



## SFP-1GB-BX34-U-20-SC-SKY

MSA and 1000Base-BX SFP Transceiver (SMF, 1310nmTx/1490nmRx, 20km, SC, DOM)

### Product Description

This MSA compliant SFP transceiver provides 1000Base-BX throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1310nmTx/1490nmRx via an SC 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. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

### Features:

- Compliant with SFF-8472
- Up to 20km Reach with 9/125µm SMF
- Operating Data Rate up to 1.25Gbps
- Hot-Pluggable SFP Footprint
- SC Connector Interface
- Single 3.3V Power Supply
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications:

- 1000Base-BX Ethernet
- Access (FTTx) and Enterprise
- 1x Fibre Channel

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### **ESD**

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### **LASER SAFETY**

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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## Absolute Maximum Ratings

| Parameter             |     | Symbol | Min. | Typ.  | Max. | Unit | Notes |
|-----------------------|-----|--------|------|-------|------|------|-------|
| Operating Temperature |     | Tc     | 0    |       | 70   | °C   |       |
| Storage Temperature   |     | Tstg   | -40  |       | 85   | °C   |       |
| Supply Voltage        |     | Vcc    | -0.5 |       | 3.6  | V    |       |
| Relative Humidity     |     | RH     | 5    |       | 85   | %    |       |
| 9µm Core Diameter MMF |     | L      |      | 20    |      | km   |       |
| Data Rate             | GBE |        |      | 1.25  |      | Gbps |       |
|                       | FC  |        |      | 1.063 |      |      |       |

## Electrical Characteristics

| Parameter                     |         | Symbol | Min. | Typ. | Max.    | Unit  | Notes |
|-------------------------------|---------|--------|------|------|---------|-------|-------|
| Supply Voltage                |         | Vcc    | 3.13 | 3.3  | 3.47    | V     |       |
| Supply Current                |         | Icc    |      |      | 300     | mA    |       |
| Transmitter                   |         |        |      |      |         |       |       |
| LVPECL Differential Inputs    |         | VIN    | 400  |      | 1800    | mVp-p | 1     |
| Input Differential Impedance  |         | ZIN    | 90   | 100  | 110     | Ω     | 2     |
| Tx_Disable                    | Disable |        | 2    |      | Vcc+0.3 | V     |       |
|                               | Enable  |        | 0    |      | 0.8     |       |       |
| Tx_Fault                      | Fault   |        | 2    |      | Vcc+0.3 | V     |       |
|                               | Normal  |        | 0    |      | 0.8     |       |       |
| Receiver                      |         |        |      |      |         |       |       |
| LVPECL Differential Outputs   |         | VOUT   | 400  |      | 2000    | mVp-p |       |
| Output Differential Impedance |         | ZOUT   | 90   | 100  | 110     | Ω     |       |
| Tx_Disable Assert Time        |         | T_off  |      |      | 10      | µs    |       |
| Rx_LOS                        | LOS     |        | 2    |      |         | V     |       |
|                               | Normal  |        | 0    |      |         |       |       |
| MOD_DEF(0.2)                  |         | VOH    | 2.5  |      |         | V     |       |
|                               |         | VOL    | 0    |      |         |       |       |

## Notes:

1. AC coupled inputs. LVPECL logic. Internally AC coupled.
2. RIN > 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           | $\lambda_C$     | 1290                      | 1310 | 1330 | nm   |       |
| Spectral Width (-20dB)      | $\Delta\lambda$ |                           |      | 1    | nm   |       |
| Spectral Width (RMS)        | $\Delta\lambda$ |                           |      | 4    | nm   |       |
| Side-Mode Suppression Ratio | SMSR            | 30                        |      |      | dB   |       |
| Average Output Power        | Pavg            | -9                        |      | -3   | dBm  | 1     |
| Extinction Ratio            | ER              | 9                         |      |      | dB   |       |
| Rise/Fall Time (20-80%)     | Tr/Tf           |                           |      | 0.26 | ns   |       |
| Total Jitter                | TJ              |                           |      | 0.43 | UI   |       |
| POUT @Tx_Disable Asserted   | POUT            |                           |      | -35  | dBm  |       |
| Output Optical Eye          |                 | Compliant with IEEE 802.3 |      |      |      | 2     |
| Receiver                    |                 |                           |      |      |      |       |
| Center Wavelength           | $\lambda_C$     | 1450                      | 1490 | 1540 | nm   |       |
| Receiver Sensitivity        | Pmin            |                           |      | -24  | dBm  | 3     |
| Receiver Overload           | Pmax            | -3                        |      |      | dBm  |       |
| LOS De-Assert               | LOSD            |                           |      | -25  | dBm  |       |
| LOS Assert                  | LOSA            | -35                       |      |      | dBm  |       |
| LOS Hysteresis              |                 | 1                         |      | 4    | dB   | 3     |

### Notes:

1. Output power is power coupled into a 9/125 $\mu$ m single-mode fiber.
2. Filtered, measured with a PRBS 2<sup>7</sup>-1 test pattern @1250Mbps.
3. Minimum average optical power is measured at BER less than 1E<sup>-12</sup> with a 2<sup>7</sup>-1 PRBS and ER=9dB.

## Pin Descriptions

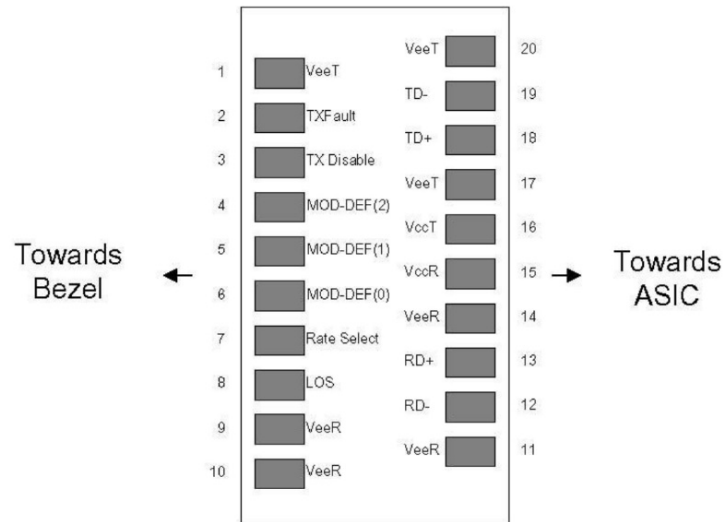
| Pin | Symbol      | Name/Description                                          | Plug Seq. | Notes |
|-----|-------------|-----------------------------------------------------------|-----------|-------|
| 1   | VeeT        | Transmitter Ground.                                       | 1         | 5     |
| 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 Used.                                                 | 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         |       |
| 13  | RD+         | Received Data Out.                                        | 3         | 6     |
| 14  | VeeR        | Receiver Ground.                                          | 1         | 5     |
| 15  | VccR        | +3.3V $\pm$ 5% Receiver Power.                            | 2         | 6     |
| 16  | VccT        | +3.3V $\pm$ 5% Transmitter Power.                         | 2         | 6     |
| 17  | VeeT        | Transmitter Ground.                                       | 1         | 5     |
| 18  | TD+         | Transmit Data In.                                         | 3         |       |
| 19  | TD-         | Inverse Transmit Data In.                                 | 3         |       |
| 20  | VeeT        | Transmitter Ground.                                       | 1         | 5     |

### Notes:

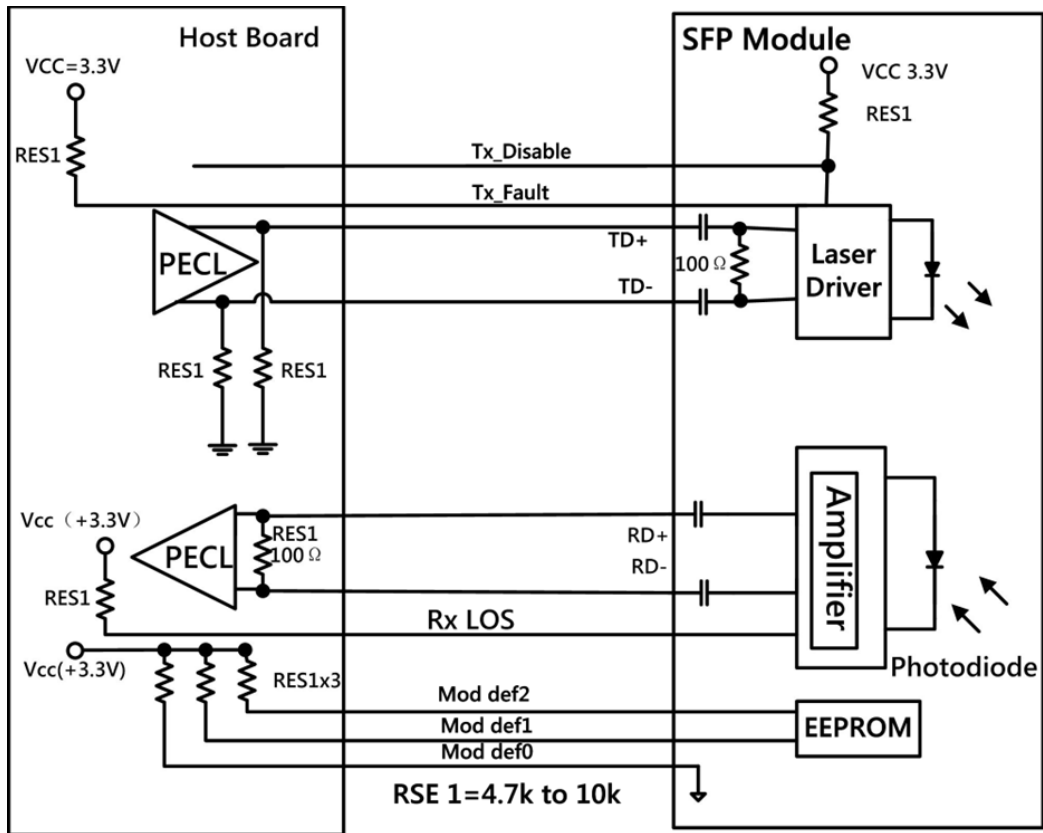
1. Tx\_Fault is an open collector output that should be pulled up with a 4.7k $\Omega$  to 10k $\Omega$  resistor on the host board. When “high,” this output indicates a laser fault of some kind. “Low” indicates normal operation.
2. Tx\_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k $\Omega$  to 10k $\Omega$  resistor. Its states are:
  - Low (0V to 0.8V): Transmitter On
  - (>0.8V and <2V): Undefined
  - High (2.0V to 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 4.7k $\Omega$  to 10k $\Omega$  resistor on the host board.
  - 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 which should be pulled up externally with a 4.7k $\Omega$  to 10k $\Omega$  resistor. When “high,” this output indicates that the received optical power is below the worst-case receiver sensitivity. “Low” indicates normal operation.

5. VeeR and VeeT may be internally connected within the SFP module.
6. 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. VccR and VccT may be internally connected within the SFP transceiver module.

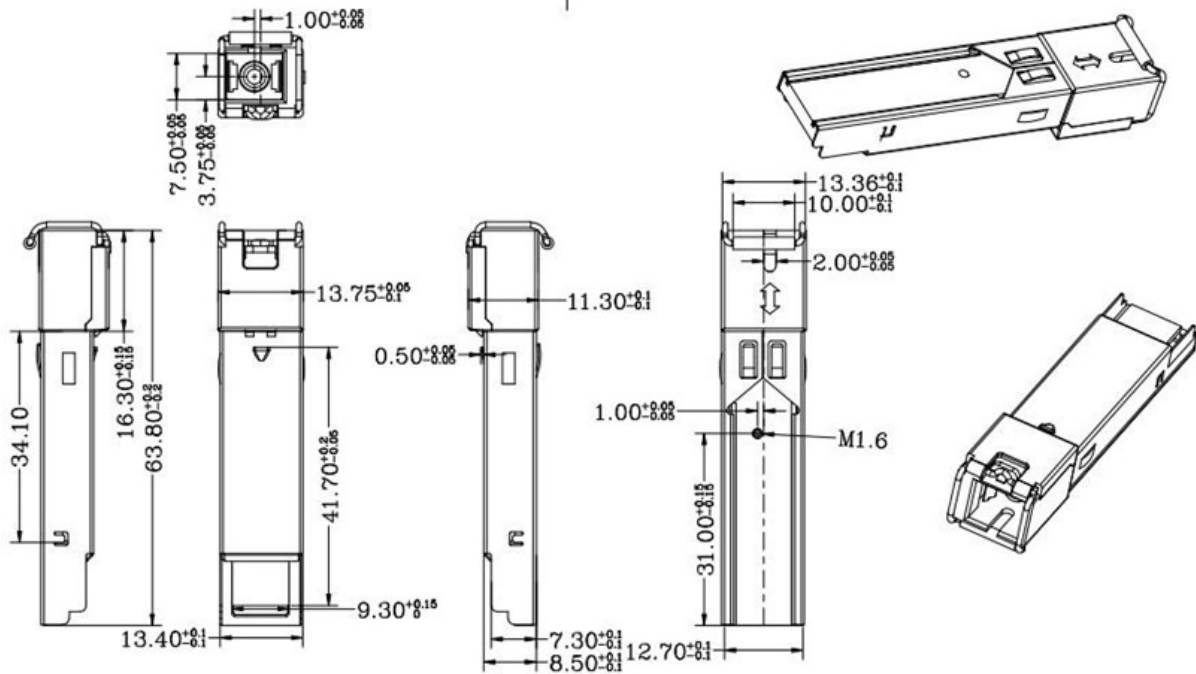
### Host Board Connector



### Recommended Application Interface Circuit



## Mechanical Specifications



# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

