

# SPP1304010xD – 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 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

SPP1304010xD is a high performance transceiver module for 10x Gigabit Ethernet data links over a singlemode fibre pair. The maximum reach is 40km, for a 14dB end of life (EOL) power budget. The emitter is a 1310nm 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 singlemode fibre
- 10x Gigabit Ethernet compliant
- Operating temperature range 0°C to 70°C or -40°C to 85°C
- Low power dissipation (<1W)
- Digital diagnostics monitoring (DDM)

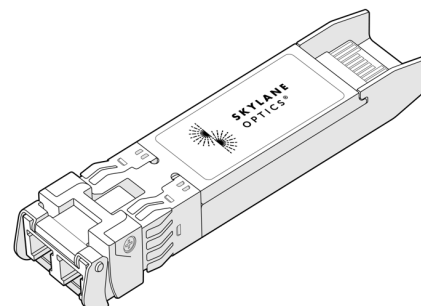


Figure 1. SFP+ Dual Fiber 1310nm (non-binding illustration)

## 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]	Output Optical Power <sup>2</sup> [dBm]	Receiver Sensitivity <sup>3</sup> [dBm]	Receiver Overload <sup>4</sup> [dBm]	Power Budget <sup>2</sup> [dB]
SPP1304010xD	1310nm	-1 to 4	≤ -15	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  
 3. Measured at 10x Gigabit Ethernet  
 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	-40		85	°C	SPP13040102D
Operating Case Temperature	0		70	°C	SPP13040100D
Relative Humidity	5		95	%	
Power Supply Voltage	3.15		3.45	V	
Power Supply Current			300	mA	

### 5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-1		4	dBm	5
Center Wavelength	1270	1310	1355	nm	
Optical Extinction Ratio ER	3.5			dB	
Spectral Width			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			-15	dBm	6
Receiver Overload	0			dBm	
Wavelength of Operation	1260		1565	nm	

6. With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with  $2^7-1$  PRBS

## 6. Transceiver Electrical Pad Layout

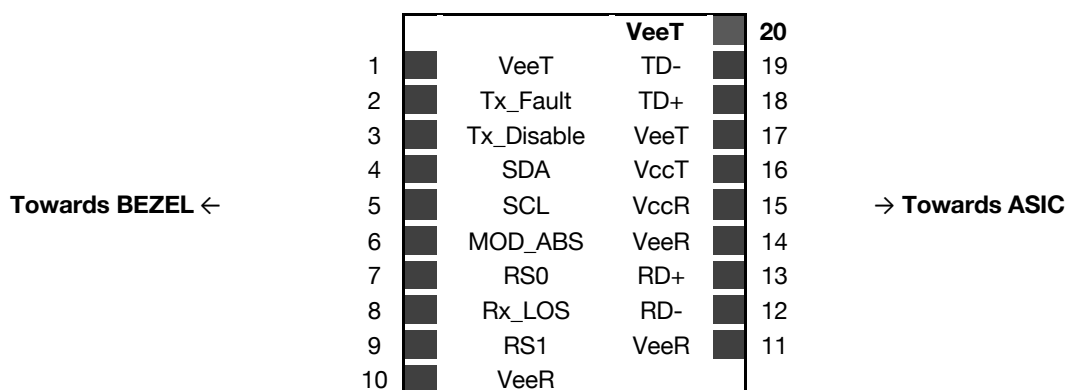


Figure 2. Transceiver Electrical Pad Layout

**7. Module Electrical Pin Definition**

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	Function Not available
7	RS0	Rate Select 0 grounded
8	Rx_LOS	Loss of signal
9	RS1	Rate select 1 grounded
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-8431)

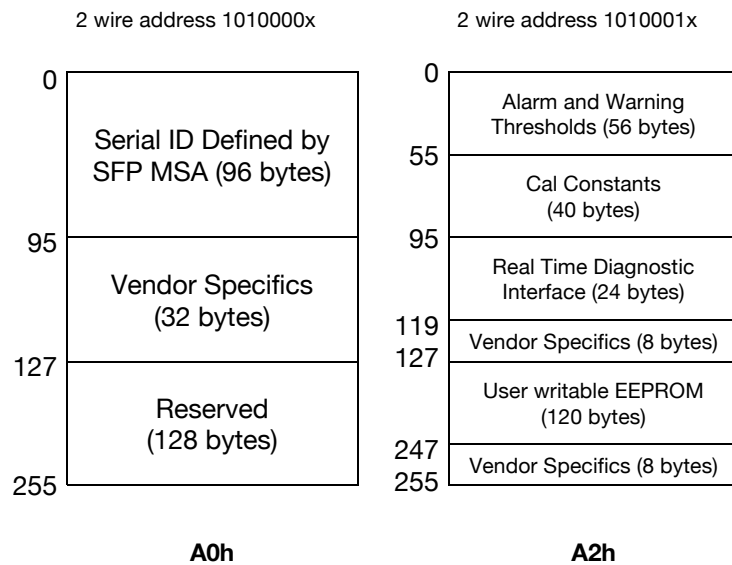


Figure 3. EEPROM of a SFP+

## 9. Ordering Information

Part Number	Description
SPP13040100D	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 14dB, 10 Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPP13040102D	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 14dB, 10 Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SPP1304010GD	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 14dB, 10 Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, Specific Firmware
SPP1304010AD	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 40km, power budget 14dB, 10 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 and CPRI compatibility Ordering information table updated with the "G" and "A" versions

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)

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