

Q28-100GP4-BXD3129-20-BR-C

Brocade® (Formerly) Compatible TAA 100GBase-BX LR1 PAM4 QSFP28 Transceiver Single Lambda (SMF, 1311nmTx/1291nmRx, 20km, LC, DOM)

Features:

- Compliant with QSFP28 MSA
- Compliant with SFF-8636 Rev 2.10a
- Supports 100Gbps
- Single 3.3V Power Supply
- 4x25G Electrical Interface Compliant with OIF CEI-28G-VSR
- Bidi LC Connectors
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- RoHS Compliant and Lead Free



Applications:

- 100GBase Ethernet
- Datacenter

Product Description

This Brocade® (Formerly) QSFP28 transceiver provides 100GBase-BX LR1 throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1311nmTx/1291nmRx via an LC connector. It is guaranteed to be 100% compatible with the equivalent Brocade® (Formerly) 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.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------------|--------------------------------|-------|------|-------|------|
| Power Supply Voltage | V _{CC} | 3.135 | 3.3 | 3.465 | V |
| Supply Voltage | V _{CC} | -0.5 | | 3.6 | V |
| Storage Temperature | T _{stg} | -40 | | 85 | °C |
| Operating Case Temperature | T _c | 0 | | 70 | °C |
| Operating Relative Humidity | RH | 5 | | 85 | % |
| Damage Threshold | R _x dm _g | 7.6 | | | dBm |
| Power Dissipation | P _{DISS} | | | 4.5 | W |

Notes:

1. Exceeding any one of these values may damage the device permanently.
2. Power Supply Specifications, Instantaneous, Sustained, and Steady State Current are compliant with QSFP28 MSA Power Classification.

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|--------------------------------|------|------|------|-------|-------------------------|
| Transmitter | | | | | | |
| Differential Data Input Swing Per Lane | | 900 | | | mVp-p | |
| Differential Input Impedance | Z _{IN} | 90 | 100 | 110 | Ω | |
| DC Common-Mode Voltage (V _{cm}) | | -350 | | 2850 | mV | |
| Receiver | | | | | | |
| Differential Output Amplitude | | | | 900 | mVp-p | |
| Differential Output Impedance | Z _{OUT} | 90 | 100 | 110 | Ω | |
| Output Rise/Fall Time | T _r /T _f | 12 | | | ps | 20-80% |
| Eye Width | | 0.57 | | | UI | |
| Eye Height Differential | | 228 | | | mV | @TP4, 1E ⁻¹⁵ |
| DC Common-Mode Voltage (V _{cm}) | | -350 | | 2850 | mV | 1 |

Notes:

1. V_{cm} is generated by the host. Specification includes effects of ground offset voltage.

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--|-------------|-----------|--------|--------------------|------|-------|
| Transmitter | | | | | | |
| Signaling Speed | | | 53.125 | | GBd | |
| Modulation Format | | PAM4 | | | | |
| Center Wavelength | λ_C | 1304.5 | 1311 | 1317.5 | nm | |
| Side-Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Extinction Ratio | ER | 3.5 | | | dB | |
| Transmit OMA for TDECQ<1.4dB | TxOMA | 2.8 | | 6.8 | dBm | |
| Transmit OMA for 1.4dB<TDECQ<TDECQ (Maximum) | TxOMA | 1.4+TDECQ | | 6.8 | dBm | |
| Transmit Average Power | TxAVG | -0.2 | | 6.6 | dBm | 1 |
| Transmitter and Dispersion Eye Closure | TDECQ | | | 3.6 | dB | |
| Optical Return Loss Tolerance | | | | 15.6 | dB | 2 |
| Receiver | | | | | | |
| Signaling Speed | | | 53.125 | | GBd | |
| Center Wavelength | λ_C | 1284.5 | 1291 | 1297.5 | nm | |
| Damage Threshold | | 7.6 | | | dBm | |
| Receive Power (OMA _{outer}) | RxOMA | | | 6.8 | dBm | |
| Average Receive Power | RxAVG | -10 | | 6.6 | dBm | |
| Receiver Sensitivity (OMA _{outer}) | SenOMA | | | MAX (-7.6, SECQ-9) | dBm | 3 |
| 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 (minimum) 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. Transmitter reflectance is defined looking into the transmitter.
3. Sensitivity is specified at 2.4×10^{-4} BER.

Pin Descriptions

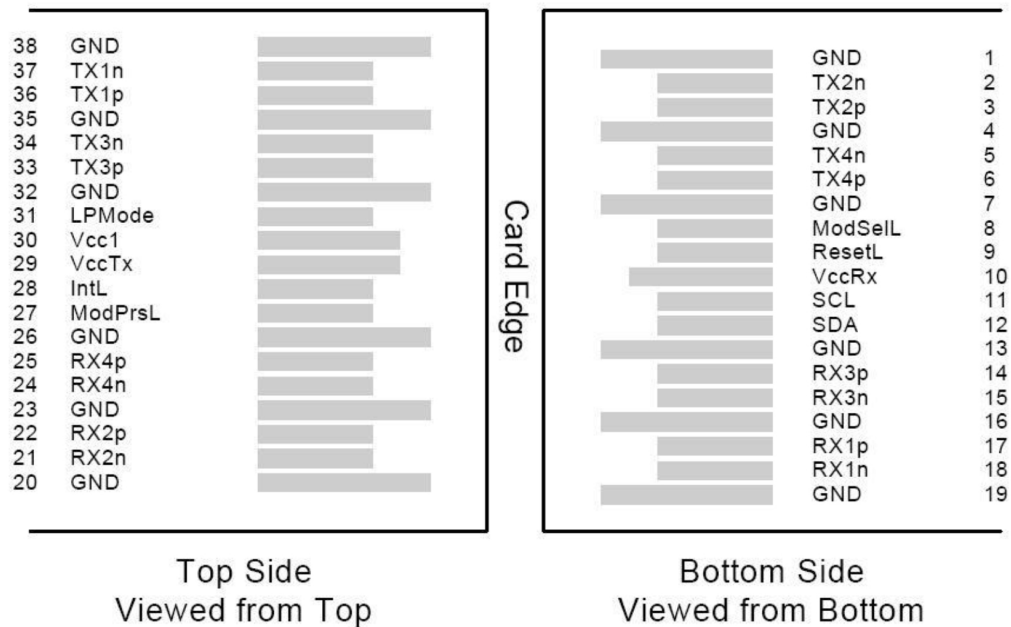
| Pin | Logic | Symbol | Name/Description | Notes |
|-----|------------|--------------|---|-------|
| 1 | | GND | Module Ground. | 1 |
| 2 | CML-I | Tx2- | Transmitter Inverted Data Input. | |
| 3 | CML-I | Tx2+ | Transmitter Non-Inverted Data Output. | |
| 4 | | GND | Module Ground. | 1 |
| 5 | CML-I | Tx4- | Transmitter Inverted Data Input. | |
| 6 | CML-I | Tx4+ | Transmitter Non-Inverted Data Input. | |
| 7 | | GND | Module Ground. | 1 |
| 8 | LVTLL-I | ModSelL | Module Select. | |
| 9 | LVTLL-I | ResetL | Module Reset. | |
| 10 | | VccRx | +3.3V Receiver Power Supply. | 2 |
| 11 | LVCNOS-I/O | SCL | 2-Wire Serial Interface Clock. | |
| 12 | LVCNOS-I/O | SDA | 2-Wire Serial Interface Data. | |
| 13 | | GND | Module Ground. | 1 |
| 14 | CML-O | Rx3+ | Receiver Non-Inverted Data Output. | |
| 15 | CML-O | Rx3- | Receiver Inverted Data Output. | |
| 16 | | GND | Module Ground. | 1 |
| 17 | CML-O | Rx1+ | Receiver Non-Inverted Data Output. | |
| 18 | CML-O | Rx1- | Receiver Inverted Data Output. | |
| 19 | | GND | Module Ground. | 1 |
| 20 | | GND | Module Ground. | 1 |
| 21 | CML-O | Rx2- | Receiver Inverted Data Output. | |
| 22 | CML-O | Rx2+ | Receiver Non-Inverted Data Output. | |
| 23 | | GND | Module Ground. | 1 |
| 24 | CML-O | Rx4- | Receiver Inverted Data Output. | 1 |
| 25 | CML-O | Rx4+ | Receiver Non-Inverted Data Output. | |
| 26 | | GND | Module Ground. | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present. | |
| 28 | LVTTL-O | IntL/RxLOSL | Interrupt. Optionally configurable as RxLOSL via the management interface (SFF-8636). | |
| 29 | | VccTx | +3.3V Transmitter Power Supply. | 2 |
| 30 | | Vcc1 | +3.3V Power Supply. | 2 |
| 31 | LVTTL-I | LPMode/TxDis | Low-Power Mode. Optionally configurable as TxDis via the management interface (SFF-8636). | |
| 32 | | GND | Module Ground. | 1 |
| 33 | CML-I | Tx3+ | Transmitter Non-Inverted Data Input. | |
| 34 | CML-I | Tx3- | Transmitter Inverted Data Input. | |

| | | | | |
|----|-------|------|--------------------------------------|---|
| 35 | | GND | Module Ground. | 1 |
| 36 | CML-I | Tx1+ | Transmitter Non-Inverted Data Input. | |
| 37 | CML-I | Tx1- | Transmitter Inverted Data Input. | |
| 38 | | GND | Module Ground. | 1 |

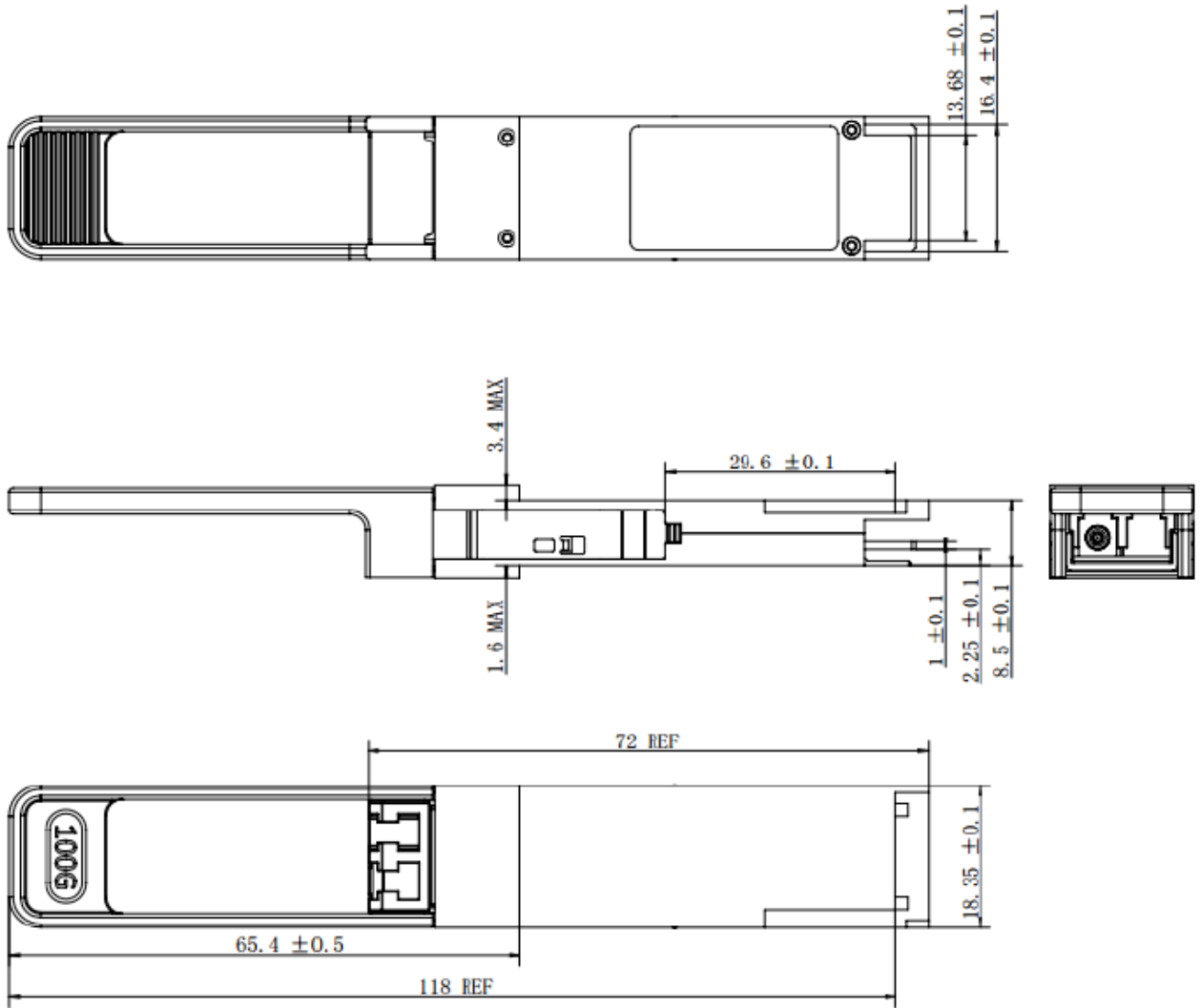
Notes:

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module, and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.

Electrical Pin-Out Details



Mechanical Specifications



About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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