

SPP1301010xD – SFP+ Dual Fibre **1310nm / 10km / 10× Gigabit Ethernet**

#01 Overview

SPP1301010xD is a high performance transceiver module for up to 10× Gigabit Ethernet data links over a single mode fibre pair. The maximum reach¹ is 10 km, with 6.2 dB end of life (EOL) power budget. The transmitter is a 1310 nm 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.

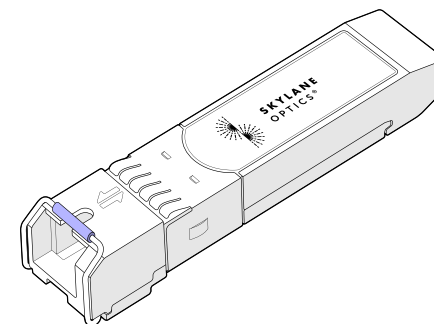


Figure 1. SFP+ Dual Fiber
(non-binding illustration)

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#02 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
- 1310 nm DFB transmitter
- 10 km 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 diagnostics monitoring (DDM)

#03 Applications

- 10× Gigabit Ethernet
- 8× Fiber Channel
- 4× Fiber Channel
- 2× Fiber Channel

#04 Optical Interface

P/N	SPP1301010xD
Wavelength [nm]	1310
Optical Output Power ² [dBm]	-8.2 to 0.5
Receiver Sensitivity ³ [dBm]	≤ -14.4
Dispersion Penalty [dB]	3.2
Receiver Overload ⁴ [dBm]	0
Power Budget ² [dB]	≥ 6.2

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 at 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 (optical loop back) before ensuring that proper optical attenuation is used

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#05 Technical Parameters

5.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	0		70	°C	SPP13010100D
	-40		85	°C	SPP13010102D
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	-8.2		0.5	dBm	5
Centre Wavelength	1270	1310	1355	nm	
Spectral Width (-20dB)			1	nm	
Extinction Ratio	3.5			dB	
Dispersion Penalty			3.2	dB	

5.3. Receiver Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-14.4	dBm	6
Receiver Overload	-6			dBm	6
Receiver Operating Range	1260		1565	nm	

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

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



#06 Transceiver Electrical Pad Layout

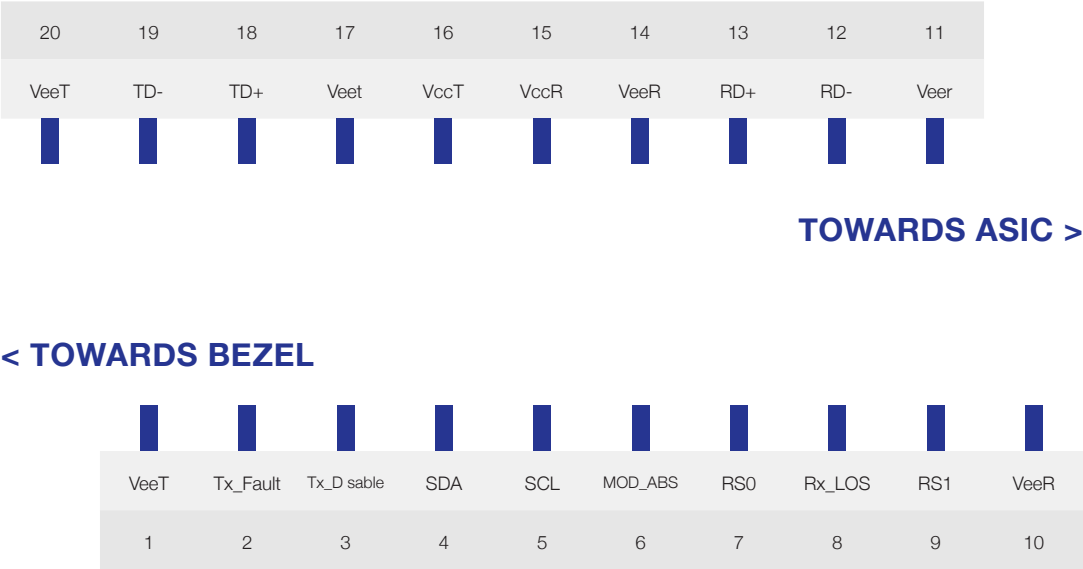


Figure 2. Transceiver Electrical Pad Layout

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#07 Module Electrical Pin Definition

SFP+ MSA (SFF-8431)

Pin	Symbol	Description	Pin	Symbol	Description
1	VeeT	Module Transmitter Ground	11	VeeR	Module Receiver Ground
2	Tx_Fault	Module Transmitter Fault	12	RD-	Receiver Inverted Data Output
3	Tx_Disable	Transmitter Disable	13	RD+	Receiver Non-Inverted Data Output
4	SDA	2-Wire Serial Interface Data	14	VeeR	Module Receiver Ground
5	SCL	2-Wire Serial Interface Clock	15	VccR	Module Receiver 3.3V Supply
6	Mod_ABS	Module Absent	16	VccT	Module Transmitter 3.3V Supply
7	RS0	Rate Select 0	17	VeeT	Module Transmitter Ground
8	Rx_LOS	Receiver Loss of Signal	18	TD+	Transmitter Non-Inverted Data Input
9	RS1	Not Used	19	TD-	Transmitter Inverted Data Input
10	VeeR	Module Receiver Ground	20	VeeT	Module Transmitter Ground

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#08 EEPROM - SFP+ MSA (SFF-8472)

A0H			A2H		
		2 wire address 1010000x			2 wire address 1010001x
0	Serial ID Defined by SFP MSA	(96 Bytes)	0	Alarm and Warning-Thresholds	(56 Bytes)
95	Vendor Specifics	(32 Bytes)	55	Cal Constants	(40 Bytes)
127	Reserved	(128 Bytes)	95	Real Time Diagnostic Interface	(24 Bytes)
255			119	Vendor Specifics	(8 Bytes)
			127	User writable EEPROM	(120 Bytes)
			247	Vendor Specifics	(8 Bytes)
			255		

Figure 3. EEPROM of a SFP+

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#09 Ordering information

Part Number	Description
SPP13010100D	SFP+ Dual Fibre, Tx 1310 nm (DFB) , Rx (PIN), maximum distance 10 km, power budget 6.2 dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM
SPP13010102D	SFP+ Dual Fibre, Tx 1310 nm (DFB) , Rx (PIN), maximum distance 10 km, power budget 6.2 dB, 10x Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SPP1301010GD	SFP+ Dual Fibre, Tx 1310 nm (DFB) , Rx (PIN), maximum distance 10 km, power budget 6.2 dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, Specific Firmware
SPP1301010AD	SFP+ Dual Fibre, Tx 1310 nm (DFB) , Rx (PIN), maximum distance 10 km, power budget 6.2 dB, 10x Gigabit Ethernet, LC connector, 0°C to 70°C, DDM, Specific Firmware

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#10 Document Revision Information

Revision	Description
RevA	Initial release
RevB	Specification updated to include 8x Fiber Channel compatibility
RevC	Ordering information table updated with the "G" and "A" versions

For your product safety, please read the following information carefully before any manipulation of the box:



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).

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