

DATA SHEET

QSFP28-PSM4-C-GEN

100Gb/s QSFP28 PSM4 2km Optical Transceiver

QSFP28-PSM4-C-GEN Overview

QSFP28-PSM4-C-GEN QSFP28 100Gbps PSM4 optical transceiver offers 4 independent transmit and receive channels, each capable of 25.78125Gbps operation for an aggregate data rate of 103.1Gbps 2km of single mode fiber. An optical fiber ribbon cable with an MPO/MTP connector can be plugged into the QSFP28 module receptacle.

Product Features

- Supports 103.1Gb/s bit rate
- Compliant with 100G PSM4 Specification 2.0
- Compliant with 100G Ethernet IEEE 802.3bm
- Compliant with SFF-8665 (QSFP28 Solution) Revision 1.8
- MPO optical connector
- Built-in digital diagnostic functions
- Up to 2km transmission on SMF
- RoHS Compliant
- Operating temperature range: 0°C to 70°C

Applications

- 100G Ethernet
- InfiniBand QDR and DDR interconnects

Ordering Information

| Part Number | Description | Color on Clasp |
|---|--|----------------|
| QSFP28-PSM4-C-GEN | 100G QSFP28 PSM4 MPO Connectors, up to 2km on SMF, with DOM function | Yellow |
| For More Information: SONGXIN TAIPEI TECH SOLUTIONS CO., LTD. Web: www.songxin.com.tw Email: oversea@songxin.com.tw | | |

General Specifications

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---------------------------|------------------|------|----------|------|------|---------|
| Signaling Rate(Each Lane) | | | 25.78125 | | Gb/s | |
| Data speed tolerance | | -100 | | 100 | ppm | |
| Operating Temperature | T _C | 0 | | 70 | °C | 1 |
| Storage Temperature | T _{STO} | -40 | | 85 | °C | 2 |
| Supply Current | I _{cc} | | | 1200 | mA | |
| Input Voltage | V _{CC} | 3.14 | 3.3 | 3.46 | V | |
| Power Consumption | P | | | 3.5 | V | |

Notes:

1. Case temperature
2. Ambient temperature

Link Distances

| Data Rate | Fiber Type | Distance Range (km) |
|-----------|-------------|---------------------|
| 100 Gb/s | 9/125um SMF | 2 |

Optical – Characteristics – Transmitter

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|--|----------------|-------|------|------|------|---------|
| Average Launch Power(Each Lane) | P_{TX} | -9.4 | | 2 | dBm | |
| Optical Center Wavelength(Each Lane) | λ_c | 1295 | 1310 | 1325 | nm | |
| Optical Modulation Amplitude(Each Lane) | OMA | -5.15 | | 2.2 | dB | |
| Extinction Ratio | ER | 3.5 | | | dB | |
| Optical Return Loss Tolerance | TOL | | | 20 | dB | |
| Average Launch Power of OFF Transmitter(Each lane) | P_{OUT_OFF} | | | -30 | dBm | |
| Transmitter Eye Mask Margin | EMM | 5 | | | % | |

Optical – Characteristics – Receiver

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---------------------------------------|---------------|--------|------|--------|------|---------|
| Optical Center Wavelength | λ_c | 1295 | 1310 | 1325 | nm | |
| Optical Input Power(each lane) | P_{RX} | -12.66 | | 2 | dBm | 1 |
| Damage Threshold | P | 3 | | | dBm | |
| Receiver Sensitivity (OMA)(Each Lane) | R_{X_SEN1} | | | -11.35 | dBm | 2 |
| LOS Assert | LOS_A | | TBD | | dBm | |
| LOS De-Assert | LOS_D | | TBD | | dBm | |
| LOS Hysteresis | LOS_H | | TBD | | dB | |

Notes:

1. Average, Informative
2. BER= 5×10^{-5}

Electrical – Characteristics – Transmitter

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|-------------------------------|--------------------------------|-----|-----|-----|------|---------|
| Input differential impedance | R _{IN} | 90 | 100 | 110 | Ω | |
| Differential data input swing | V _{IN_PP} | 200 | | 900 | mV | |
| TP1/TP1a Interface | Compliant to IEEE802.3ba XLPP1 | | | | | |

Electrical – Characteristics – Receiver

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|--------------------------------|--------------------------------|-----|-----|-----|------|---------|
| Differential Output Impedance | R _{OUT} | 90 | 100 | 110 | Ω | |
| Differential data output swing | V _{OUT_PP} | 200 | | 900 | mV | |
| TP4 Interface | Compliant to IEEE802.3ba XLPP1 | | | | | |

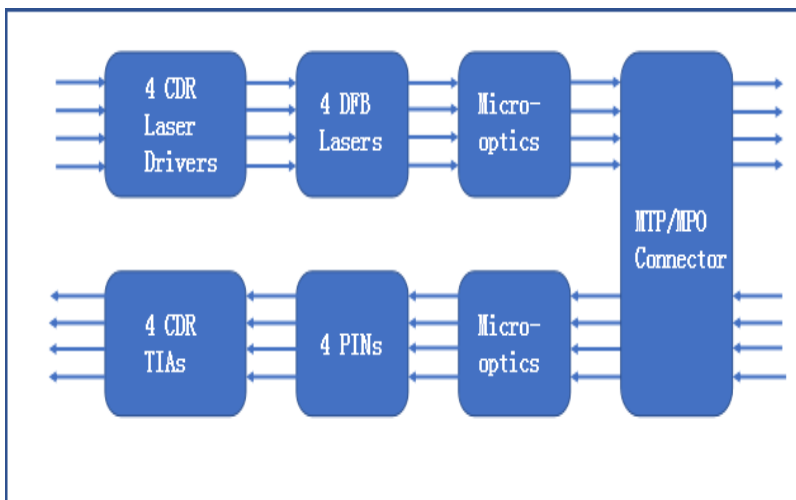
Digital Diagnostic Monitor Functions

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|--------------|-------|-----|------|------|---------|
| Temperature monitor absolute error | DMI_Temp | -3 | | 3 | °C | 1 |
| Supply voltage monitor absolute error | DMI_VCC | -0.15 | | 0.15 | V | 2 |
| Channel RX power monitor absolute error | DMI_RX_Ch | -3 | | 3 | dB | 3 |
| Channel Bias current monitor | DMI_Ibias_Ch | -10% | | 10% | mA | 3 |
| Channel TX power monitor absolute error | DMI_TX_Ch | -3 | | 3 | dB | 3 |

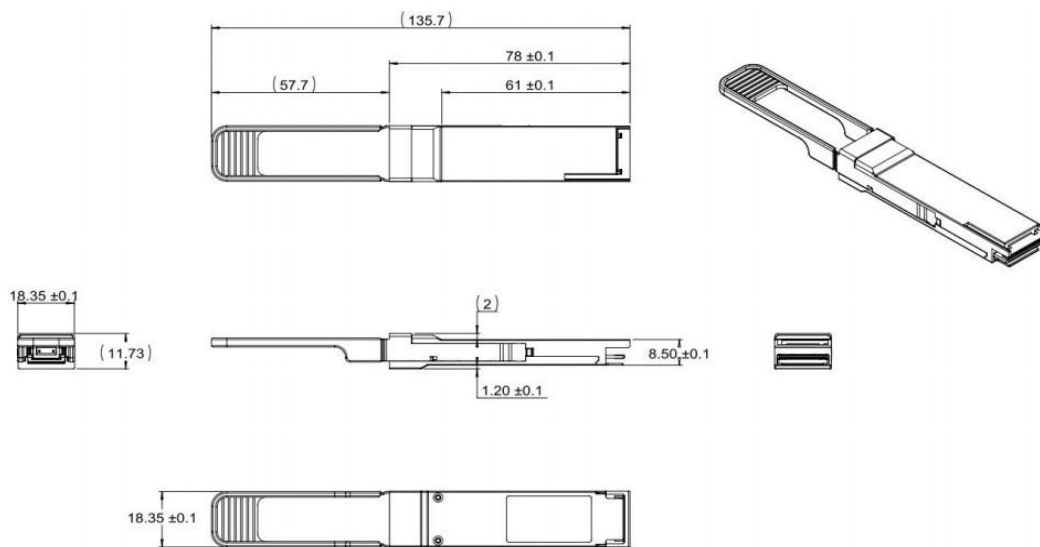
Notes:

1. Over operating temp
2. Full operating range
3. Ch1-Ch4

Block-Diagram-of-Transceiver



Dimensions

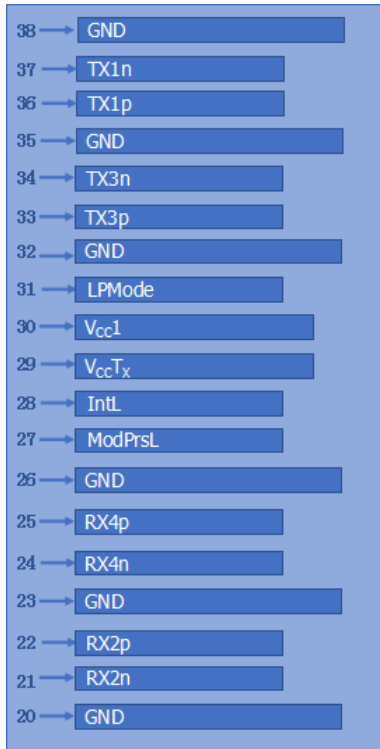


ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
 UNIT: mm

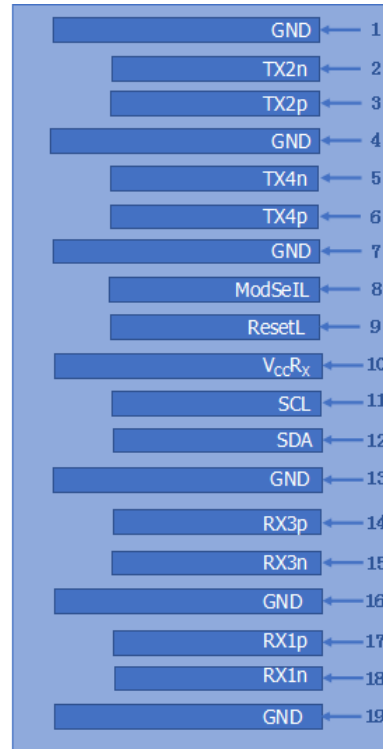
Attention:

To minimize MPO connection induced reflections, an MPO receptacle with 8-degree angled end-face is utilized for this product. A female MPO connector with 8-degree endface should be used with this product.

Electrical Pad Layout



Top Board



Bottom Board

Pin Assignment

| PIN # | Symbol | Description | Remarks |
|--------------|--------------------------------|--|----------------|
| 1 | GND | Ground | 5 |
| 2 | Tx2n | Transmitter Inverted Data Input, LAN2 | |
| 3 | Tx2p | Transmitter Non-Inverted Data Input, LAN2 | |
| 4 | GND | Ground | 5 |
| 5 | Tx4n | Transmitter Inverted Data Input, LAN4 | |
| 6 | Tx4p | Transmitter Non-Inverted Data Input, LAN4 | |
| 7 | GND | Ground | 5 |
| 8 | ModSelL | Module select pin, the module responds to two-wire serial communication when low level | 1 |
| 9 | ResetL | Module Reset | 2 |
| 10 | V _{cc} R _X | +3.3V Power Supply Receiver | |
| 11 | SCL | 2-wire serial interface clock | |
| 12 | SDA | 2-wire serial interface data | |
| 13 | GND | Ground | 5 |
| 14 | Rx3p | Receiver Non-Inverted Data Output, LAN3 | |
| 15 | Rx3n | Receiver Inverted Data Output, LAN3 | |
| 16 | GND | Ground | 5 |
| 17 | Rx1p | Receiver Non-Inverted Data Output, LAN1 | |
| 18 | Rx1n | Receiver Inverted Data Output, LAN1 | |
| 19 | GND | Ground | 5 |
| 20 | GND | Ground | 5 |
| 21 | Rx2n | Receiver Inverted Data Output, LAN2 | |
| 22 | Rx2p | Receiver Non-Inverted Data Output, LAN2 | |
| 23 | GND | Ground | 5 |
| 24 | Rx4n | Receiver Inverted Data Output, LAN4 | |
| 25 | Rx4p | Receiver Non-Inverted Data Output, LAN4 | |
| 26 | GND | Ground | 5 |
| 27 | ModPrsL | The module is inserted into the indicate pin and grounded in the module. | 3 |
| 28 | IntL | Interrupt | 4 |
| 29 | V _{cc} T _X | +3.3V Power Supply transmitter | |
| 30 | V _{cc} 1 | +3.3V Power Supply | |
| 31 | LPMODE | Low Power Mode | 5 |
| 32 | GND | Ground | 5 |

| | | | |
|----|------|---|---|
| 33 | Tx3p | Transmitter Non-Inverted Data Input, LAN3 | |
| 34 | Tx3n | Transmitter Inverted Data Input, LAN3 | |
| 35 | GND | Ground | 5 |
| 36 | Tx1p | Transmitter Non-Inverted Data Input, LAN1 | |
| 37 | Tx1n | Transmitter Inverted Data Input, LAN1 | |
| 38 | GND | Ground | 5 |

Notes:

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held low by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is High, the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that during hot plugging, the module will issue this information to complete the reset interrupt without resetting
3. This pin is active high, indicating that the module is running under a low power module.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc on the motherboard. When it is low, it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source
5. Circuit ground is internally isolated from chassis ground.

References

1. 100G Ethernet IEEE 802.3bm.
2. 100G PSM4 Specification 2.0