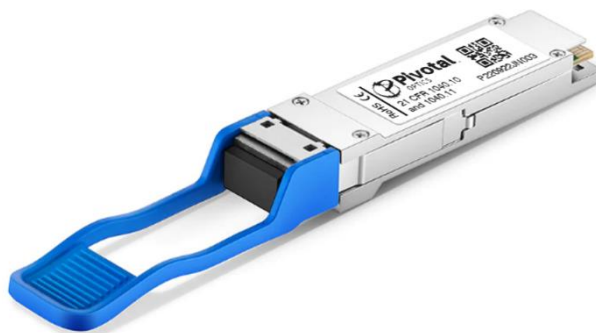


# QSFP28-100G-PSM4

## 100GBase QSFP28 PSM4 4CH-1310nm SMF 500m Transceiver

### Product Features

- 4 independent full-duplex channels
- Up to 28Gb/s data rate per channel
- QSFP28MSA compliant
- Compliant to IEEE 802.3bm 100GBASE PSM4
- Up to 500m reach for G.652 SMF
- Maximum power consumption 3.5W
- Single +3.3V power supply
- Operating case temperature: 0 to 70oC
- RoHS-6 compliantCase operating temperature:
  - Commercial: 0 ~ 70°C



### Product Applications

- 100GBASE Ethernet Links
- Infiniband QDR and DDR interconnects
- Data Center

### I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

| Parameter                            | Symbol | Min. | Typ. | Max. | Units |
|--------------------------------------|--------|------|------|------|-------|
| Storage Temperature                  | Ts     | -40  |      | 85   | °C    |
| Power Supply Voltage                 | Vcc    | -0.5 |      | 3.6  | V     |
| Relative Humidity (non-condensation) | RH     | 0    |      | 85   | %     |
| Damage Threshold (each lane)         | THd    | 4.5  |      |      | dBm   |

### II. Operating Specifications

| Parameter                  | Symbol | Min.  | Typ.     | Max.  | Units | Notes      |
|----------------------------|--------|-------|----------|-------|-------|------------|
| Case Operating Temperature | TC     | 0     |          | 70    | °C    | Commercial |
| Power Supply Voltage       | Vcc    | 3.135 | 3.3      | 3.465 | V     |            |
| Data Rate, each Lane       |        |       | 25.78125 |       | Gb/s  |            |
| Control Input Voltage High |        | 2     |          | Vcc   | V     |            |
| Control Input Voltage Low  |        | 0     |          | 0.8   | V     |            |
| Link Distance              |        |       |          | 500   | m     |            |

### III. Optical Characteristics

| Parameter                                                  | Symbol      | Min                                  | Typical | Max  | Unit  | Notes |
|------------------------------------------------------------|-------------|--------------------------------------|---------|------|-------|-------|
| <b>Transmitter</b>                                         |             |                                      |         |      |       |       |
| Center Wavelength                                          | $\lambda_C$ | 840                                  | 850     | 860  | nm    |       |
| Side Mode Suppression Ratio                                | SMSR        | 30                                   |         |      | dB    |       |
| Total Average Launch Power                                 | PT          |                                      |         | 9.5  | dBm   |       |
| Avg. Optical Launch Power (each lane)                      | PAVG        | 1                                    |         | 3.5  | dBm   |       |
| Optical Modulation Amplitude (each lane)                   | POMA        | 2                                    |         | 4.5  | dBm   | 1     |
| Difference in launch power between any two lanes (OMA)     | Ptx,diff    |                                      |         | 5    | dB    |       |
| Launch Power in OMA minus TDP (each lane)                  |             | 1                                    |         |      | dBm   |       |
| Transmitter and Dispersion Penalty (each lane)             | TDP         |                                      |         | 3.2  | dB    |       |
| Extinction Ratio                                           | ER          | 3.5                                  |         |      | dB    |       |
| Relative Intensity Noise                                   | Rin         |                                      |         | -128 | Db/Hz |       |
| Optical Return Loss Tolerance                              | TOL         |                                      |         | 12   | dB    |       |
| Transmitter Reflectance                                    | RT          |                                      |         | -12  | dB    |       |
| Transmitter eye mask<br>{ X1, X2, X3, Y1, Y2, Y3 }         |             | { 0.25, 0.4, 0.45, 0.25, 0.28, 0.4 } |         |      |       |       |
| Average Launch Power OFF Transmitter (each lane)           | Poff        |                                      |         | -30  | dBm   |       |
| <b>Receiver</b>                                            |             |                                      |         |      |       |       |
| Center Wavelength                                          | $\lambda_C$ | 840                                  | 850     | 860  | nm    |       |
| Damage Threshold (each lane)                               | THd         | 4.5                                  |         |      | dBm   | 2     |
| Average Receive Power (each lane)                          |             | -9                                   |         | 3.5  | dBm   |       |
| Receiver Reflectance                                       | RR          |                                      |         | -12  | dB    |       |
| Receive Power (OMA), (each lane)                           |             |                                      |         | 4.5  | dBm   |       |
| Receiver Sensitivity (OMA), (each lane)                    | SEN         |                                      |         | -9   | dBm   |       |
| Stressed Receiver Sensitivity (OMA), each Lane             |             |                                      |         | 5.5  | dBm   |       |
| LOS Assert                                                 | LOSA        |                                      | -18     |      | dBm   |       |
| LOS De-assert                                              | LOSD        |                                      | -15     |      | dBm   |       |
| LOS hysteresis                                             | LOSH        | 0.5                                  |         |      | dB    |       |
| Receiver Electrical 3 dB upper Cutoff Frequency, each Lane | Fc          |                                      |         | 31   | GHz   |       |

**Notes:**

1. Even if the TDP < 1 dB, the OMA min must exceed the minimum value specified here.
2. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.

**IV. Electrical Characteristics**

| Parameter                                         | Symbol              | Min. | Typ. | Max. | Unit | Notes          |
|---------------------------------------------------|---------------------|------|------|------|------|----------------|
| Power Consumption                                 | p                   |      |      | 3.5  | W    |                |
| Supply Current                                    | Icc                 |      |      | 1.1  | A    |                |
| Transceiver Power-on Initialization Time          |                     |      |      | 2000 | ms   | 1              |
| <b>Transmitter</b>                                |                     |      |      |      |      |                |
| Single-ended Input Voltage Tolerance              |                     | -0.3 |      | 4.0  | V    | 2              |
| AC Common Mode Input Voltage Tolerance            |                     | 15   |      |      | mV   | RMS            |
| Differential Input Voltage Swing Threshold (LOSA) |                     | 50   |      |      | mVpp | LOSA Threshold |
| Differential Input Voltage Swing                  | V <sub>in,pp</sub>  | 190  |      | 700  | mVpp |                |
| Differential Input Impedance                      | Z <sub>in</sub>     | 90   | 100  | 110  | Ohm  |                |
| <b>Receiver</b>                                   |                     |      |      |      |      |                |
| Single-ended Output Voltage                       |                     | -0.3 |      | 4.0  | V    | 3              |
| AC Common Mode Output Voltage                     |                     |      |      | 7.5  | mV   | RMS            |
| Differential Output Voltage Swing                 | V <sub>out,pp</sub> | 300  |      | 850  | mVpp |                |
| Differential Output Impedance                     | Z <sub>out</sub>    | 90   | 100  | 110  | Ohm  |                |

**Notes:**

1. Power-on Initialization Time is the time from when the power supply voltages reach and remain above the minimum recommended operating supply voltages to the time when the module is fully functional.
2. Referred to TP1 signal common
3. Referred to signal common
4. The single ended input voltage tolerance is the allowable range of the instantaneous input signals.

**Warranty**

All transceivers feature a limited lifetime warranty.

**Disclaimer**

External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.