



### 407-BCBF-OPC

Dell® 407-BCBF Compatible TAA 25GBase-SR SFP28 Transceiver (MMF, 850nm, 100m, LC, DOM)

#### Features

- SFF-8402 and SFF-8472 Compliance
- Duplex LC Connector
- Multi-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 Dell® 407-BCBF compatible SFP28 transceiver provides 25GBase-SR throughput up to 100m over multi-mode fiber (MMF) using a wavelength of 850nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Dell® 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.

OptioConnect's 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 |
|----------------------------|--------|------|------|-----|------|
| Storage Temperature        | Ts     | -40  |      | 85  | °C   |
| Relative Humidity          | RH     | 5    |      | 95  | %    |
| Supply Voltage             | Vcc    | -0.5 |      | 4.0 | V    |
| Operating Case Temperature | Tc     | 0    | 25   | 70  | °C   |

## Electrical Characteristics

| Parameter                         |                      | Symbol                | Min   | Typ   | Max             | Unit              | Notes      |
|-----------------------------------|----------------------|-----------------------|-------|-------|-----------------|-------------------|------------|
| Supply Voltage                    |                      | Vcc                   | 3.135 | 3.3   | 3.465           | V                 |            |
| Data Rate                         |                      |                       |       | 25.78 |                 | GB/s              |            |
| Module Supply Current             |                      | Icc                   |       |       | 290             | mA                |            |
| Power Dissipation                 |                      | P <sub>D</sub>        |       |       | 1000            | mW                |            |
| Transmitter                       |                      |                       |       |       |                 |                   |            |
| Input Differential Impedance      |                      | Z <sub>IN</sub>       |       | 100   |                 | Ω                 |            |
| Differential Data Input Swing     |                      | V <sub>IN, P-P</sub>  | 180   |       | 700             | mV <sub>P-P</sub> |            |
| TX_FAULT                          | Transmitter Fault    | V <sub>OH</sub>       | 2.0   |       | V <sub>CC</sub> | V                 | TX_FAULT   |
|                                   | Normal Operation     | V <sub>OL</sub>       | 0     |       | 0.8             | V                 |            |
| TX_DISABLE                        | Transmitter Disable  | V <sub>IH</sub>       | 2.0   |       | V <sub>CC</sub> | V                 | TX_DISABLE |
|                                   | Transmitter Enable   | V <sub>IL</sub>       | 0     |       | 0.8             | V                 |            |
| Receiver                          |                      |                       |       |       |                 |                   |            |
| Output Differential Impedance     |                      | Z <sub>O</sub>        |       | 100   |                 | Ω                 |            |
| Differential Data Output Swing    |                      | V <sub>OUT, P-P</sub> | 300   |       | 850             | mV <sub>P-P</sub> | 1          |
| Data Output Rinse Time, Fall Time |                      | tr, tf                |       | 30    |                 | Ps                | 2          |
| Rx_LOS                            | Loss of Signal (LOS) | V <sub>OH</sub>       | 2.0   |       | V <sub>CC</sub> | V                 | RX_LOS     |
|                                   | Normal Operation     | V <sub>OL</sub>       | 0     |       | 0.8             | V                 |            |

## Notes:

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

## Optical Characteristics

| Parameter                                 | Symbol           | Min  | Typ | Max  | Unit | Notes |
|-------------------------------------------|------------------|------|-----|------|------|-------|
| Transmitter                               |                  |      |     |      |      |       |
| Launch Optical Power                      | P <sub>o</sub>   | -7.6 |     | +2.4 | dBm  | 1     |
| Extinction Ratio                          | ER               | 2    |     |      | dB   |       |
| Center Wavelength Range                   | $\lambda_c$      | 840  | 850 | 860  | nm   |       |
| Transmitter Dispersion Penalty @25.78Gb/s | TWDP             |      |     | 5    | dB   |       |
| Spectral Width (RMS) @25.78Gb/s           | $\Delta\lambda$  |      |     | 0.6  | nm   |       |
| Optical Return Loss Tolerance             | ORLT             |      |     | 12   | dB   |       |
| P <sub>out</sub> @TX-Disable Asserted     | P <sub>OFF</sub> |      |     | -30  | dBm  | 1     |
| Receiver                                  |                  |      |     |      |      |       |
| Center Wavelength                         | $\lambda_c$      | 840  |     | 860  | nm   |       |
| Receiver Sensitivity (P avg)              | S                |      |     | -11  | dBm  | 2     |
| Receiver Overload (P avg)                 | P <sub>OL</sub>  | 2.5  |     |      | dBm  |       |
| Optical Return Loss                       | ORL              | 12   |     |      | dB   |       |
| LOS De-Assert                             | LOS <sub>D</sub> |      |     | -12  | dBm  |       |
| LOS Assert                                | LOS <sub>A</sub> | -30  |     |      | dBm  |       |
| LOS Hysteresis                            |                  | 0.5  |     |      | dB   |       |

### Notes:

1. 50/125 $\mu$ m fiber with NA = 0.2, 62.5/125 $\mu$ m fiber with NA = 0.275.
2. Measured with PRBS 231-1 at 10<sup>-4</sup> BER @25.78Gb/s.

## Pin Descriptions

| Pin | Symbol     | Name/Descriptions                                                     | Ref. |
|-----|------------|-----------------------------------------------------------------------|------|
| 1   | VeeT       | Transmitter Ground                                                    | 1    |
| 2   | TX Fault   | Transmitter Fault (LVTTL-O) - High indicates a fault condition        | 2    |
| 3   | TX Disable | Transmitter Disable (LVTTL-I) – High or open disables the transmitter | 3    |
| 4   | SDA        | Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)           | 4    |
| 5   | SCL        | Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)          | 4    |
| 6   | MOD_ABS    | Module Absent (Output), connected to VeeT or VeeR in the module       | 5    |
| 7   | RS0        | Rate Select 0 – Not used, Presents high input impedance               | 6    |
| 8   | RX_LOS     | Receiver Loss of Signal (LVTTL-O)                                     | 2    |
| 9   | RS1        | Rate Select 1 – Not used, Presents high input impedance               | 6    |
| 10  | VeeR       | Receiver Ground                                                       | 1    |
| 11  | VeeR       | Receiver Ground                                                       | 1    |
| 12  | RD-        | Inverse Received Data out (CML-O), AC Coupled                         |      |
| 13  | RD+        | Received Data out (CML-O), AC Coupled                                 |      |
| 14  | VeeR       | Receiver Ground                                                       |      |
| 15  | VccR       | Receiver Power - +3.3V                                                |      |
| 16  | VccT       | Transmitter Power - +3.3 V                                            |      |
| 17  | VeeT       | Transmitter Ground                                                    | 1    |
| 18  | TD+        | Transmitter Data In (CML-I), AC Coupled                               |      |
| 19  | TD-        | Inverse Transmitter Data In (CML-I), AC Coupled                       |      |
| 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 hostboard requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. Two-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 VccHost.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 10.2, Rx Rate Select is set at Bit 3, Byte 110.  
Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.  
Note: writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

Host PCB SFP+ pad assignment top view



Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



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.

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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

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