

SPB5408010xD – SFP+ Single Fibre

Tx 1550nm Rx 1490nm / 80km / 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

SPB5408010xD is a high-performance transceiver module for up to 11.3Gbps data links over a single mode fibre. The maximum reach¹ is 80km, with 22dB end of life (EOL) power budget. The transmitter is a cooled 1550nm Electro-Absorption Modulated Laser (EML), the receiver is a 1490nm APD photodiode. Consequently, a module with a 1490nm transmitter and a 1550nm receiver is required at the opposite side of the link. The recommended counterpart is SPB4508010xD.

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
- Cooled 1550nm EML transmitter, 1490nm APD receiver
- 80km point-to-point transmission on single mode fibre
- Operating temperature range 0°C to 70°C
- Low power dissipation (< 1.5W)
- Digital diagnostics monitoring (DDM)

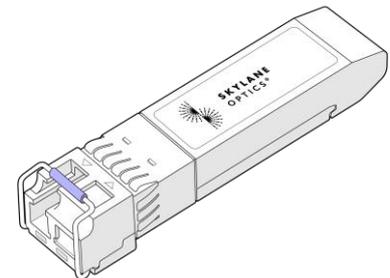


Figure 1. SFP+ Single Fiber (non-binding illustration)

3. Applications

- 10x Gigabit Ethernet
- 8x Fiber Channel
- 4x Fiber Channel
- 2x 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]
SPB5408010xD	Tx 1550 Rx 1490	-1 to 3	≤ -23	3	-6	≥ 22

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

2. EOL, over operating temperature range, together with SPB4508010xD

3. Measured with 10.3125Gbps PRBS 2³¹-1, BER≤10⁻¹²

4. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers 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	
Relative Humidity	5		95	%	
Power Supply Voltage	3.14	3.3	3.47	V	
Power Supply Current			450	mA	

5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-1		3	dBm	5
Centre Wavelength	1542.5		1557.5	nm	
Spectral Width (-20dB)			0.3	nm	
Extinction Ratio	7.5			dB	
Dispersion Penalty			3	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			-23	dBm	6
Receiver Overload	-6			dBm	6
Receiver Operating Range	1480		1500	nm	

6. Measured with 10.3125Gbps PRBS 2³¹-1, BER ≤ 10⁻¹²

6. Transceiver Electrical Pad Layout

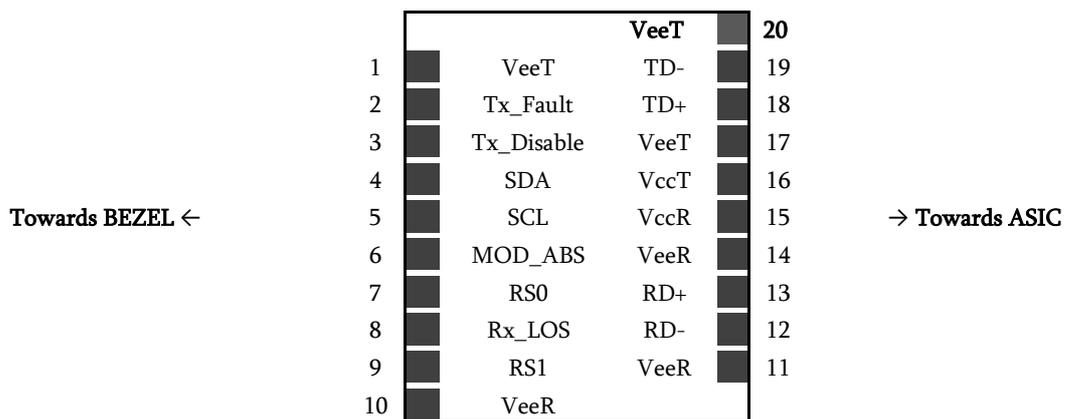


Figure 2. Transceiver Electrical Pad Layout

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)

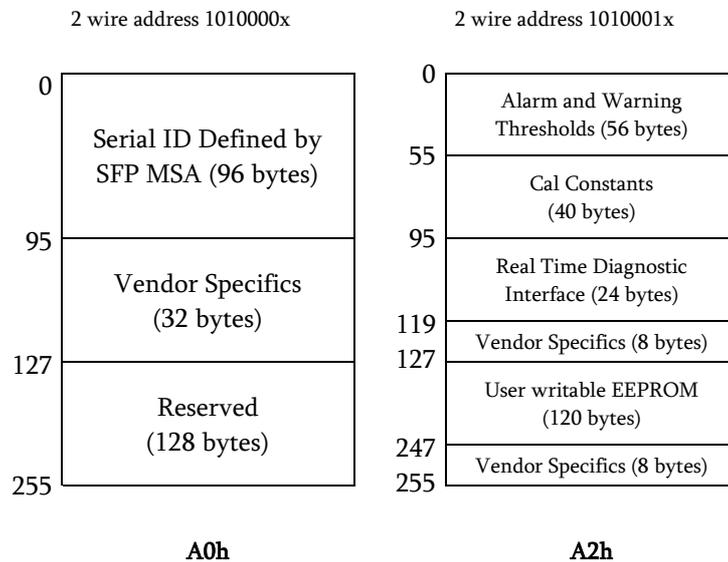


Figure 3. EEPROM of a SFP+

9. Ordering Information

Part Number	Description
SPB54080100D	SFP+ Single Fibre, Tx 1550nm (EML), Rx 1490nm (APD), maximum distance 80km, power budget 22dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPB5408010ED	SFP+ Single Fibre, Tx 1550nm (EML), Rx 1490nm (APD), maximum distance 80km, power budget 22dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, specific Firmware
SPB5408010GD	SFP+ Single Fibre, Tx 1550nm (EML), Rx 1490nm (APD), maximum distance 80km, power budget 22dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, specific Firmware

10. Document Revision Information

Revision	Description
A	Initial release

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

**Beyond
Quality**

**Reliable
Alliance**

**Performing
Smartly**