

SPP-ZR

SFP+ Single-Mode, Dual Fiber transceiver, with Digital Diagnostics



Product description

The SPP-ZR series single mode transceiver is small form factor pluggable module for duplex optical data communications of 10G. It is with the SFP+ 20-pin connector to allow hot plug capability.

This module is designed for single mode fiber and operates at a nominal wavelength of 1550 nm. The transmitter section uses a 1550nm EML, which is class 1 laser compliant according to International Safety Standard IEC-60825.

The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

Features

- Data rate up to 10.3 Gbps
- 1550nm cooled EML transmitter
- High sensitivity APD receiver
- Distance up to 80km over SMF
- Single 3.3V Power supply and TTL logic interface
- Duplex LC connector interface
- Hot pluggable
- Power dissipation < 1.5 W
- Dispersion tolerance 1600ps/nm
- Operating case temperature
- Standard: 0 °C ~+70 °C
- Compliant with SFF-8431 MSA
- Compliant with SFF-8432 MSA
- Compliant with SFF-8472 MSA

Applications

- 10GBASE-ZR/ZW
- 10G FC
- Other optical links



All product specifications are subject to change without notice to improve reliability, function or design or otherwise.

Opticonnect SYSTEMS B.V., an Optical Networking vendor with its headquarters in the Netherlands, provides Optical Transport solutions and Optical Transceivers at the best price performance ratio possible. Our goal is to simplify the planning, deployment and maintenance of

complex Optical Networks. This is achieved by our user friendly planning apps and information, sophisticated products and transparent support. Relying on our superior product quality, all items are supplied with life time warranty.

Ordering information

| Part no. | Data rate | Laser | Fiber type | Distance | Interface | Temp | DDMI |
|----------|----------------|------------|------------|----------|-----------|----------|------|
| SPP-ZR | Up to 10.3Gbps | 1550nm EML | SMF | 80km | LC | Standard | YES |

Regulatory compliance

| Feature | Standard | Performance |
|--|--|--|
| Electrostatic discharge (ESD) to the electrical pins | MIL-STD-883G Method 3015.7 | Class 1C (>1000 V) |
| Electrostatic discharge to the enclosure | EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE | Compliant with standards |
| Electromagnetic interference (EMI) | FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B | Compliant with standards. Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins depend on customer host board and chassis design. |
| Immunity | EN 55024:1998+A1+A2 IEC 61000-4-3 | Compliant with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/receiver performance is detectable between these limits. |
| Laser eye safety | FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1 | CDRH compliant and Class I laser product. TüV Certificate No. 50135086 |
| Component recognition | UL and CUL EN60950-1:2006 | UL file E317337 TüV Certificate No. 50135086 (CB scheme) |
| RoHS6 | 2002/95/EC 4.1&4.2 2005/747/EC 5&7&13 | Compliant with standards ^{*note1} |

Note1: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1st, 2007, which meets the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union. In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes...In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item 13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for Opticonnect's transceivers, because Opticonnect's transceivers use glass, which may contain Pb, for components such as lenses, isolators, and other electronic components.

Absolute maximum ratings ^{*note2}

| Parameter | Symbol | Min. | Max. | Unit |
|---------------------|-----------------|------|------|------|
| Storage temperature | T _s | -40 | +85 | °C |
| Supply voltage | V _{CC} | -0.5 | 3.6 | V |

Note2: Exceeding any one of these values may destroy the device permanently.

Recommended operating conditions

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|----------------------------|-------------|------|---------|------|------|
| Operating case temperature | T_C | 0 | | +70 | °C |
| Power supply voltage | V_{CC} | 3.15 | 3.3 | 3.45 | V |
| Power supply current | I_{CC} | | | 455 | mA |
| Surge current | I_{Surge} | | | +30 | mA |
| Baud rate | SPP-ZR | | | 10.3 | GBps |

Performance specifications - Electrical

| Parameter | Symbol | Min. | Typ. | Max | Unit | Notes |
|---------------------------------|--------|------|------|--------------|------|---------------------------|
| Transmitter | | | | | | |
| CML inputs (differential) | Vin | 150 | | 1200 | mVpp | AC coupled inputs |
| Input impedance (differential) | Zin | 85 | 100 | 115 | ohms | Rin > 100 kohms @ DC |
| Tx_DISABLE input voltage - high | | 2 | | $V_{CC}+0.3$ | V | |
| Tx_DISABLE input voltage - low | | 0 | | 0.8 | V | |
| Tx_FAULT output voltage - high | | 2 | | $V_{CC}+0.3$ | V | Io = 400µA; Host V_{CC} |
| Tx_FAULT output voltage - low | | 0 | | 0.5 | V | Io = -4.0mA |
| Receiver | | | | | | |
| CML outputs (differential) | Vout | 350 | | 700 | mVpp | AC coupled outputs |
| Output impedance (differential) | Zout | 85 | 100 | 115 | ohms | |
| Rx_LOS output voltage - high | | 2 | | $V_{CC}+0.3$ | V | Io = 400µA; Host V_{CC} |
| Rx_LOS output voltage - low | | 0 | | 0.8 | V | Io = -4.0mA |
| MOD_DEF (2:0) | VoH | 2.5 | | | V | With serial ID |
| | VoL | 0 | | 0.5 | V | |

Performance specifications - Optical

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|--|-----------------|------|---------|------|------|
| 9µm Core diameter SMF | | | 80 | | km |
| Transmitter | | | | | |
| Centre wavelength | λ_C | 1528 | 1550 | 1565 | nm |
| Spectral width (-20dB) | $\Delta\lambda$ | | | 1 | nm |
| Average output power ^{*note3} | $P_{out,AVG}$ | 0 | | 5 | dBm |

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|------------------------------------|-------------|------|---------|------|----------|
| Extinction ratio | ER | 3.5 | | | dB |
| Side mode suppression ratio | SMSR | 30 | | | dB |
| Transmitter and dispersion penalty | TDP | | | 3 | dB |
| Average power of OFF transmitter | | | | -30 | dBm |
| Relative intensity noise | RIN | | | -128 | dB/Hz |
| Input differential impedance | Z_{IN} | 90 | 100 | 110 | Ω |
| TX Disable assert time | t_{off} | | | 10 | μs |
| Receiver | | | | | |
| Centre wavelength | λ_C | 1260 | | 1600 | nm |
| Sensitivity *note4 | P_{IN} | | | -23 | dBm |
| Receiver overload | P_{MAX} | -8 | | | dBm |
| Output differential impedance | P_{IN} | 90 | 100 | 110 | Ω |
| LOS De-Assert | LOS_D | | | -24 | dBm |
| LOS assert | LOS_A | -36 | | | dBm |

Note3: Output is coupled into a 9/125um SMF.

Note4: Minimum average optical power measured at the BER less than 1E-12, back to back. The measure pattern is PRBS 2³¹-1.