

# SPP1304010xx – SFP+ Dual Fibre

1310nm / 40km / 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 Class 1 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

SPP1304010xx is a high-performance transceiver module for 10x Gigabit Ethernet data links over a single mode fibre pair. The maximum reach<sup>1</sup> is 40km, with 15dB end of life (EOL) power budget. The transmitter is a 1310nm Distributed Feedback (DFB) laser, the receiver is a PIN photodiode.

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
- Dual LC connector
- 1310nm DFB transmitter
- 40km 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)

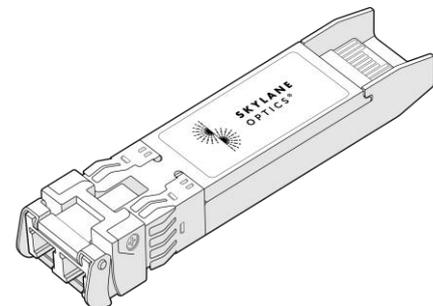


Figure 1. SFP+ Dual Fiber (non-binding illustration)

## 3. Applications

- 10GE switches and routers
- 9.83 Gbps CPRI
- 8x Fiber Channel
- 4x Fiber Channel
- 2x Fiber Channel

## 4. Optical Interface

P/N	Wavelength [nm]	Optical Output Power <sup>2</sup> [dBm]	Receiver Sensitivity <sup>3</sup> [dBm]	Receiver Overload <sup>4</sup> [dBm]	Power Budget <sup>2</sup> [dB]
SPP1304010xx	1310nm	-1 to 4	≤ -16	0	≥ 15

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  
 3. Measured with 10.3125Gbps PRBS 2<sup>31</sup>-1, BER≤10<sup>-22</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	SPP13040100D, SPP13040100B, SPP1304010GD, SPP1304010AD
	-40		85		SPP13040102D, SPP13040102B
Relative Humidity	5		95	%	
Power Supply Voltage	3.15		3.45	V	
Power Supply Current			400	mA	

5.2. Transmitter Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-1		4	dBm	5
Centre Wavelength	1260	1310	1355	nm	
Extinction Ratio	3.5			dB	
Spectral Width (-20dB)			1	nm	

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

5.3. Receiver Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-16	dBm	6
Receiver Overload	0			dBm	
Operating Wavelength	1260		1620	nm	

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

## 6. Transceiver Electrical Pad Layout

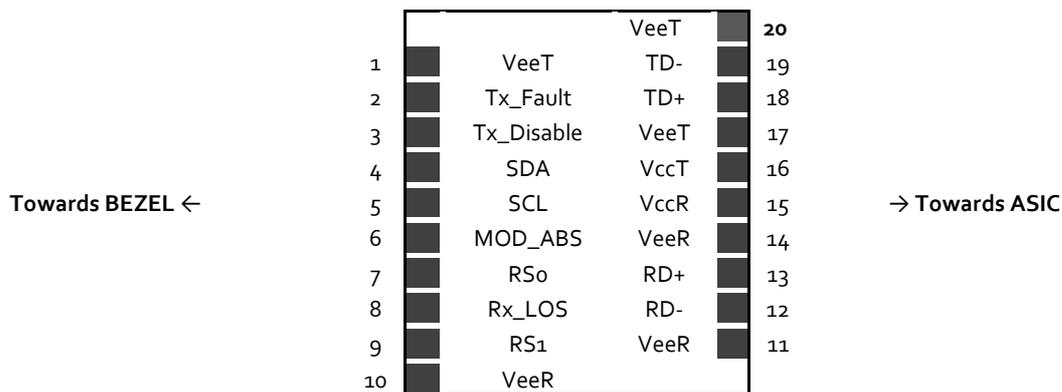


Figure 2. Transceiver Electrical Pad Layout



7. Module Electrical Pin Definition

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-8431)

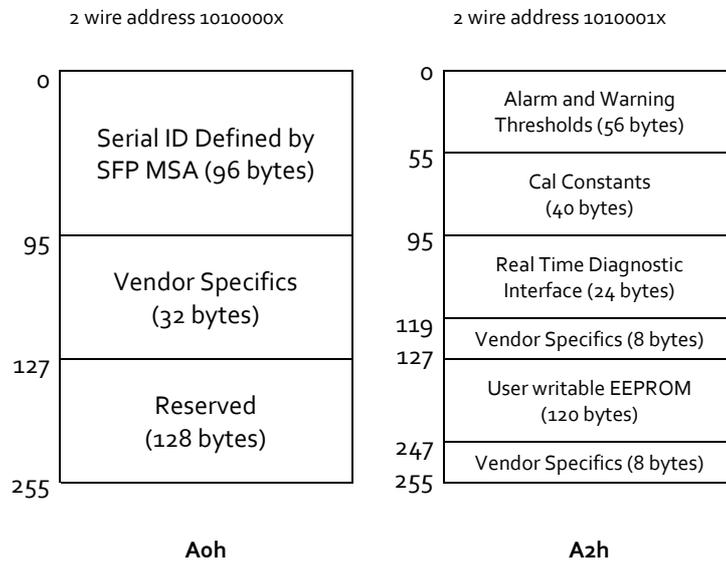


Figure 3. EEPROM of a SFP+

## 9. Ordering Information

Part Number	Description
SPP13040100D	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>0°C to 70°C</b> , DDM
SPP13040100B	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>Gen B, 0°C to 70°C</b> , DDM
SPP13040102D	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>-40°C to 85°C</b> , DDM
SPP13040102B	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>-40°C to 85°C</b> , DDM
SPP1304010GD	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>Gen B, 0°C to 70°C</b> , DDM, <b>Specific Firmware</b>
SPP1304010AD	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 15dB, 10 Gigabit Ethernet, LC connector, <b>0°C to 70°C</b> , DDM, <b>Specific Firmware</b>

## 10. Document Revision Information

Revision	Description
A	Initial release
B	Specification updated to include 8x Fiber Channel compatibility and CPRI compatibility Ordering information table updated with the "G" and "A" versions
C	Some key parameter values updated. Gen B variants added

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)

