



### **SFP-25GB-BX-U-20-J-OPC**

Juniper Networks® Compatible TAA 25GBase-BX SFP28 Transceiver (SMF, 1270nmTx/1330nmRx, 20km, LC, DOM)

#### **Features**

- SFF-8402 and SFF-8472 Compliance
- Simplex 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:**

- 25GBase Ethernet
- Access and Enterprise

#### **Product Description**

This Juniper Networks® compatible SFP28 transceiver provides 25GBase-BX throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1270nmTx/1330nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Juniper Networks®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.

## Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Typ.  | Max. | Unit | Notes |
|----------------------------|------------------|------|-------|------|------|-------|
| Maximum Supply Voltage     | V <sub>CC</sub>  | -0.3 |       | 4.0  | V    |       |
| Storage Temperature        | T <sub>stg</sub> | -40  |       | 85   | °C   |       |
| Operating Case Temperature | T <sub>c</sub>   | 0    | 25    | 70   | °C   |       |
| Relative Humidity          | RH               | 5    |       | 95   | %    |       |
| Data Rate                  | DR               |      | 24.33 |      | Gbps |       |
|                            |                  |      | 25.78 |      | Gbps |       |

## Electrical Characteristics

| Parameter                      |                      | Symbol              | Min.  | Typ. | Max.     | Unit  | Notes |
|--------------------------------|----------------------|---------------------|-------|------|----------|-------|-------|
| Power Supply Voltage           |                      | V <sub>CC</sub>     | 3.135 | 3.3  | 3.465    | V     |       |
| Power Supply Current           |                      | I <sub>CC</sub>     |       |      | 450      | mA    |       |
| Power Dissipation              |                      | P <sub>DISS</sub>   |       |      | 1500     | mW    |       |
| Transmitter                    |                      |                     |       |      |          |       |       |
| Input Differential Impedance   |                      | Z <sub>IN</sub>     |       | 100  |          | Ω     |       |
| Differential Data Input Swing  |                      | V <sub>IN,pp</sub>  | 180   |      | 700      | mVp-p |       |
| Tx_Fault                       | Transmitter Fault    | VOH                 | 2.0   |      | Host_Vcc | V     |       |
|                                | Normal Operation     | VOL                 | 0     |      | 0.8      | V     |       |
| Tx_Disable                     | Transmitter Disable  | VIH                 | 2.0   |      | Host_Vcc | V     |       |
|                                | Transmitter Enable   | VIL                 | 0     |      | 0.8      | V     |       |
| Receiver                       |                      |                     |       |      |          |       |       |
| Output Differential Impedance  |                      | Z <sub>OUT</sub>    |       | 100  |          | Ω     |       |
| Differential Data Output Swing |                      | V <sub>OUT,pp</sub> | 300   |      | 850      | mVp-p | 1     |
| Data Output Rise/Fall Time     |                      | Tr/Tf               |       |      | 15       | ps    | 2     |
| Rx_LOS                         | Loss of Signal (LOS) | VOH                 | 2.0   |      | Host_Vcc | V     | 3     |
|                                | Normal Operation     | VOL                 | 0     |      | 0.8      | V     | 3     |

## Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. 20-80%.
3. LOS is an open collector output and should be pulled up with 4.7kΩ on the host board.

## Optical Characteristics

| Parameter                         | Symbol          | Min. | Typ. | Max. | Unit | Notes |
|-----------------------------------|-----------------|------|------|------|------|-------|
| Transmitter                       |                 |      |      |      |      |       |
| Launch Optical Power              | Po              | 0    |      | 5    | dBm  | 1     |
| Center Wavelength Range           | $\lambda_C$     | 1260 | 1270 | 1280 | nm   |       |
| Extinction Ratio                  | ER              | 3.5  |      |      | dB   | 2     |
| Spectral Width (-20dB)            | $\Delta\lambda$ |      |      | 1    | nm   |       |
| Side-Mode Suppression Ratio       | SMSR            | 30   |      |      | dB   |       |
| Optical Rise/Fall Time @25.78Gbps | Tr/Tf           | 15   |      |      | ps   | 3     |
| Optical Return Loss Tolerance     | ORLT            |      |      | 12   | dB   |       |
| POUT @Tx_Disable Asserted         | Poff            |      |      | -30  | dBm  | 1     |
| Receiver                          |                 |      |      |      |      |       |
| Center Wavelength                 | $\lambda_C$     | 1320 | 1330 | 1340 | nm   |       |
| Receiver OMA Sensitivity          | RxSENS1         |      |      | -18  | dBm  | 4     |
| Receiver OMA Sensitivity          | RxSENS2         |      |      | -14  | dBm  | 5     |
| Receiver Overload (Pavg)          | POL             | -3   |      |      | dBm  |       |
| Optical Return Loss               | ORL             | 26   |      |      | dB   |       |
| LOS De-Assert                     | LOSD            |      |      | -19  | dBm  |       |
| LOS Assert                        | LOSA            | -35  |      |      | dBm  |       |
| LOS Hysteresis                    |                 | 0.5  |      |      | dB   |       |

### Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Unfiltered, 20-80%.
4. Measured with PRBS  $2^{31}-1$  at  $5 \times 10^{-5}$  BER.
5. Measured with PRBS  $2^{31}-1$  at  $1 \times 10^{-12}$  BER.

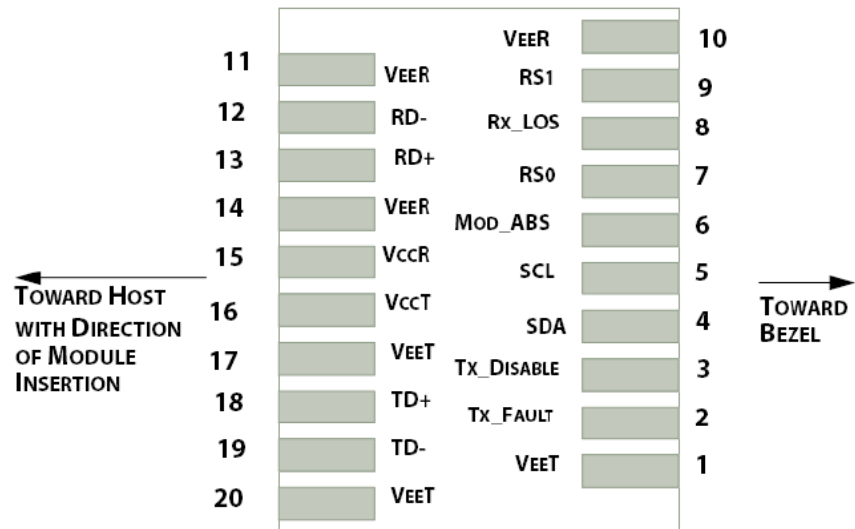
## Pin Descriptions

| Pin | Symbol     | Name/Description                                                          | Notes |
|-----|------------|---------------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground.                                                       | 1     |
| 2   | Tx_Fault   | Transmitter Fault. LVTTTL-O. "High" indicates a fault condition.          | 2     |
| 3   | Tx_Disable | Transmitter Disable. LVTTTL-I. "High" or "open" disables the transmitter. | 3     |
| 4   | SDA        | 2-Wire Serial Interface Data. LVCMOS-I/O. MOD-DEF2.                       | 4     |
| 5   | SCL        | 2-Wire Serial Interface Clock. LVCMOS-I/O. MOD-DEF1.                      | 4     |
| 6   | MOD_ABS    | Module Absent (Output). Connected to the VeeT or VeeR in the module.      | 5     |
| 7   | RS0        | N/A.                                                                      | 6     |
| 8   | Rx_LOS     | Receiver Loss of Signal. LVTTTL-O.                                        | 2     |
| 9   | RS1        | N/A.                                                                      | 6     |
| 10  | VeeR       | Receiver Ground.                                                          | 1     |
| 11  | VeeR       | Receiver Ground.                                                          | 1     |
| 12  | RD-        | Receiver Inverted Data Out. CML-O.                                        |       |
| 13  | RD+        | Receiver Data Out. CML-O.                                                 |       |
| 14  | VeeR       | Receiver Ground.                                                          |       |
| 15  | VccR       | +3.3V Receiver Power Supply.                                              |       |
| 16  | VccT       | +3.3V Transmitter Power Supply.                                           |       |
| 17  | VeeT       | Transmitter Ground.                                                       | 1     |
| 18  | TD+        | Transmitter Data In. CML-I.                                               |       |
| 19  | TD-        | Transmitter Inverted Data In. CML-I.                                      |       |
| 20  | VeeT       | Transmitter Ground.                                                       | 1     |

### Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that, on the host board, requires a 4.7kΩ to 10kΩ pull-up resistor to the Host\_Vcc.
3. This input is internally biased "high" with a 4.7kΩ to 10kΩ pull-up resistor to the VccT.
4. 2-Wire Serial Interface Clock and Data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that, on the host board, requires a 4.7kΩ to 10kΩ pull-up resistor to the Host\_Vcc.
6. Rate Select can also be set through the 2-wire bus in accordance with SFF-8472 v.12.1m. Rx Rate Select is set at Bit 3, Byte 110, and Address A2h. Tx Rate Select is set at Bit 3, Byte 118, and Address A2h.

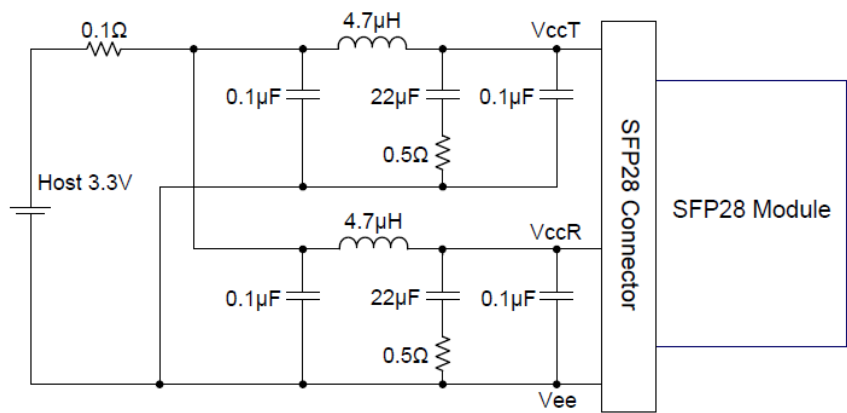
## Pin Assignments



## Block Diagram of Transceiver



Power Supply Filter Network



Mechanical Specifications



## **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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