



### **SFP-1M-BX-D-SC-OPC**

MSA and TAA Compliant 100Base-BX SFP Transceiver (SMF, 1550nmTx/1310nmRx, 20km, SC, DOM)

#### **Features**

- INF-8074 and SFF-8472 Compliance
- Simplex SC 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:**

- 100Base

#### **Product Description**

This MSA compliant SFP transceiver provides 100Base-BX throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1550nmTx/1310nmRx via an SC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.

## Absolute Maximum Ratings

| Parameter                   | Symbol           | Min. | Typ. | Max. | Unit | Notes |
|-----------------------------|------------------|------|------|------|------|-------|
| Maximum Supply Voltage      | V <sub>cc</sub>  | -0.5 |      | 3.6  | V    |       |
| Storage Temperature         | T <sub>stg</sub> | -40  |      | 85   | °C   |       |
| Operating Case Temperature  | T <sub>c</sub>   | 0    |      | 70   | °C   |       |
| Operating Relative Humidity | RH               | 5    |      | 85   | %    |       |
| Power Supply Current        | I <sub>cc</sub>  |      |      | 300  | mA   |       |
| Data Rate                   |                  |      | 155  |      | Mbps |       |

## Electrical Characteristics

| Parameter                     |         | Symbol           | Min. | Typ. | Max.                 | Unit  | Notes |
|-------------------------------|---------|------------------|------|------|----------------------|-------|-------|
| Supply Voltage                |         | V <sub>cc</sub>  | 3.13 | 3.3  | 3.45                 | V     |       |
| 9μm Core Diameter SMF         |         | L                |      | 20   |                      | km    |       |
| Transmitter                   |         |                  |      |      |                      |       |       |
| LVPECL Differential Inputs    |         | V <sub>IN</sub>  | 400  |      | 2000                 | mVp-p | 1     |
| Input Differential Impedance  |         | Z <sub>IN</sub>  | 85   | 100  | 115                  | Ω     | 2     |
| Tx_Disable                    | Disable |                  | 2    |      | V <sub>cc</sub> +0.3 | V     |       |
|                               | Enable  |                  | 0    |      | 0.8                  | V     |       |
| Tx_Fault                      | Fault   |                  | 2    |      | V <sub>cc</sub> +0.3 | V     |       |
|                               | Normal  |                  | 0    |      | 0.5                  | V     |       |
| Receiver                      |         |                  |      |      |                      |       |       |
| LVPECL Differential Outputs   |         | V <sub>OUT</sub> | 400  |      | 2000                 | mVp-p | 3     |
| Output Differential Impedance |         | Z <sub>OUT</sub> | 85   | 100  | 115                  | Ω     |       |
| Tx_Disable Assert Time        |         | t <sub>off</sub> |      |      | 10                   | us    |       |
| Rx_LOS                        | LOS     |                  | 2    |      | V <sub>cc</sub> +0.3 | V     |       |
|                               | Normal  |                  | 0    |      | 0.8                  | V     |       |
| MOD_DEF(0:2)                  |         | V <sub>OH</sub>  | 2.5  |      |                      | V     | 4     |
|                               |         | V <sub>OL</sub>  | 0    |      | 0.5                  | V     | 4     |

## Notes:

1. AC coupled inputs. LVPECL logic. Internally AC coupled.
2. R<sub>IN</sub>>100kΩ @ DC.
3. AC coupled outputs. LVPECL logic. Internally AC coupled.
4. With serial ID.

## Optical Characteristics

| Parameter                  | Symbol                | Min. | Typ. | Max. | Unit | Notes |
|----------------------------|-----------------------|------|------|------|------|-------|
| Transmitter                |                       |      |      |      |      |       |
| Center Wavelength          | $\lambda_C$           | 1530 | 1550 | 1570 | nm   |       |
| Spectral Width (-20dB)     | $\Delta\lambda$       |      |      | 4    | nm   |       |
| Average Output Power       | POUT                  | -15  |      | -8   | dBm  | 1     |
| Extinction Ratio           | ER                    | 8.2  |      |      | dB   | 2     |
| Rise/Fall Time (20-80%)    | Tr/Tf                 |      |      | 3    | ns   |       |
| POUT @ Tx_Disable Asserted | POUT                  |      |      | -45  | dBm  |       |
| Total Jitter               | TJ                    |      |      | 0.43 | UI   |       |
| Output Optical Eye         | IUT-T G.957 Complaint |      |      |      |      | 2     |
| Receiver                   |                       |      |      |      |      |       |
| Wavelength Range           | $\lambda_C$           | 1260 | 1310 | 1360 | nm   |       |
| Receiver Sensitivity       | Pmin                  |      |      | -32  | dBm  | 3     |
| Receiver Overload          | Pmax                  | -8   |      |      | dBm  |       |
| LOS De-Assert              | LOSD                  |      |      | -35  | dBm  |       |
| LOS Assert                 | LOSA                  | -45  |      |      | dBm  |       |
| LOS Hysteresis             |                       | 1    |      |      | dB   | 3     |

### Notes:

1. Output power is coupled into a 9/125 $\mu$ m SMF.
2. Filtered, measured with a PRBS  $2^7-1$  test pattern @155Mbps.
3. Minimum average optical power is measured at BER less than  $1E^{-12}$ , with  $2^7-1$  PRBS and ER=8.2dB.

## Pin Descriptions

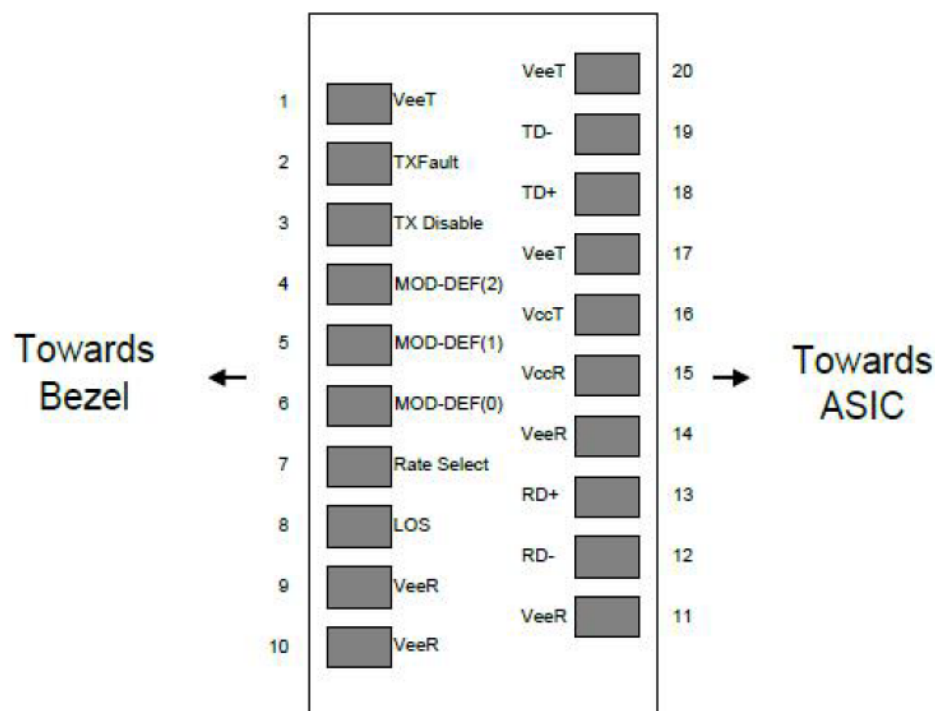
| Pin | Symbol      | Name/Description                                          | Plug Seq. | Notes |
|-----|-------------|-----------------------------------------------------------|-----------|-------|
| 1   | VeeT        | Transmitter Ground.                                       | 1         | 5     |
| 2   | Tx_Fault    | Transmitter Fault Indication.                             | 3         | 1     |
| 3   | Tx_Disable  | Transmitter Disable. Module disables on "high" or "open." | 3         | 2     |
| 4   | MOD_DEF2    | Module Definition 2. 2-Wire Serial ID Interface.          | 3         | 3     |
| 5   | MOD_DEF1    | Module Definition 1. 2-Wire Serial ID Interface.          | 3         | 3     |
| 6   | MOD_DEF0    | Module Definition 0. Grounded within the module.          | 3         | 3     |
| 7   | Rate Select | Not Connected. Function not available.                    | 3         |       |
| 8   | LOS         | Loss of Signal.                                           | 3         | 4     |
| 9   | VeeR        | Receiver Ground.                                          | 1         | 5     |
| 10  | VeeR        | Receiver Ground.                                          | 1         | 5     |
| 11  | VeeR        | Receiver Ground.                                          | 1         | 5     |
| 12  | RD-         | Inverse Received Data Out.                                | 3         | 6     |
| 13  | RD+         | Received Data Out.                                        | 3         | 7     |
| 14  | VeeR        | Receiver Ground.                                          | 1         | 5     |
| 15  | VccR        | 3.3±5% Receiver Power.                                    | 2         | 7     |
| 16  | VccT        | 3.3±5% Transmitter Power.                                 | 2         | 7     |
| 17  | VeeT        | Transmitter Ground.                                       | 1         | 5     |
| 18  | TD+         | Transmitter Data In.                                      | 3         | 8     |
| 19  | TD-         | Inverse Transmitter Data In.                              | 3         | 8     |
| 20  | VeeT        | Transmitter Ground.                                       | 1         | 5     |

## Notes:

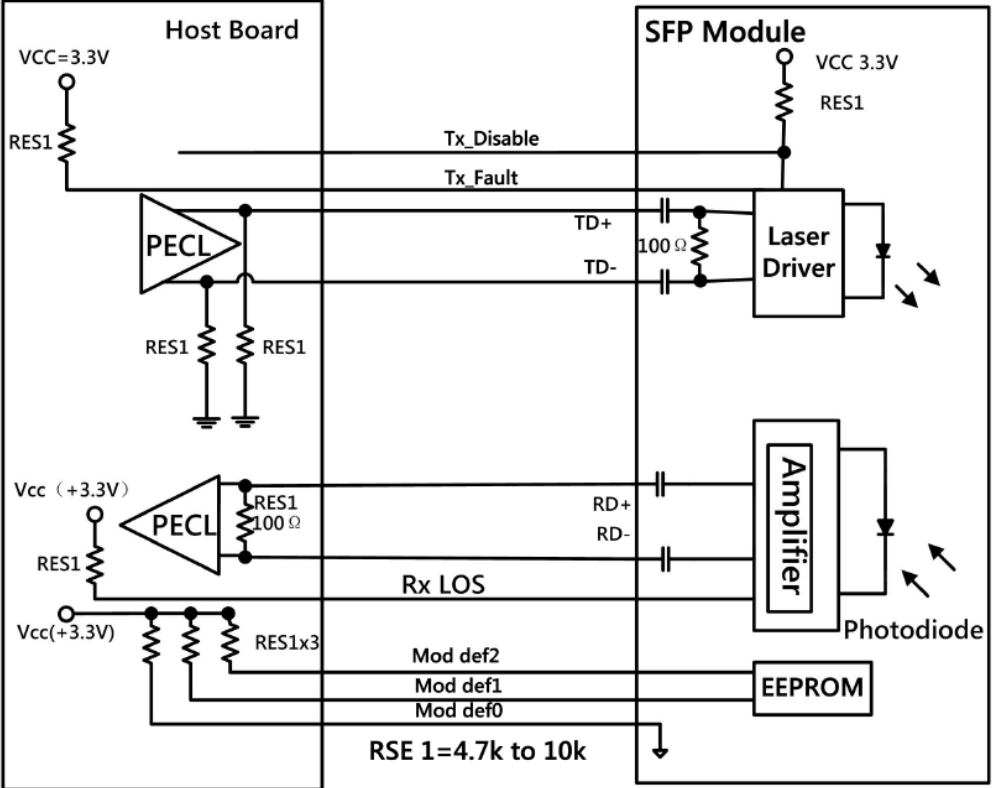
1. Tx\_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. Pull-up voltage between 2.0V and VccT/R+0.3V. When "high," output indicates a laser fault of some kind. "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.
2. Tx\_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:
  - Low (0V – 0.8V): Transmitter On.
  - (>0.8V and <2.0V): Undefined.
  - High (2.0V – 3.465V): Transmitter Disabled.
  - Open: Transmitter Disabled.
3. MOD\_DEF0, 1, & 2. These are the module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
  - MOD\_DEF0 is grounded by the module to indicate that the module is present.
  - MOD\_DEF1 is the clock line of the 2-wire serial interface for optional serial ID.
  - MOD\_DEF2 is the data line of the 2-wire serial interface for optional serial ID.

4. LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7k $\Omega$  to 10k $\Omega$  resistor. Pull-up voltage between 2.0V and  $V_{ccT}/R+0.3V$ . When "high," this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.
5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled 100 $\Omega$  differential lines which should be terminated with 100 $\Omega$  (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 400mV and 2000mV differential (200mV and 1000mV single-ended) when properly terminated.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V $\pm$ 5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 $\Omega$  should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot-plugging of the SFP transceiver module will result in an in-rush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 400mV to 2000mV (200mV to 1000mV single-ended).

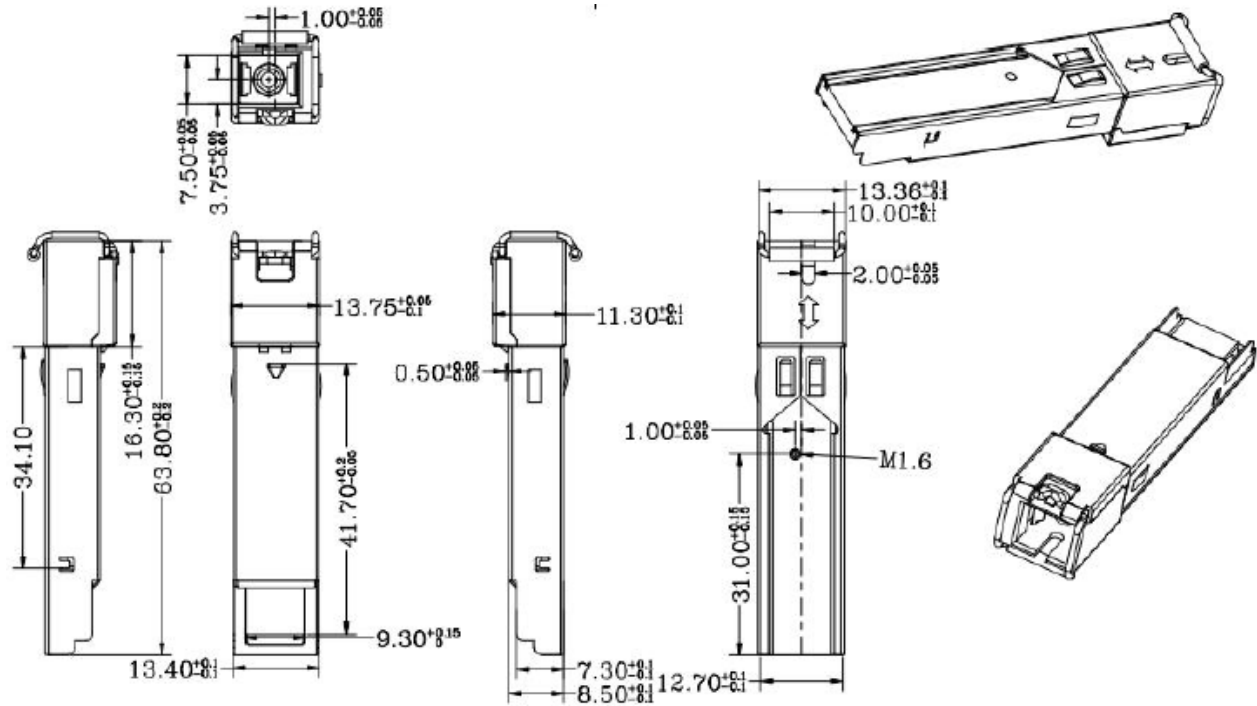
## Pin Connectors



Recommended Application Interface Circuit



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.

[www.optioconnect.com](http://www.optioconnect.com) | [info@optioconnect.com](mailto:info@optioconnect.com)

