

SFPS-EX, ZX and EZX series.

SFP Single-Mode, Single Fiber transceiver for 100Mbps to 1.25Gbps FE/GbE /1GFC



Product description

The SFPS-EX-xx, SFPS-ZX-xx, SFPS-EZX-xx and SFPS-XZX-xx series are Single Fiber, bidirectional small form factor pluggable modules for GBE/FC single fiber communications. It is with the SFP 20-pin connector to allow hot plug capability. The SFPS-EX-xx, SFPS-ZX-xx and SFPS-EZX-xx series are designed to be compliant with SFF-8472.

Features

- Data rate up to 1.25Gbps
- Tx/Rx Wavelength are compliant with ITU-T G.694.2
- Spacing > 60nm
- 40/80/120 km with 9/125µm SMF
- Single 3.3V Power supply and TTL Logic Interface
- Hot Pluggable
- Simplex LC connector
- Class 1 FDA and IEC60825-1 laser safety compliant
- Compliant with SFP MSA
- Digital diagnostics SFF-8472

Applications

- Fiber Channel links
- Gigabit Ethernet links
- Fast Ethernet links
- FttX



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 | Wavelength | Distance (Km) | Interface | Temp. |
|----------------|-----------|------------|---------------|-----------|----------|
| SFPS-EX-4931D | 1.25Gbps | 1490nm | 40 | LC | Standard |
| SFPS-EX-3149D | 1.25Gbps | 1310nm | 40 | LC | Standard |
| SFPS-ZX-4955D | 1.25Gbps | 1490nm | 80 | LC | Standard |
| SFPS-ZX-5549D | 1.25Gbps | 1550nm | 80 | LC | Standard |
| SFPS-EZX-4955D | 1.25Gbps | 1490nm | 120 | LC | Standard |
| SFPS-EZX-5549D | 1.25Gbps | 1550nm | 120 | LC | Standard |

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: 30MHz to 6GHz. Good system EMI design practice required to achieve Class B margins. System margins are dependent 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 80MHz to 1GHz. 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 meet 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, windows, 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 |
| Operating relative humidity | | - | 95 | % |

Note 2: Exceeding any one of these values may destroy the device immediately.

Performance specifications - Electrical

| Parameter | Symbol | Min. | Typ. | Max | Unit | Notes |
|---------------------------------|-----------|------|------|----------------|------|--|
| Transmitter | | | | | | |
| LVPECL inputs (differential) | V_{in} | 400 | | 2000 | mVpp | AC coupled inputs ^{*(note5)} |
| Input impedance (differential) | Z_{in} | 85 | 100 | 115 | ohm | $R_{in} > 100$ kohm @ DC |
| TX_Dis | Disable | 2 | | $V_{CC} + 0.3$ | V | |
| | Enable | 0 | | 0.8 | | |
| TX_FAULT | Fault | 2 | | $V_{CC} + 0.3$ | V | |
| | Normal | 0 | | 0.5 | | |
| Receiver | | | | | | |
| LVPECL outputs (differential) | V_{out} | 370 | | 2000 | mVpp | AC coupled outputs ^{*(note5)} |
| Output impedance (differential) | Z_{out} | 85 | 100 | 115 | ohm | |
| RX_LOS | LOS | 2 | | $V_{CC} + 0.3$ | V | |
| | Normal | 0 | | 0.8 | V | |
| MOD_DEF (0:2) | VoH | 2.5 | | | V | With Serial ID |
| | VoL | 0 | | 0.5 | V | |

Performance specifications - Optical

SFPS-EX-4931D/3149D, 40km

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|-----------------|-------------------|-------------|-----------------|------|
| Power budget | | 19 | | | dB |
| Data rate | | 100 | | 1250 | Mbps |
| Transmitter | | | | | |
| Channel centre wavelength ^{*(note9)} | | $\lambda_c - 6.5$ | λ_c | $\lambda_c + 7$ | nm |
| Spectral width (-20dB) | $\Delta\lambda$ | | | 1 | nm |
| Average output power ^{*(note3)} | P_{out} | -5 | | 0 | dBm |
| Extinction ratio ^{*(note4)} | ER | 9 | | | dB |
| Side mode suppression ratio | SMSR | 30 | | | dB |
| Rise/Fall time(20%~80%) | t_r/t_f | | | 2 | ns |

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|------|---------|------|------|
| Output optical eye ^{*(note4)} | IUT-T G.957 compliant ^{*(note7)} | | | | |
| TX_Disable assert time | t_off | | | 10 | µs |
| Receiver | | | | | |
| Channel centre wavelength ^{*(note9)} | | λ-20 | λ | λ+20 | nm |
| Receiver sensitivity ^{*(note6)} | Pmin | | | -24 | dBm |
| Receiver overload | Pmax | -3 | | | dBm |
| Return loss | | 12 | | | dB |
| Optical path penalty | | | | 1 | dB |
| LOS De-Assert | LOSD | | | -25 | dBm |

SFPS-ZX-4955D/5549D, 80km

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---------------------|----------------|-------------------|------|
| Power budget | | 26 | | | dB |
| Data rate | | 100 | | 1250 | Mbps |
| Transmitter | | | | | |
| Channel centre wavelength ^{*(note9)} | | λ _c -6.5 | λ _c | λ _c +7 | nm |
| Spectral width (-20dB) | Δλ | | | 1 | nm |
| Average output power ^{*(note3)} | Pout | 0 | | +5 | dBm |
| Extinction ratio ^{*(note4)} | ER | 9 | | | dB |
| Side mode suppression ratio | SMSR | 30 | | | dB |
| Rise/Fall time(20%~80%) | t _r /t _f | | | 2 | ns |
| Output optical eye ^{*(note4)} | IUT-T G.957 compliant ^{*(note7)} | | | | |
| TX_Disable assert time | t_off | | | 10 | µs |
| Receiver | | | | | |
| Channel centre wavelength ^{*(note9)} | | λ-20 | λ | λ+20 | nm |
| Receiver sensitivity ^{*(note6)} | Pmin | | | -26 | dBm |
| Receiver overload | Pmax | -3 | | | dBm |
| Return loss | | 12 | | | dB |
| Optical path penalty | | | | 1 | dB |
| LOS De-Assert | LOSD | | | -27 | dBm |
| LOS Assert | LOSA | -45 | | | dBm |
| LOS Hysteresis ^{*(note8)} | | 0.5 | | | dB |

SFPS-EZX-4955D/5549D, 120km

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|-----------------------------------|-------------------------------|-------------------|-------------|-----------------|---------|
| Power budget | | 36 | | | dB |
| Data rate | | 100 | | 1250 | Mbps |
| Transmitter | | | | | |
| Channel centre wavelength*(note9) | | $\lambda_c - 6.5$ | λ_c | $\lambda_c + 7$ | nm |
| Spectral width (-20dB) | $\Delta\lambda$ | | | 1 | nm |
| Average output power*(note3) | Pout | 2 | | +7 | dBm |
| Extinction ratio*(note4) | ER | 9 | | | dB |
| Side mode suppression ratio | SMSR | 30 | | | dB |
| Rise/Fall time(20%~80%) | t_r/t_f | | | 2 | ns |
| Output optical eye*(note4) | IUT-T G.957 compliant*(note7) | | | | |
| TX_Disable assert time | t_{off} | | | 10 | μ s |
| Receiver | | | | | |
| Channel centre wavelength*(note9) | | $\lambda - 20$ | λ | $\lambda + 20$ | nm |
| Receiver sensitivity*(note6) | Pmin | | | -34 | dBm |
| Receiver overload | Pmax | -8 | | | dBm |
| Return loss | | 12 | | | dB |
| Optical path penalty | | | | 1 | dB |
| LOS De-Assert | LOSD | | | -35 | dBm |
| LOS Assert | LOSA | -45 | | | dBm |
| LOS Hysteresis*(note8) | | 0.5 | | | dB |

Note3: Output is coupled into a 9/125 μ m single-mode fiber.

Note4: Filtered, measured with a PRBS 2⁷-1 test pattern @1250Mbps.

Note5: LVPECL logic, internally AC coupled.

Note6: Measured at all data rates specified in Data Rate table with ER=9 dB, 2⁷-1 PRBS data pattern, BER <1E-12.

Note7: Eye pattern mask

Note8: LOS Hysteresis

