

SPP85P301R0D – SFP+ Dual Fibre

850nm / 300m / 10x/1x 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

SPP85P301R0D is a high performance transceiver module for up to 10.3Gbps data links over a multimode fibre pair. The maximum reach is 300m (50/125µm), with 5dB 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
- Supports Data Rates up to 10.3Gbps
- Rx Rate Select function
- Dual LC connector
- 850nm VCSEL transmitter
- 300m, point-to-point transmission on 50/125µm multi-mode fibre
- Operating temperature range 0°C to 70°C
- Low power dissipation (<1W)
- Digital Diagnostics Monitoring (DDM)

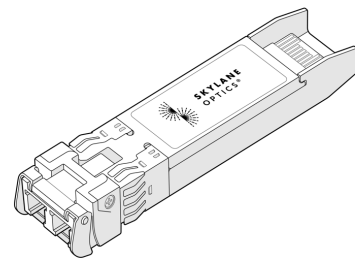


Figure 1. SFP+ Dual Fibre (non-binding illustration)

3. Applications

- 10GBASE-SR / SW
- 8x Fibre channel
- 4x Fibre channel
- 2x Fibre channel
- 1000BASE-SX

4. Optical Interface

| P/N | Wavelength [nm] | Optical Output Power ² [dBm] | Receiver Sensitivity ³ [dBm] | Dispersion Penalty [dB] | Receiver Overload ⁴ [dBm] | Power Budget ² [dB] |
|--------------|-----------------|-----------------------------------------|-----------------------------------------|-------------------------|--------------------------------------|--------------------------------|
| SPP85P301R0D | 850nm | -6 to -1 | ≤ -11.1 | 3.9 | -1 | ≥ 5 |

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, @10.3125Gbps

3. Measured with 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

5. Technical Parameters

| 5.1. Recommended Operating Conditions | | | | | |
|---------------------------------------|------|-----|------|-------|----------------|
| Parameter | Min | Typ | Max | Units | Notes |
| Storage temperature | -40 | | 85 | °C | |
| Operating Case Temperature | 0 | | 70 | °C | |
| Relative Humidity | 5 | | 95 | % | Non condensing |
| 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 | -6 | | -1 | dBm | 5,6 |
| | -9.5 | | -1 | | 5,7 |
| Centre Wavelength | 840 | | 860 | nm | |
| Spectral Width (RMS) | | | 0.45 | nm | |
| Extinction Ratio | 3 | | | dB | 6 |
| | 9 | | | | 7 |
| Dispersion Penalty | | | 3.9 | dB | |

- 5. Output power coupled into a 50/125 µm multimode fibre
- 6. Measured at 10.3125Gbps
- 7. Measured at 1.25Gbps

| 5.3. Receiver Optical Specifications | | | | | |
|--------------------------------------|-----|-----|-------|------|-------|
| Parameter | Min | Typ | Max | Unit | Notes |
| Receiver Sensitivity | | | -11.1 | dBm | 8 |
| | | | -17 | | 9 |
| Receiver Overload | -1 | | | dBm | 8 |
| Receiver Operating Range | 840 | | 860 | nm | |

- 8. Measured with 10.3125Gbps PRBS 2³¹-1, BER≤10⁻¹², RS0=HI
- 9. Measured with 1.25Gbps PRBS 2⁷-1, BER≤10⁻¹², RS0=LO

6. Transceiver Electrical Pad Layout

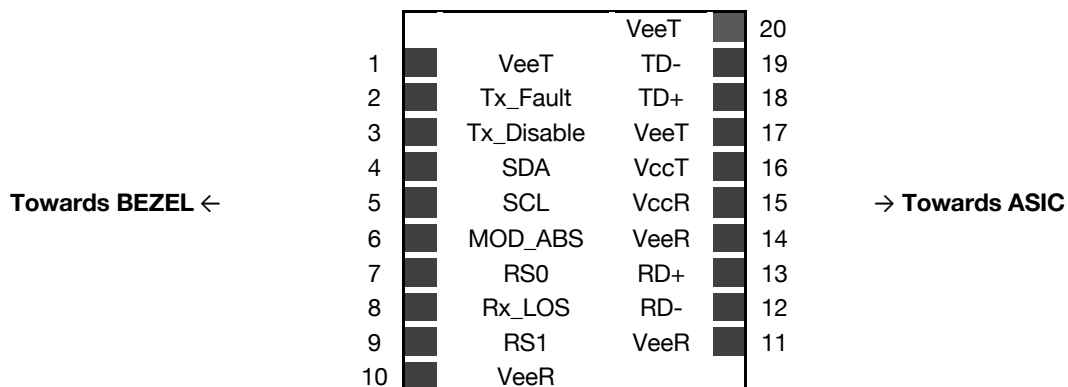


Figure 2. Transceiver Electrical Pad Layout



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 | Rate Select 0. See section 7.1 for details. Note 10 |
| 8 | Rx_LOS | Loss of signal |
| 9 | RS1 | Rate Select 1. See section 7.1 for details. Note 10 |
| 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 |

10. Internal 30kΩ pull down to GND

7.1. Rate Select Controls

| RS0 OR A2h[110.3] | LO | Rx signalling rate ≤ 4.25Gbps |
|-------------------|----|-------------------------------|
| | HI | RX signalling rate > 4.25Gbps |
| RS1 OR A2h[118.3] | LO | TX signalling rate ≤ 4.25Gbps |
| | HI | TX signalling rate > 4.25Gbps |

8. EEPROM

SFP+ MSA (SFF-8472)

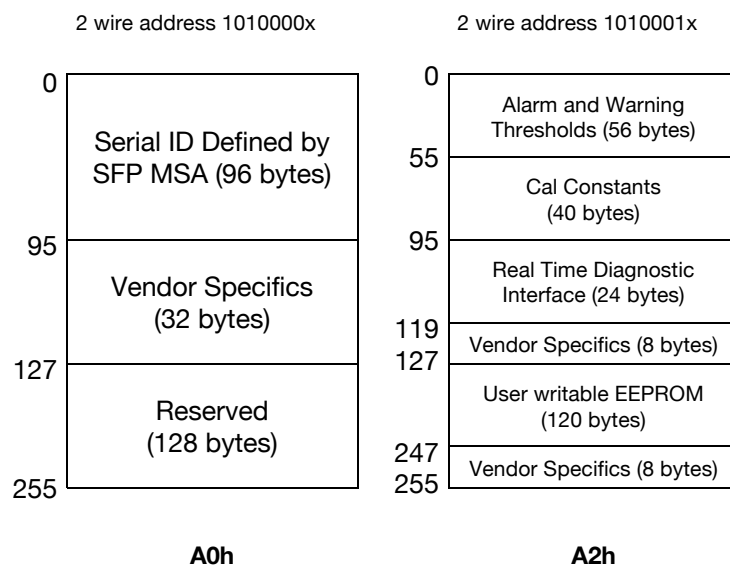


Figure 3. EEPROM of a SFP+

9. Ordering Information

| Part Number | Description |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| SPP85P301R0D | SFP+ Dual Fibre, Tx 850nm (VCSEL), Rx (PIN), maximum distance 300m, power budget 5dB, 1×/10× Gigabit Ethernet, LC connector, 0°C to 70°C, DDM |

10. Document Revision Information

| Revision | Description |
|----------|-------------------------------------------------------------------------|
| A | Initial release |
| B | Some electro-optical parameters updated to reflect the current hardware |
| C | Rate select truth table 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**

**Reliable
Alliance**

**Performing
Smartly**