

# SBU34020GExx – SFP Single Upstream Transceiver

## Tx 1310nm & Rx 1490nm / 20km / 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 3015.7 / 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

SBU34020GExx is a high performance transceiver module for Gigabit Ethernet data links over one single mode fibre. The maximum reach<sup>1</sup> is 20km, with 14dB end of life (EOL) power budget. The emitter is a 1310nm Fabry-Perot (FP) laser, the receiver is a 1490nm PIN photodiode. Consequently, a module with a 1490nm emitter and a 1310nm receiver is required at the opposite side of the link. The recommended counterpart is SBD43020GExx.

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
- 1310nm FP transmitter, 1490nm PIN receiver
- 20km point-to-point transmission on single mode fibre
- Gigabit Ethernet compliant
- 1x Fibre Channel compatible
- Operating temperature range 0°C to 70°C or -40°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] |
|--------------|--------------------------|-----------------------------------------|-------------------------------------------------|----------------------------------------------|--------------------------------|
| SBU34020GExx | Tx 1310 nm<br>Rx 1490 nm | -8 to -3                                | ≤ -22                                           | 0                                            | ≥ 14                           |

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, together with SBD43020GExx

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   | SBU34020GE0x, SBU34020GE3x |
|                                       | -40  |     | 85   | °C   | SBU34020GE2x, SBU34020GE5x |
| 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                    | -8   |      | -3   | dBm  | 5     |
| Centre Wavelength                       | 1260 | 1310 | 1360 | nm   |       |
| Optical Extinction Ratio ER             | 6    | 9    |      | dB   |       |
| Spectral Width (-20dB)                  |      |      | 3.5  | nm   |       |

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

| 5.3. Receiver Optical Specifications |      |      |      |      |       |
|--------------------------------------|------|------|------|------|-------|
| Parameter                            | Min  | Typ  | Max  | Unit | Notes |
| Sensitivity                          |      |      | -22  | dBm  | 6     |
| Receiver Overload                    | 0    |      |      | dBm  |       |
| Wavelength of Operation              | 1450 | 1490 | 1530 | nm   |       |

6. With BER≤10<sup>-12</sup>, measured in the centre of the eye opening with PRBS 2<sup>7</sup>-1

## 6. Transceiver Electrical Pad Layout

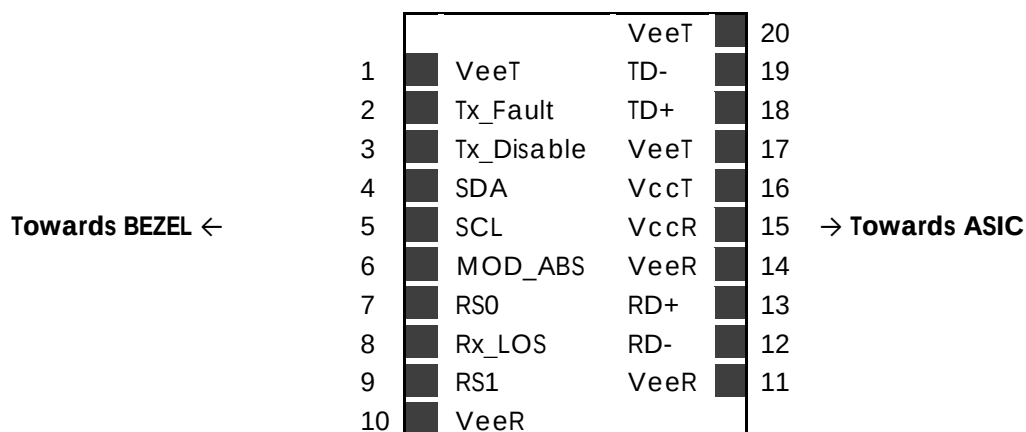


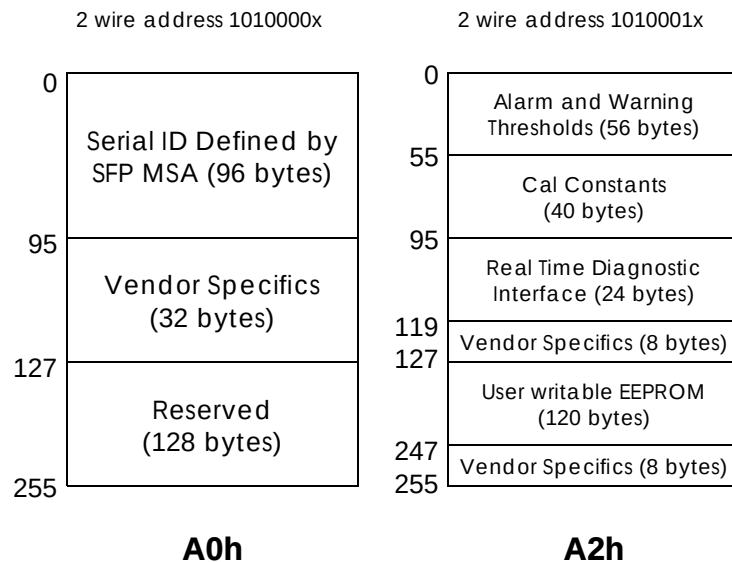
Figure 2. Transceiver Electrical Pad Layout

## 7. Pin Functions Definitions

| 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    | Grounded within the module          |
| 7          | RS0        | Not Connected                       |
| 8          | Rx_LOS     | Loss of signal                      |
| 9          | RS1        | Receiver Ground                     |
| 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 (SFF-8074 & SFF-8472)



## 9. Ordering information

| Part Number         | Description                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SBU34020GE00</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>LC connector, 0°C to 70°C</b>        |
| <b>SBU34020GE0D</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>LC connector, 0°C to 70°C, DDM</b>   |
| <b>SBU34020GE20</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>LC connector, -40°C to 85°C</b>      |
| <b>SBU34020GE2D</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>LC connector, -40°C to 85°C, DDM</b> |
| <b>SBU34020GE30</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>SC connector, 0°C to 70°C</b>        |
| <b>SBU34020GE3D</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>SC connector, 0°C to 70°C, DDM</b>   |
| <b>SBU34020GE50</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>SC connector, -40°C to 85°C</b>      |
| <b>SBU34020GE5D</b> | SFP single fibre upstream, Tx 1310nm (FP) , Rx 1490nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, <b>SC connector, -40°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**

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