



### **SFP-25GB-BX-D-20-CN2-OPC**

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

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex 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 Ciena® compatible SFP28 transceiver provides 25GBase-BX throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx 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 Ciena®. 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           | $\lambda_C$     | 1320 | 1330 | 1340 | 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                 | $\lambda_C$     | 1260 | 1270 | 1280 | 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.

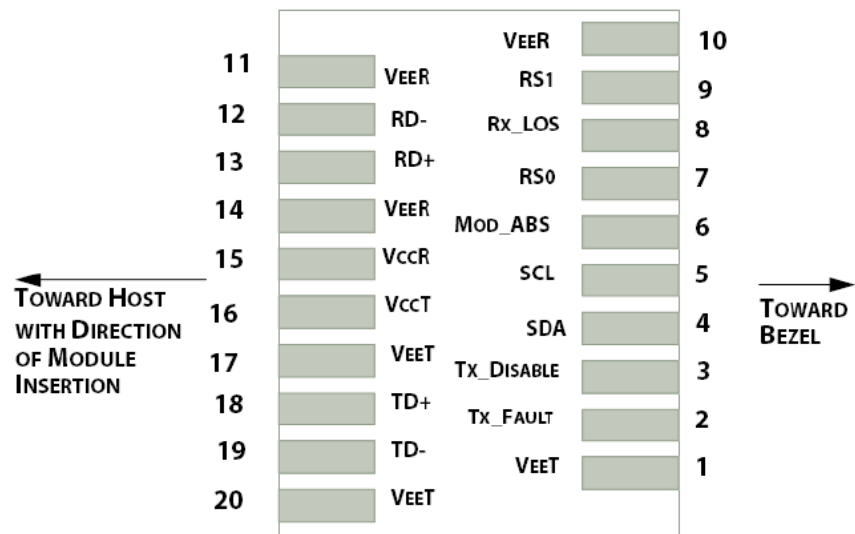
## Pin Descriptions

| 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     |

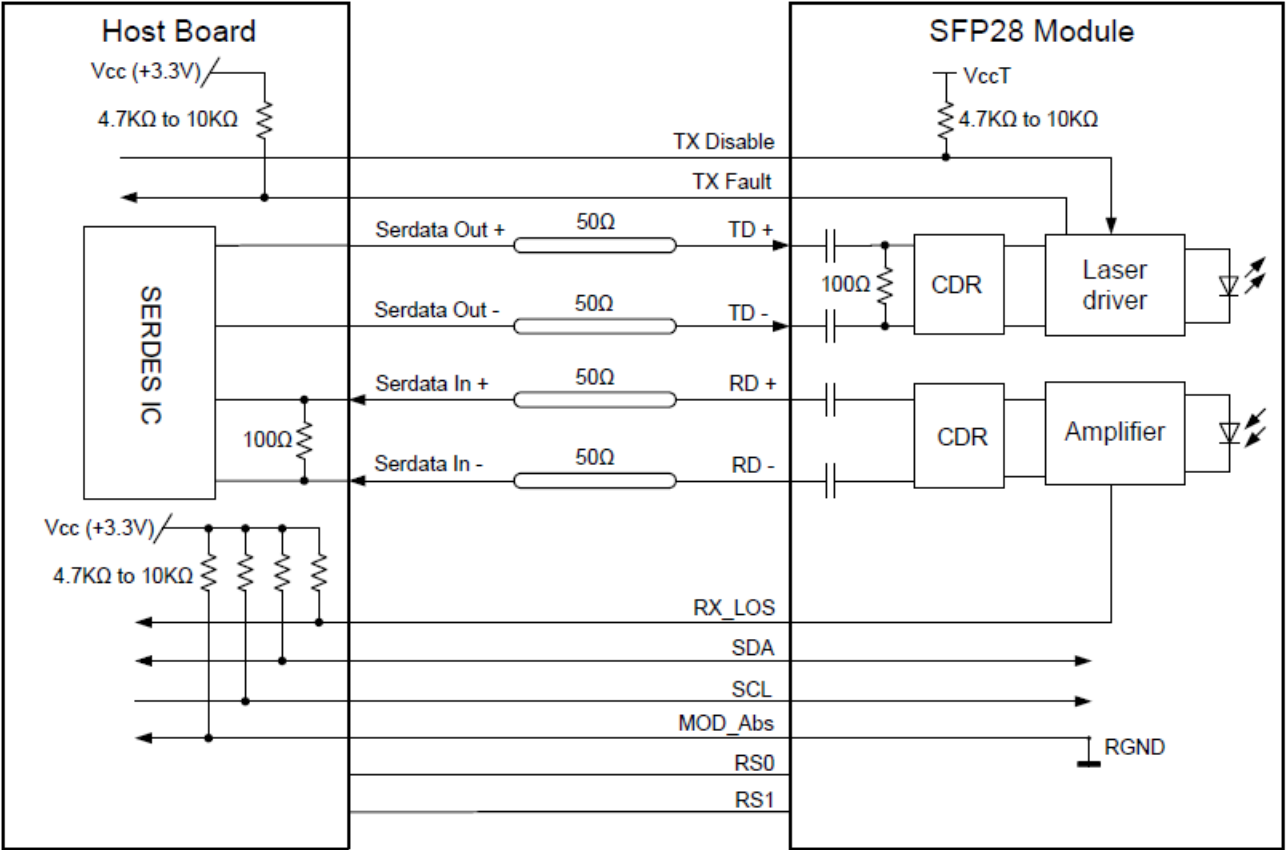
### Notes:

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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