SBD43020GExx– SFP Single Downstream Transceiver
Tx 1490nm & Rx 1310nm / 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

SBD43020GExx is a high performance SFP transceiver module for Gigabit Ethernet data links over one single mode fibre. The maximum reach[1] is 20km, with 14dB end of life (EOL) power budget. The transmitter is a 1490nm DFB laser, the receiver is a 1310nm PIN photodiode. Consequently, a module with a 1310nm transmitter and a 1490nm receiver is required at the opposite side of the link. The recommended counterpart is SBU34020GExx.

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
- 1490nm DFB transmitter, 1310nm PIN receiver
- 20km point-to-point transmission on single mode fibre
- Operating temperature range 0°C to 70°C or -40°C to 85°C
- Low power dissipation (<1W)
- Digital diagnostic monitoring (DDM)



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

3. Applications

- Gigabit Ethernet
- 1×Fiber Channel

4. Optical Interface

P/N	Wavelength [nm]	Output Optical Power[2] [dBm]	Optical Receiver Sensitivity[3] [dBm]	Optical Receiver Overload[4] [dBm]	Power Budget[2] [dB]
SBD43020GExx	Tx 1490 nm Rx 1310 nm	-8 to -3	≤ -22	-3	≥ 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 SBU34020GExx
3. Measured with 1.25Gbps PRBS 2^7-1, ER=9dB, BER≤10^{-12}
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	SBD43020GE0x, SBD43020GE3x
	-40		85	°C	SBD43020GE2x, SBD43020GE5x
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	1460	1490	1520	nm	
Optical Extinction Ratio ER	6	9		dB	
Spectral Width (-20dB)			1	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	-3			dBm	
Wavelength of Operation	1260		1360	nm	

6. Measured with 1.25Gbps PRBS 2^7-1, ER=9dB, BER≤10^{-12}

6. Transceiver Electrical Pad Layout

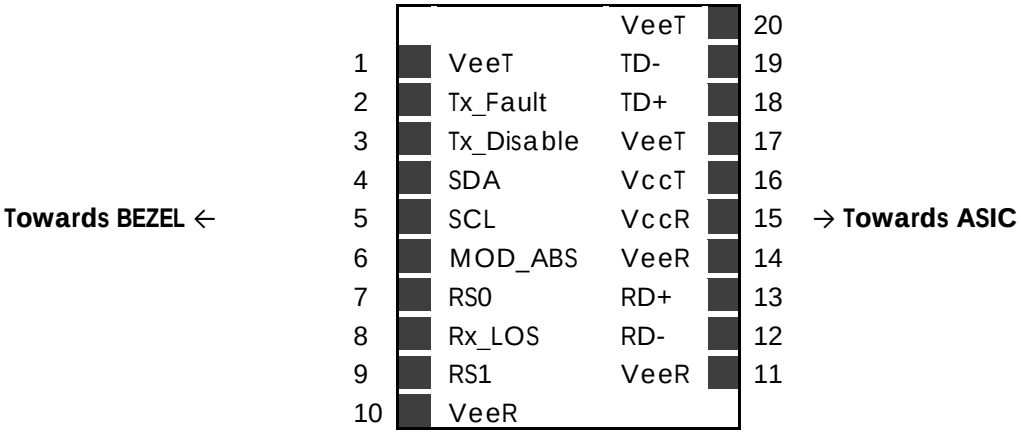


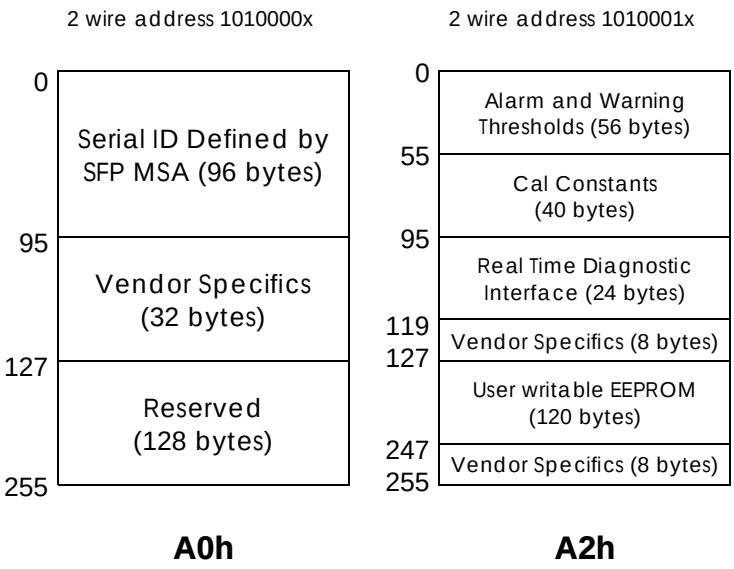
Figure 2. Transceiver Electrical Pad Layout

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 (INF-8074 & SFF-8472)



9. Ordering Information

Part Number	Description
SBD43020GE00	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **LC connector, 0°C to 70°C**
SBD43020GE0D	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **LC connector, 0°C to 70°C, DDM**
SBD43020GE20	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **LC connector, -40°C to 85°C**
SBD43020GE2D	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **LC connector, -40°C to 85°C, DDM**
SBD43020GE30	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **SC connector, 0°C to 70°C**
SBD43020GE3D	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **SC connector, 0°C to 70°C, DDM**
SBD43020GE50	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **SC connector, -40°C to 85°C**
SBD43020GE5D	SFP single fibre downstream, Tx 1490nm (DFB) , Rx 1310nm (PIN), maximum distance 20km, power budget 14dB, Gigabit Ethernet, **SC connector, -40°C to 85°C, DDM**

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:
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