SFP+ 10 km transceiver | 10G LR Ethernet

# Datasheet

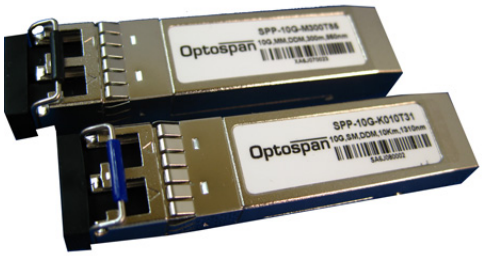
## SFP+ Optical Transceiver

## SPP-81D-K010T31

### Product Features

- 10GBASE-LR/LW Ethernet 8.4dB SFP+
- 10 km LR SFP+ for SMF @ 10Gbps
- 1310nm DFB+PIN Laser 10 km SFP+
- 0°C - 70°C Temperature - Extended/Industrial Available
- 2-Wire Interface Digital Diagnostic Monitoring (SFF-8724)
- Hot-swappable for SFP+ LC ports
- OptoSpan 1 year standard warranty
- Use with Finisar, Avago, JDSU & networks not requiring OEM compatibility
- Compliant with SFF-8431, SFF-8432
- RoHS compliant

*** For OEM Compatibility, use Platinum Series Part# PSPP-81DT31K010**




### Applications

- 10GBASE-LR @ 10.31Gbps
- 10 Gigabit Ethernet
- Fibre Channel 8x
- Fibre Channel 4x

## Description

OptoSpan SPP-81D-K010T31 is a Duplex 10GBASE-LR/LW Ethernet 10G Ethernet / 8G FC SFP+ transceiver designed for long distance optical communications up to 10 km with signaling rates up to 10Gbps.

OptoSpan 10Gb Standard optical transceivers are compatible with many brands such as Finisar, Avago, JDSU and network environments that do not require any special compatibility. For networks that require special OEM compatibility, such as CISCO, BROCADE, JUNIPER, ALCATEL, HP, NORTEL, EMC, QLOGIC and other OEMs, consider OptoSpan Platinum OEM Series transceiver model# PSPP-81DT31K010.

All OptoSpan long-reach SFP+ s are ROHS compliant, allow for real-time diagnostic monitoring as per SFF-8472 and designed to meet Multi-Source Agreement (MSA) standards for Duplex transceivers with LC interface.

### Optical Budget Calculation for 10 km SFP+ Optical Transceiver

| **SPP-81D-K010T31** | **Distance:** 10 km | | | | **Fiber:** 1310nm SMF | |
|---|---|---|---|---|---|---|
| | **Tx Min dBm** | **Tx Max dBm** | **Rx Min dBm** | **Rx Max dBm** | **Link Attenuation dB** | **Power Budget dB** |
| **Product Specifications** | **-6** | **0** | **-14.4** | **0.5** | | |
| **Optical Calculation Results** | | | **-11.5** | **-5.5** | **5.5** | **8.4** |

## General Specifications

| Parameter | Unit | Min. | Typ. | Max |
|---|---|---|---|---|
| **Absolute Maximum Ratings** | | | | |
| Maximum Supply Voltage | V | -0.5 | | 3.6 |
| Storage Temperature | °C | -40 | | +85 |
| Case Operating Temperature | °C | -5 | | +70 |
| **Recommended Operating Condition** | | | | |
| Supply Voltage | V | 3.15 | 3.3 | 3.45 |
| Supply Current | mA | | | 300 |
| Data Rate | Gbps | 0.6 | | 11.1 |

## Electrical Characteristics

| Parameter | Unit | Min. | Typ. | Max |
|---|---|---|---|---|
| **Transmitter** | | | | |
| Differential Input Voltage Swing | mVpp | 150 | | 1200 |
| Input Differential Impedance | ohm | 85 | 100 | 115 |
| Transmit Disable Voltage - High | V | 2 | | 3.45 |
| Transmit Disable Voltage - Low | V | 0 | | 0.8 |
| Transmit Fault Voltage - High | V | 2 | | Vcc+0.3 |
| Transmit Fault Voltage - Low | V | 0 | | 0.5 |
| **Receiver** | | | | |
| Differential Output Voltage Swing | mVpp | 350 | | 700 |
| Differential Output Impedance | ohms | 90 | 100 | 110 |
| LOS Output Voltage - High | V | 2 | | Vcc+0.3 |
| LOS Output Voltage - Low | V | 0 | | 0.8 |

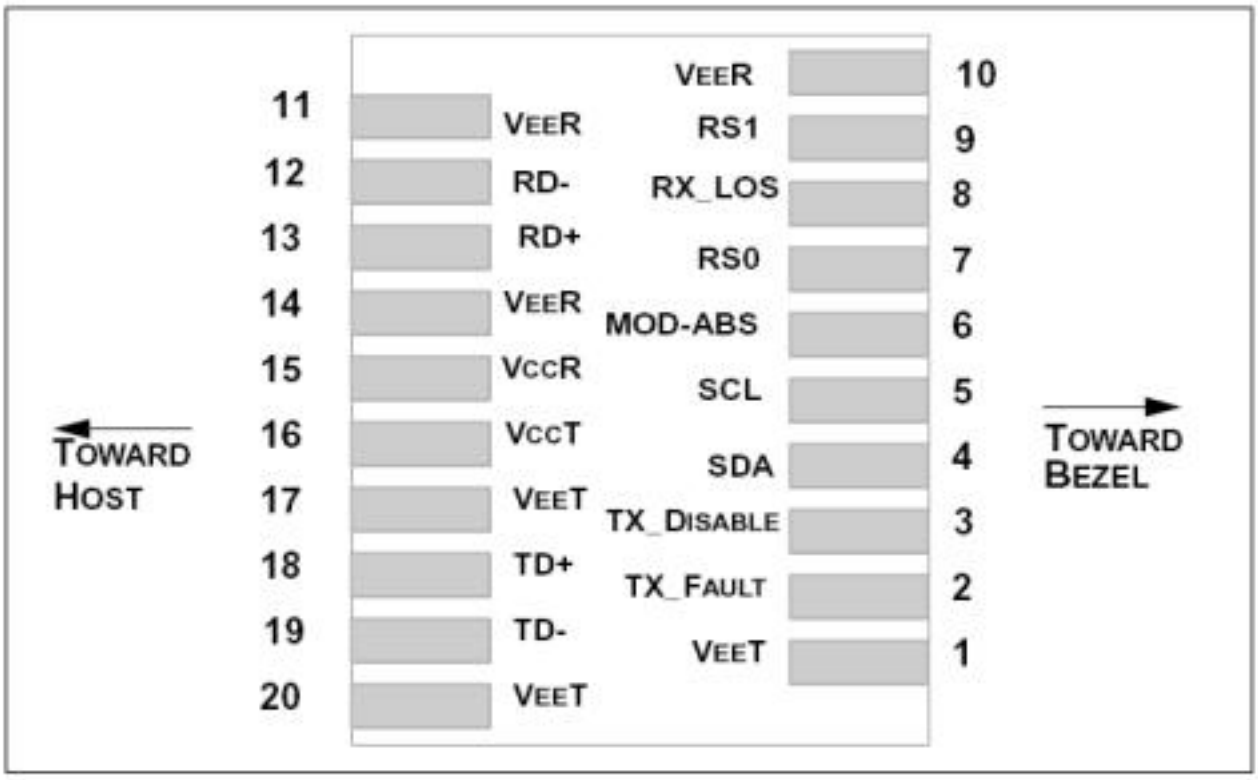
## Optical Characteristics

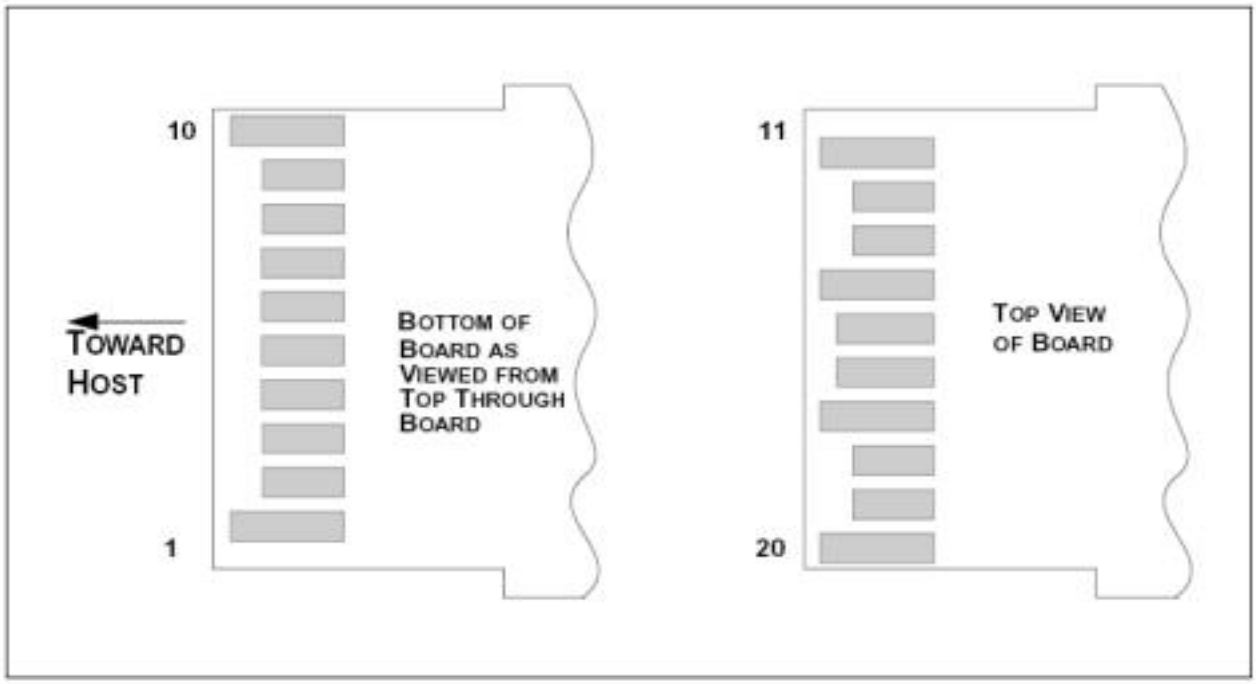
| Parameter | Unit | Min. | Typ. | Max |
|---|---|---|---|---|
| **Transmitter** | | | | |
| Output Optical Power | dBm | -6 | | 0 |
| Optical Extinction Ratio | dB | 3.5 | | |
| Optical Wavelength | nm | 1270 | 1310 | 1355 |
| Spectral Width | nm | | | 1 |
| Side Mode Suppression Ratio | dB | 30 | | |
| **Receiver** | | | | |
| Optical Center Wavelength | nm | 1260 | | 1565 |
| Receiver Sensitivity @ 10.3Gbps | dBm | -14.4 | | 0.5 |
| LOS DE-Assert | dBm | | | -16 |
| LOS Assert | dBm | -28 | | |

## Laser Safety

This is a class 1 Laser Product according to IEC 60825-1:1993:+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

## PIN Layout


11
VEER
12
RD-
13
RD+
14
VEER
15
VCCR
16
VCCT
17
VEET
18
TD+
19
TD-
20
VEET
VEER
10
RS1
9
RX_LOS
8
RS0
7
MOD-ABS
6
SCL
5
SDA
4
TX_DISABLE
3
TX_FAULT
2
VEET
1
TOWARD HOST
TOWARD BEZEL


10
1
TOWARD HOST
BOTTOM OF BOARD AS VIEWED FROM TOP THROUGH BOARD
11
20
TOP VIEW OF BOARD

## PIN Functions

| Pin # | Name - Description |
|---|---|
| 1 | Transmitter Ground |
| 2 | Transmitter Fault Indication |
| 3 | Transmitter Disable |
| 4 | Module Definition 2 |
| 5 | Module Definition 1 |
| 6 | Module Definition 0 |
| 7 | RX Rate Select (LVTTL) |
| 8 | Loss of Signal |
| 9 | TX Rate Select (LVTTL) |
| 10 | Receiver Ground |
| 11 | Receiver Ground |
| 12 | Inv. Received Data out |
| 13 | Received Data Out |
| 14 | Receiver Ground |
| 15 | Receiver Power |
| 16 | Transmitter Power |
| 17 | Transmitter Ground |
| 18 | Transmit Data In |
| 19 | Inv. Transmit Data In |
| 20 | Transmitter Ground |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |
| 26 | |
| 27 | |
| 28 | |
| 29 | |
| 30 | |

## Mechanical Layouts