SPB3201010xx – SFP+ Single Fibre

Tx 1330nm Rx 1270nm / 10km / 10x 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

SPB3201010xx is a high-performance transceiver module for up to 10× Gigabit Ethernet data links over a single mode fibre. The maximum reach[1] is 10km, with 9dB end of life (EOL) power budget. The transmitter is a 1330nm DFB laser, the receiver a 1270nm PIN photodiode. Consequently, a module with a 1270nm transmitter and a 1330nm receiver is required at the opposite side of the link. The recommended counterpart is SPB2301010xx.

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 (SFF-8431)
- Hot pluggable SFP+ footprint
- Serial ID functionality supported according to (SFF-8472)
- Class 1 laser safety standard IEC 60825 compliant
- Single LC connector
- 1330nm DFB transmitter, 1270nm PIN receiver
- 10km 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 (<1.5W)
- Digital diagnostics monitoring (DDM)

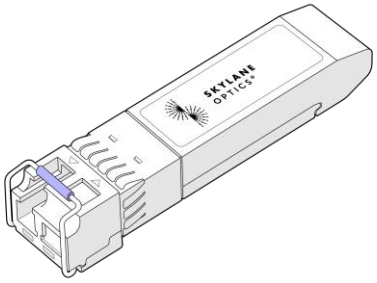

Figure 1. SFP+ Single Fiber
(non-binding illustration)

3. Applications

- 10× Gigabit Ethernet
- 9.83 Gbps CPRI
- 8× Fiber Channel
- 4× Fiber Channel
- 2× Fiber Channel

4. Optical Interface

P/N	Wavelength [nm]	Optical Output Power[2] [dBm]	Receiver Sensitivity[3] [dBm]	Dispersion Penalty [dB]	Receiver Overload[4] [dBm]	Power Budget[2] [dB]
SPB3201010xx	Tx 1330 Rx 1270	-5 to 0	≤ -14	N/A	0	≥ 9

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 SPB2301010xx
3. Measured with 10.3125Gbps PRBS 2^{31}-1, 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	SPB32010100D, SPB32010100B, SPB3201010GD, SPB3201010AD
	-40		85		SPB32010102D, SPB32010102B
Relative Humidity	5		95	%	
Power Supply Voltage	3.15	3.3	3.45	V	
Power Supply Current			430	mA	

5.2. Transmitter Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Average Output Power	-5		0	dBm	5
Centre Wavelength	1320	1330	1340	nm	
Spectral Width (-20dB)			1	nm	
Extinction Ratio	3.5			dB	
Dispersion Penalty		N/A		dB	

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

5.3. Receiver Optical Specifications					
Parameter	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Receiver Sensitivity			-14	dBm	6
Receiver Overload	0			dBm	6
Receiver Operating Range	1260		1280	nm	

6. Measured with 10.3125Gbps PRBS 2^{31}-1, BER≤10^{-12}

6. Transceiver Electrical Pad Layout

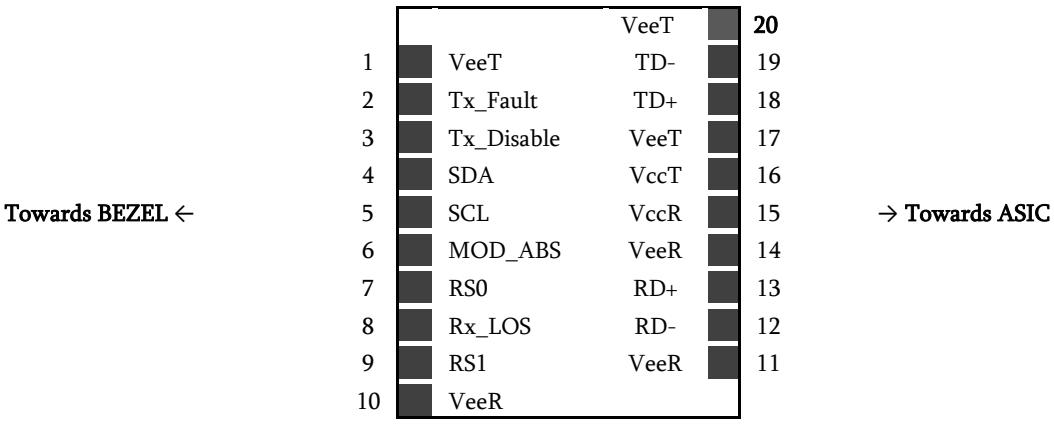

Figure 2. Transceiver Electrical Pad Layout

7. Module Electrical Pin Definition

SFP+ MSA (SFF-8431)

Pin Number	Name	Function
1	VeeT	Module Transmitter Ground
2	Tx_Fault	Module Transmitter Fault
3	Tx_ Disable	Transmitter Disable
4	SDA	2-Wire Serial Interface Data
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	Not Used
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Not Used
10	VeeR	Module Receiver Ground
11	VeeR	Module Receiver Ground
12	RD-	Receiver Inverted Data Output
13	RD+	Receiver Non-Inverted Data Output
14	VeeR	Module Receiver Ground
15	VccR	Module Receiver 3.3V Supply
16	VccT	Module Transmitter 3.3V Supply
17	VeeT	Module Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input
19	TD-	Transmitter Inverted Data Input
20	VeeT	Module Transmitter Ground

8. EEPROM

SFP+ MSA (SFF-8472)

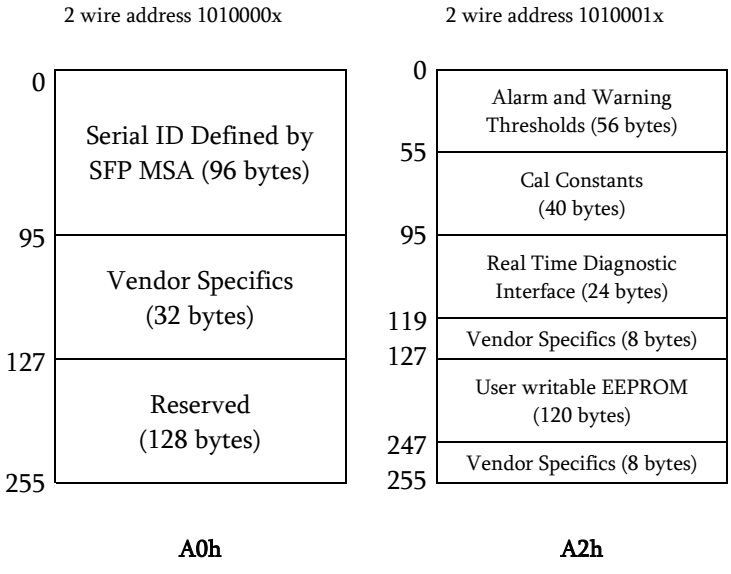

Figure 3. EEPROM of a SFP+

9. Ordering Information

Part Number	Description
SPB32010100D	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **0°C to 70°C**, DDM
SPB32010100B	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **Gen B, 0°C to 70°C**, DDM
SPB32010102D	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **-40°C to 85°C**, DDM
SPB32010102B	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **Gen B, -40°C to 85°C**, DDM
SPB3201010GD	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **0°C to 70°C**, DDM, Specific Firmware
SPB3201010AD	SFP+ Single Fibre, Tx 1330nm (DFB) , Rx 1270nm (PIN), maximum distance 10km, power budget 9dB, 10x Gigabit Ethernet, LC connector, **0°C to 70°C**, DDM, Specific Firmware

10. Document Revision Information

Revision	Description
A	Initial release
B	Specification updated to include 8x Fiber Channel compatibility
C	Ordering information table updated with the "G" and "A" versions
D	Specification updated to include CPRI compatibility
E	Gen B variants added. Extended temperature variant removed

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