

# SPP130100HxC – SFP+ Dual Fibre

1310nm / 10km / 10C-192 Multirate / CDR

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

SPP130100HxC is a high-performance transceiver module for OC-192 multirate data links over a single mode fibre pair. The maximum reach<sup>1</sup> is 10km (9/125µm), with 8.6dB end of life (EOL) power budget. The transmitter is a 1310nm DFB laser, the receiver 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)
- Hardware/Software rate select for 8.5Gbps or 9.95 - 11.3Gbps operation
- Class 1 laser safety standard IEC 60825 compliant
- Dual LC Connector
- 1310nm DFB Transmitter
- PIN Photodiode
- Built-in Tx and Rx Clock Data Recovery (CDR)
- 10km point-to-point transmission on 9/125µm fibre
- Operating temperature range 0°C to 70°C or -40°C to 85°C
- Low power dissipation (<1.2W)

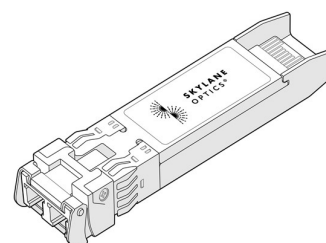


Figure 1. SFP+ Dual Fibre  
(non-binding illustration)

## 3. Applications

- SONET OC-192/SDH STM-64
- 10GBASE-LR/LW
- 10×Fiber Channel
- 8×Fiber Channel

## 4. Optical Interface

P/N	Wavelength [nm]	Optical Output Power <sup>2</sup> [dBm]	Optical Receiver Sensitivity <sup>3</sup> [dBm]	Dispersion Penalty [dB]	Optical Receiver Overload <sup>4</sup> [dBm]	Power Budget <sup>2</sup> [dB]
SPP130100HxC	1310	-6 to -1	≤ -14.6	≤ 1	0.5	≥ 8.6

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>-12</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	SPP130100H0C
	-40		85		SPP130100H2C
Relative Humidity	5		95	%	Noncondensing
Power Supply Voltage	3.135	3.3	3.465	V	
Power Supply Current			360	mA	

5.2. General Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Data Rate		8.5		Gbps	CDR set to 8.5Gbps operation
	9.95		11.3	Gbps	CDR set to 9.95 - 11.3Gbps operation

5.3. Transmitter Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-6		-1	dBm	5
Centre Wavelength	1290	1310	1330	nm	
Spectral Width (-20dB)			1	nm	
Extinction Ratio	6			dB	
Dispersion Penalty			1	dB	

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

5.4. Receiver Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-14.4	dBm	6
Receiver Overload	0.5			dBm	6
Receiver Operating Range	1260		1565	nm	

6. Measured with 10.3125Gbps, PRBS 2<sup>31</sup>-1, BER≤10<sup>-12</sup>

## 6. Transceiver Electrical Pad Layout

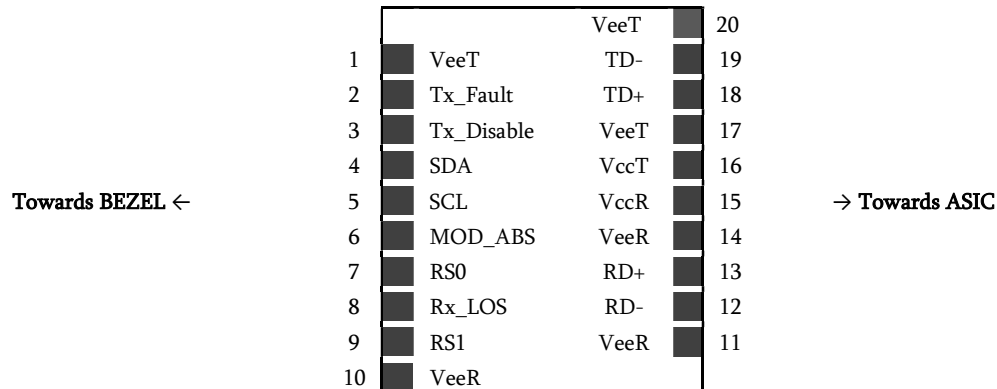


Figure 2. Transceiver Electrical Pad Layout



## 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	Rate Select 0, see paragraph 7.1
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Rate select 1, see paragraph 7.1
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

### 7.1. CDR Operation Set Matrix

RS0 Pin	RS1 Pin	A2h Byte 110 (Bit 3)	A2h Byte 118 (Bit 3)	CDR (Tx and Rx) operation
LOW	LOW	0	0	8.5Gbps
		0	1	Bypassed
		1	0	Bypassed
		1	1	9.95Gbps to 11.3Gbps
LOW	HIGH	0	0	Bypassed
		0	1	Bypassed
		1	0	9.95Gbps to 11.3Gbps
		1	1	9.95Gbps to 11.3Gbps
HIGH	LOW	0	0	Bypassed
		0	1	9.95Gbps to 11.3Gbps
		1	0	Bypassed
		1	1	9.95Gbps to 11.3Gbps
HIGH	HIGH	0	0	9.95Gbps to 11.3Gbps
		0	1	9.95Gbps to 11.3Gbps
		1	0	9.95Gbps to 11.3Gbps
		1	1	9.95Gbps to 11.3Gbps



## 8. EEPROM

SFP+ MSA [SFF-8431]

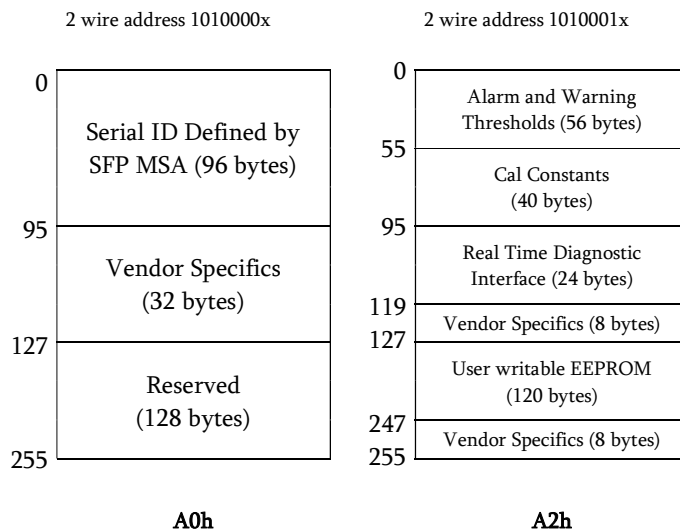


Figure 3. EEPROM of a SFP+

## 9. Ordering Information

Part Number	Description
SPP130100H0C	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 10km, power budget 8.6dB, OC-192 multirate (CDR), LC connector, <b>0°C to 70°C</b> , DDM
SPP130100H2C	SFP+ Dual Fibre, Tx 1310nm (DFB), Rx (PIN), maximum distance 10km, power budget 8.6dB, OC-192 multirate (CDR), LC connector, <b>-40°C to 85°C</b> , DDM

## 10. Document Revision Information

Revision	Description
A	Initial release
B	Industrial temperature variant 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)

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