SKYLANE OPTICS®

SPP85P3010xx – SFP+ Dual Fibre

850nm / 300m / 10x Gigabit Ethernet

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

CE RoHS TÜVRheinland

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

SPP85P3010xx is a high-performance transceiver module for up to 10× Gigabit Ethernet data links over a multimode fibre pair. The maximum reach[1] is 300m (50/125μm), with 4dB end of life (EOL) power budget. The transmitter is an 850nm VCSEL, 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

- Electrical interface specification as per SFF-8431
- Hot pluggable SFP+ footprint
- Management interface specification as per SFF-8431 and SFF-8472
- Class 1 laser safety standard IEC 60825 compliant
- SFP+ MSA package with duplex LC connector
- 850nm VCSEL transmitter
- PIN receiver
- 300m point-to-point transmission on 50/125μm fibre
- Operating temperature range 0℃ to 70℃ or -40℃ to 85℃
- Low power dissipation (< 1W)
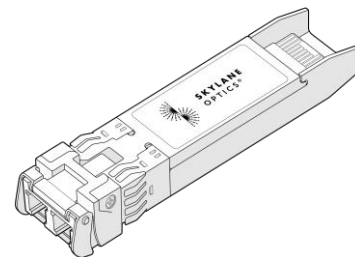- Digital Diagnostics Monitoring (DDM)

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

3. Applications

- 10× Gigabit Ethernet
- 9.83 Gbps CPRI
- 8× Fiber Channel
- 4× Fiber Channel
- 2× Fiber Channel

4. Optical Interface

P/N	Wavelength [nm]	Optical Output Power[2] [dBm]	Receiver Sensitivity[3] [dBm]	Transmitter and Dispersion Penalty [dB]	Receiver Overload[4] [dBm]	Power Budget[2] [dB]
SPP85P3010xx	850	-6 to -1	≤ -10	3.9	-1	≥ 4

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^{31}-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

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	SPP85P30100D, SPP85P30100B, SPP85P3010AD, SPP85P3010GD
	-40		85		SPP85P30102D, SPP85P30102B
Relative Humidity	5		95	%	Non condensing
Power Supply Voltage	3.15	3.3	3.45	V	
Power Supply Current			300	mA	
Power Dissipation			1	W	

5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-6		-1	dBm	5
Centre Wavelength	840		860	nm	
Spectral Width (RMS)			0.45	nm	
Extinction Ratio	3			dB	
Transmitter and Dispersion Penalty (TDP)			3.9	dB	

5.   Output power coupled into a 50/125µm µm multimode fibre

5.3. Receiver Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-10	dBm	6
Receiver Overload	-1			dBm	6
Receiver Operating Range	840		860	nm	

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

6. Transceiver Electrical Pad Layout

Towards BEZEL ←

		VeeT	20
1	VeeT	TD-	19
2	Tx_Fault	TD+	18
3	Tx_Disable	VeeT	17
4	SDA	VccT	16
5	SCL	VccR	15
6	MOD_ABS	VeeR	14
7	RS0	RD+	13
8	Rx_LOS	RD-	12
9	RS1	VeeR	11
10	VeeR		

→ Towards ASIC
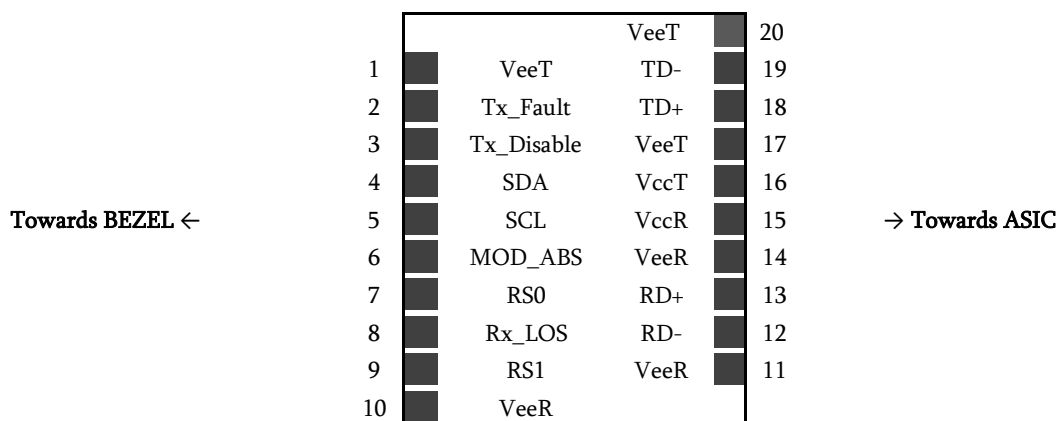
Figure 2. Transceiver Electrical Pad Layout

Datasheet

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7. Module Electrical Pin Definition

SFP+ MSA (SFF-8431)

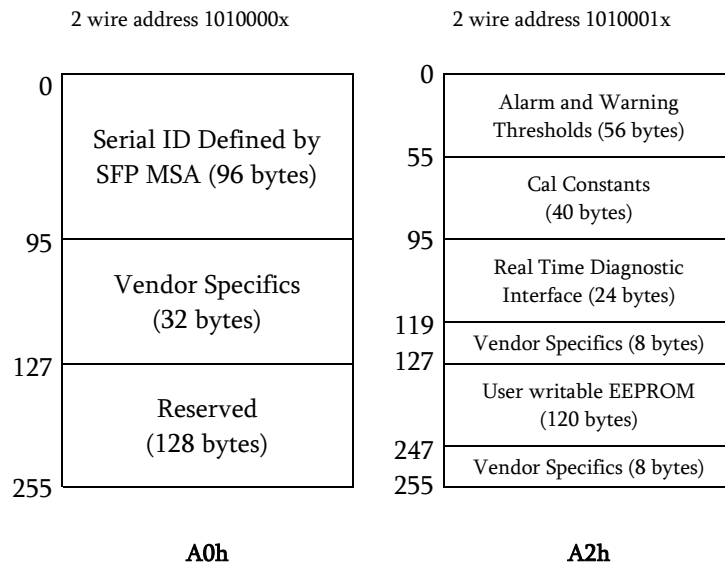| Pin Number	Name	Function
1	VeeT	Module Transmitter Ground
2	Tx_Fault	Module Transmitter Fault
3	Tx_ Disable	Transmitter Disable
4	SDA	2-Wire Serial Interface Data
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	Not Used
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Not Used
10	VeeR	Module 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]

2 wire address 1010000x

```
0
    Serial ID Defined by
    SFP MSA (96 bytes)
95
    Vendor Specifics
    (32 bytes)
127
    Reserved
    (128 bytes)
255
```
A0h

2 wire address 1010001x

```
0
    Alarm and Warning
    Thresholds (56 bytes)
55
    Cal Constants
    (40 bytes)
95
    Real Time Diagnostic
    Interface (24 bytes)
119
    Vendor Specifics (8 bytes)
127
    User writable EEPROM
    (120 bytes)
247
    Vendor Specifics (8 bytes)
255
```
A2h

Figure 3. EEPROM of a SFP+

9. Ordering Information

Part Number	Description
SPP85P30100D	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **0℃ to 70℃**, DDM
SPP85P30100B	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **Gen B, 0℃ to 70℃**, DDM
SPP85P30102D	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **-40℃ to 85℃**, DDM
SPP85P30102B	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **Gen B, -40℃ to 85℃**, DDM
SPP85P3010GD	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **0℃ to 70℃,** DDM, Specific Firmware
SPP85P3010AD	SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 4dB, 10x Gigabit Ethernet, LC connector, **0℃ to 70℃**, DDM, Specific Firmware

10. Document Revision Information

Revision	Description
A	Initial release
B	Specification updated to include 8x Fiber Channel compatibility
C	Ordering information table updated with the "G" and "A" versions
D	Industrial temperature part SPP85P30102D added
E	Specification updated to include CPRI compatibility
F	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

Beyond Quality

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