDD11) | TP1 | TP1 | | | See CEI- 28G-VSR Equation 13-19 | dB | |
| Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11) | TP1 | TP1 | | | See CEI- 28G-VSR Equation 13-20 | dB | |
| Stressed Input Test | TP1a | TP1a | See CEI- 28G-VSR Section 13.3.11.2.1 | | | | |
| Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) | Receiver (each Lane) |
| Differential Voltage, pk-pk | TP4 | | | | 900 | mV | |
| Common Mode Voltage (Vcm) | TP4 | -350 | -350 | | 2850 | mV | 1 |
| Common Mode Noise, RMS | TP4 | | | | 17.5 | mV | |
| Differential Termination | TP4 | | | | 10 | % | At 1MHz |
| Resistance Mismatch | | | | | | | |
| Differential Return Loss (SDD22) | TP4 | | | | See CEI- 28G-VSR Equation 13-19 | dB | |
| Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22) | TP4 | | | | See CEI- 28G-VSR Equation 13-21 | dB | |
| Common Mode Return Loss (SCC22) | TP4 | | | | -2 | dB | 2 |
| Transition Time, 20 to 80% | TP4 | 9.5 | 9.5 | | | ps | |
| Vertical Eye Closure (VEC) | TP4 | | | | 5.5 | dB | |
| Eye Width at 10-15 probability (EW15) | TP4 | 0.57 | 0.57 | | | UI | |
| Eye Height at 10-15 probability (EH15) | TP4 | 228 | 228 | | | mV | |

# 6. Recommended Operating Conditions

| Parameter | Symbol | Min | Max | Units | Notes |
|---|---|---|---|---|---|
| Temperature monitors absolute error | DMI_Temp | -3 | 3 | degC | Over operating temperature range |
| Supply voltage monitor absolute error | DMI _VCC | -0.15 | 0.15 | V | Over full operating range |
| Channel RX power monitor absolute error | DMI_RX_Ch | -2 | 2 | dB | 1 |
| Channel Bias current monitor | DMI_Ibias_Ch | -10% | 10% | mA | Ch1~Ch4 |

| Parameter | Symbol | Min | Max | Units | Notes |
|---|---|---|---|---|---|
| Channel TX power monitor absolute error | DMI_TX_Ch | -2 | 2 | dB | 1 |

## 7. Optical Parameters

| Parameter | Symbol | Min | Typical | Max | Units | Notes |
|---|---|---|---|---|---|---|
| Transmitter | Transmitter | Transmitter | Transmitter | Transmitter | Transmitter | Transmitter |
| Center Wavelength | λC | 840 | 850 | 860 | nm | |
| RMS Spectral Width | Δλrms | | | 0.6 | nm | |
| Average Launch Power, each Lane | PAVG | -9 | | 2.4 | dBm | |
| Optical Modulation Amplitude (OMA), each Lane | POMA | -7.1 | | 3.0 | dBm | 1 |
| Launch Power in OMA minus TDEC, each Lane | | -8 | | | dBm | |
| Transmitter and Dispersion Eye Closure (TDEC), each Lane | | | | 5 | dB | |
| Extinction Ratio | ER | 3.0 | | | dB | |
| Optical Return Loss Tolerance | TOL | | | 12 | dB | |
| Average Launch Power OFF Transmitter, each Lane | Poff | | | -30 | dBm | |
| Encircled Flux | | ≥ 86% at 19 μm ≤ 30% at 4.5 μm | ≥ 86% at 19 μm ≤ 30% at 4.5 μm | ≥ 86% at 19 μm ≤ 30% at 4.5 μm | | |
| Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3} | | {0.3, 0.38, 0.45, 0.35, 0.41, 0.5} | {0.3, 0.38, 0.45, 0.35, 0.41, 0.5} | {0.3, 0.38, 0.45, 0.35, 0.41, 0.5} | | 2 |
| Receiver | Receiver | Receiver | Receiver | Receiver | Receiver | Receiver |
| Center Wavelength | λC | 840 | 850 | 860 | nm | |
| Damage Threshold, each Lane | THd | 3.4 | | | dBm | 3 |
| Average Receive Power, each Lane | | -10.9 | | 2.4 | dBm | |
| Receive Power (OMA), each Lane | | | | 3.0 | dBm | |
| Receiver Sensitivity (OMA), each Lane | SEN | | | -9.2 | dBm | for BER = 5x10-5 |
| Stressed Receiver Sensitivity (OMA), each Lane | | | | -5.2 | dBm | 4 |
| Receiver Reflectance | RR | | | -12 | dB | |
| LOS Assert | LOSA | -30 | | | dBm | |
| LOS Deassert | LOSD | | | -12 | dBm | |
| LOS Hysteresis | LOSH | 0.5 | | | dB | |

| Parameter | Symbol | Min | Typical | Max | Units | Notes |
|---|---|---|---|---|---|---|
| Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test | Conditions of Stress Receiver Sensitivity Test |
| Stressed Eye Closure (SEC), Lane under Test | | | 4.3 | | dB | |
| Stressed Eye J2 Jitter, Lane under Test | | | 0.39 | | UI | |
| Stressed Eye J4 Jitter, Lane under Test | | | | 0.53 | UI | |
| OMA of each Aggressor Lane | | | 3 | | dBm | |
| Stressed Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}, | | {0.28, 0.5, 0.5, 0.33, 0.33, 0.4} | {0.28, 0.5, 0.5, 0.33, 0.33, 0.4} | {0.28, 0.5, 0.5, 0.33, 0.33, 0.4} | | |
| Hit ratio 5x10-5 hits per sample | | | | | | |

## 8. Pin Descriptions

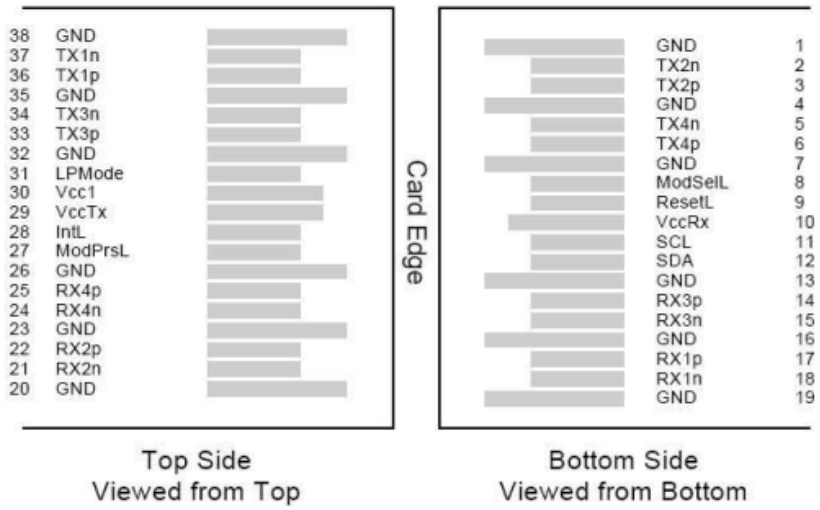
| PIN | Logic | Symbol | Name/Description | Notes |
|---|---|---|---|---|
| 1 | | GND | Ground | 1 |
| 2 | CML-I | Tx2n | Transmitter Inverted Data Input | |
| 3 | CML-I | Tx2p | Transmitter Non-Inverted Data output | |
| 4 | | GND | Ground | 1 |
| 5 | CML-I | Tx4n | Transmitter Inverted Data Input | |
| 6 | CML-I | Tx4p | Transmitter Non-Inverted Data output | |
| 7 | | GND | Ground | 1 |
| 8 | LVTLL-I | ModSelL | Module Select | |
| 9 | LVTLL-I | ResetL | Module Reset | |
| 10 | | VccRx | +3.3V Power Supply Receiver | 2 |
| 11 | LVCMOS-I/O | SCL | 2-Wire Serial Interface Clock | |
| 12 | LVCMOS-I/O | SDA | 2-Wire Serial Interface Data | |
| 13 | | GND | Ground | |
| 14 | CML-O | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | CML-O | Rx3n | Receiver Inverted Data Output | |
| 16 | | GND | Ground | 1 |
| 17 | CML-O | Rx1p | Receiver Non-Inverted Data Output | |

| PIN | Logic | Symbol | Name/Description | Notes |
|---|---|---|---|---|
| 18 | CML-O | Rx1n | Receiver Inverted Data Output | |
| 19 | | GND | Ground | 1 |
| 20 | | GND | Ground | 1 |
| 21 | CML-O | Rx2n | Receiver Inverted Data Output | |
| 22 | CML-O | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | | GND | Ground | 1 |
| 24 | CML-O | Rx4n | Receiver Inverted Data Output | 1 |
| 25 | CML-O | Rx4p | Receiver Non-Inverted Data Output | |
| 26 | | GND | Ground | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present | |
| 28 | LVTTL-O | IntL | Interrupt | |
| 29 | | VccTx | +3.3 V Power Supply transmitter | 2 |
| 30 | | Vcc1 | +3.3 V Power Supply | 2 |
| 31 | LVTTL-I | LPMode | Low Power Mode | |
| 32 | | GND | Ground | 1 |
| 33 | CML-I | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | CML-I | Tx3n | Transmitter Inverted Data Output | |
| 35 | | GND | Ground | 1 |
| 36 | CML-I | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | CML-I | Tx1n | Transmitter Inverted Data Output | |
| 38 | | GND | Ground | 1 |

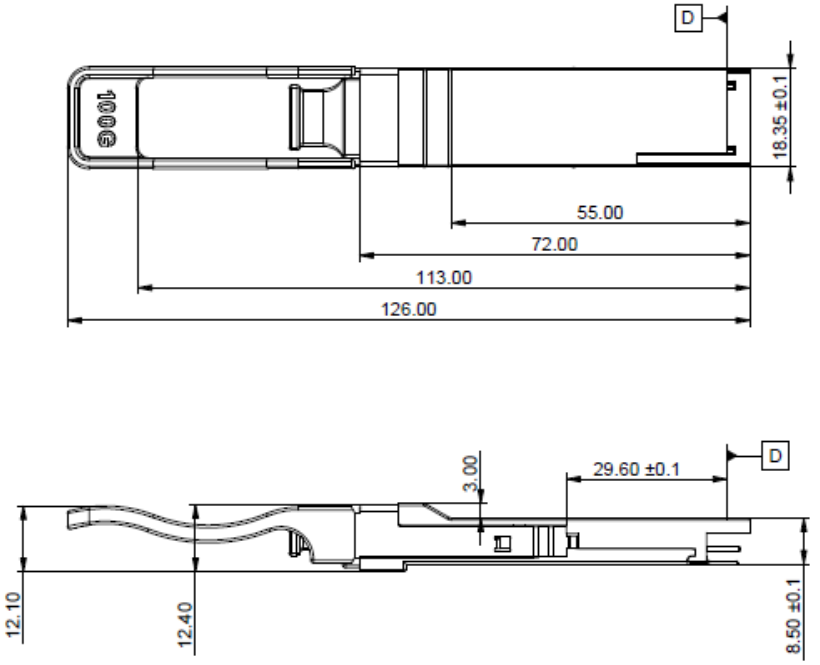
# 9. Additional Specifications

| Fiber # | Lane Assignment |
|---|---|
| 1 | RX0 |
| 2 | RX1 |
| 3 | RX2 |
| 4 | RX3 |
| 5,6,7,8 | Not used |
| 9 | TX3 |
| 10 | TX2 |
| 11 | TX1 |
| 12 | TX0 |

## 10. Technical Figure 1




## 11. Technical Figure 2




## 12. Revision History

| Version | Date | Description | Prepared by |
|---|---|---|---|
| V6 | 2025 | Unified WincoTek datasheet format | WincoTek |
| V6.1 | 2026-10-23 | Engineering and format review | WincoTek |