

# SBD71120GExx – SFP Single Upstream Transceiver

## Tx 1570nm & Rx 1510nm / 120km / Gigabit Ethernet

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.

## 1. Overview

SBD71120GExx is a high performance transceiver module for Gigabit Ethernet data links over one single mode fibre. The maximum reach is 120km, for a 33dB end of life (EOL) power budget. The emitter is a 1570nm DFB laser, the receiver a 1510nm APD photodiode. Consequently, a module with a 1510nm emitter and a 1570nm receiver is required at the opposite side of the link. The recommended counterpart is SBU17120GExx.

This transceiver module is compliant with the Small Form-factor Pluggable (SFP) Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

## 2. Features

- SFP Multi-Source Agreement compliant [INF-8074]
- Hot pluggable SFP footprint
- Serial ID functionality supported according to [SFF-8472]
- Class 1 laser safety standard IEC 60825 compliant
- Single LC or SC connector
- 1570nm DFB transmitter, 1510nm APD receiver
- 120km point-to-point transmission on single mode fibre
- Gigabit Ethernet compliant
- 1x Fibre Channel compatible
- Operating temperature range 0°C to 70°C or -20°C to 85°C
- Low power dissipation (<1W)
- Digital diagnostics monitoring (DDM)

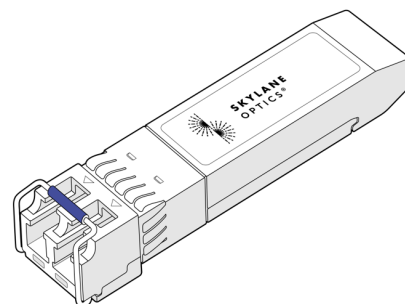


Figure 1. SFP Single Fiber (non-binding illustration)

## 3. Applications

- FTTx
- Gigabit Ethernet
- Storage

## 4. Optical Interface

| P/N          | Wavelength [nm]          | Output Optical Power <sup>2</sup> [dBm] | Optical Receiver Sensitivity <sup>3</sup> [dBm] | Optical Receiver Overload <sup>4</sup> [dBm] | Power Budget <sup>2</sup> [dB] |
|--------------|--------------------------|---|---|--|--------------------------------|
| SBD71120GExx | Tx 1570 nm<br>Rx 1510 nm | 0 to 5                                  | ≤ -33   | -8   | ≥ 33                           |

1. Distance is estimated assuming typical optical losses after decent quality fiber deployment; Only optical budget value is guaranteed.

2. EOL, over operating temperature range

3. Measured with 1.25Gbps PRBS 2<sup>7</sup>-1, ER=9dB, BER≤10<sup>-12</sup>

4. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers (optical loop back) before ensuring that proper optical attenuation is used.

## 5. Technical Parameters

### 5.1. Recommended Operating Conditions

| Parameter                  | Min  | Typ | Max  | Unit | Notes                      |
|----------------------------|------|-----|------|------|----------------------------|
| Storage temperature        | -40  |     | 85   | °C   |                            |
| Operating Case Temperature | 0    |     | 70   | °C   | SBD71120GE0x, SBD71120GE3x |
|                            | -20  |     | 85   | °C   | SBD71120GE1x, SBD71120GE4x |
| Relative Humidity          | 5    |     | 95   | %    | Non condensing             |
| Power Supply Voltage       | 3.15 | 3.3 | 3.45 | V    |                            |
| Power Supply Current       |      |     | 300  | mA   |                            |

### 5.2. Transmitter Optical Specifications

| Parameter                   | Min  | Typ  | Max    | Unit | Notes |
|-----------------------------|------|------|--------|------|-------|
| Average Output Power        | 0    |      | 5      | dBm  | 5     |
| Center Wavelength           | 1564 | 1570 | 1577.5 | nm   |       |
| Optical Extinction Ratio ER | 9    |      |        | dB   |       |
| Spectral Width              |      |      | 1      | nm   |       |

5. Output power coupled into a 9/125 μm single-mode fibre

### 5.3. Receiver Optical Specifications (-40 to 85°C, 3.3V +/- 5%)

| Parameter               | Min  | Typ | Max  | Units | Notes |
|-------------------------|------|-----|------|-------|-------|
| Sensitivity             |      |     | -33  | dBm   | 6     |
| Receiver Overload       | -8   |     |      | dBm   | 6     |
| Wavelength of Operation | 1490 |     | 1530 | nm    |       |

6. With  $BER \leq 10^{-12}$ , measured in the centre of the eye opening with PRBS 2<sup>7</sup>-1

## 6. Transceiver Electrical Pad Layout

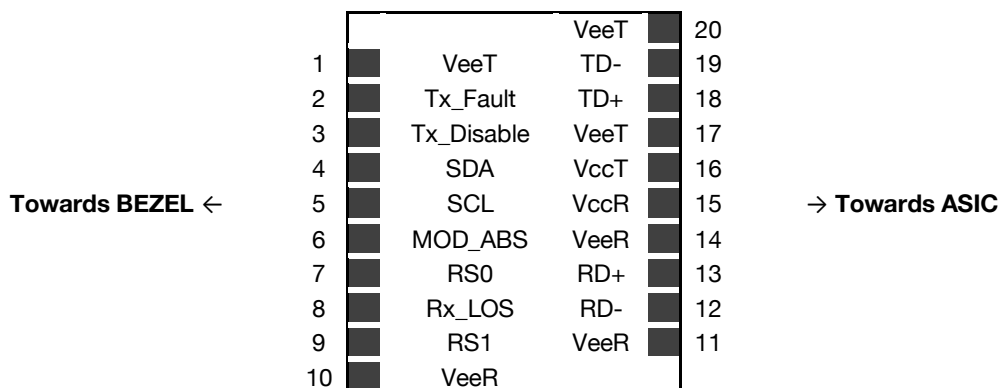


Figure 2. Transceiver Electrical Pad Layout



7. Module Electrical Pin Definition

| Pin Number | Name       | Function                            |
|------------|------------|-------------------------------------|
| 1          | VeeT       | Transmitter Ground                  |
| 2          | TX_Fault   | Transmitter Fault Indication        |
| 3          | TX_Disable | Transmitter Disable                 |
| 4          | SDA        | 2-Wire Serial Interface Data (SDA)  |
| 5          | SCL        | 2-Wire Serial Interface Clock (SCL) |
| 6          | MOD_ABS    | Function Not available              |
| 7          | RS0        | Rate Select 0 grounded              |
| 8          | Rx_LOS     | Loss of signal                      |
| 9          | RS1        | Rate select 1 grounded              |
| 10         | VeeR       | Receiver Ground                     |
| 11         | VeeR       | Receiver Ground                     |
| 12         | RD-        | Inverted received data output       |
| 13         | RD+        | Received data output                |
| 14         | VeeR       | Receiver Ground                     |
| 15         | VccR       | Receiver Power                      |
| 16         | VccT       | Transmitter Power                   |
| 17         | VeeT       | Transmitter Ground                  |
| 18         | TD+        | Transmit data input                 |
| 19         | TD-        | Inverted transmit data input        |
| 20         | VeeT       | Transmitter Ground                  |

8. EEPROM

SFP MSA (INF-8074 & SFF-8472)

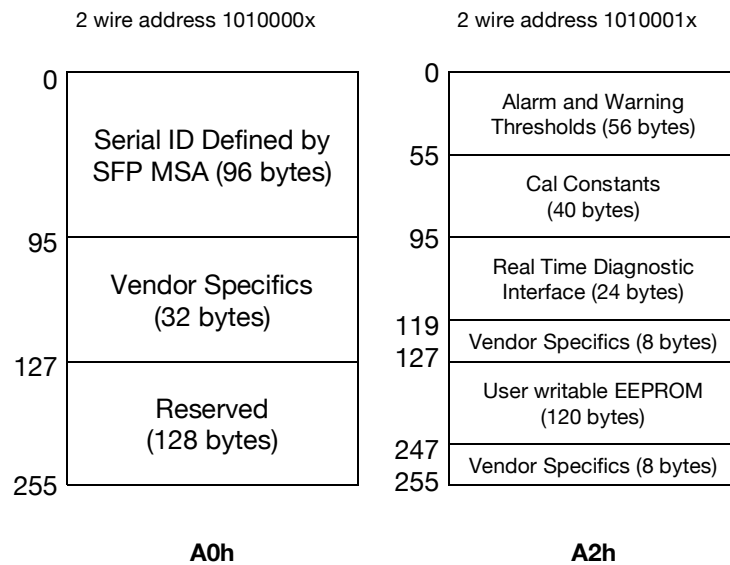


Figure 3. EEPROM of a SFP



## 9. Ordering Information

| Part Number         | Description  |
|---------------------|--|
| <b>SBD71120GE00</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>LC connector, 0°C to 70°C</b>        |
| <b>SBD71120GE0D</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>LC connector, 0°C to 70°C, DDM</b>   |
| <b>SBD71120GE10</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>LC connector, -20°C to 85°C</b>      |
| <b>SBD71120GE1D</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>LC connector, -20°C to 85°C, DDM</b> |
| <b>SBD71120GE30</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>SC connector, 0°C to 70°C</b>        |
| <b>SBD71120GE3D</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>SC connector, 0°C to 70°C, DDM</b>   |
| <b>SBD71120GE40</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>SC connector, -20°C to 85°C</b>      |
| <b>SBD71120GE4D</b> | SFP single fibre upstream, Tx 1570nm (DFB) , Rx 1510nm (APD), maximum distance 120km, power budget 33dB, Gigabit Ethernet, <b>SC connector, -20°C to 85°C, DDM</b> |

Skylane Optics supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:  
[support@skylaneoptics.com](mailto:support@skylaneoptics.com)

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