

SO-SFP-1000BASE-T

SFP, 10/100/1000Base-T SERDES Interface, copper

OVERVIEW

The SO-SFP-1000BASE-TX series electrical SFP transceiver (RJ45) is a high performance integrated duplex data link for bi-directional communication over CAT 5 unshielded twisted pair copper cable. The module is specifically designed for converting 100Base-FX NRZI port interface to 10/100Base-TX interface with RJ45 connector. The transceiver module is compliant with the SFP MultiSource Agreement (MSA), IEEE802.3u and IEEE802.3ab. With the hot pluggability, the module offers a flexible and easy way to be installed into SFP MSA compliant ports at any time without the interruption of the host equipment operating online. The Copper SFP transceivers use an integrated RJ-45 connector with transformer and PHY IC. The SO-SFP-1000BASE-T series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

PRODUCT FEATURES

- Operating data rate up to 1.25Gbps
- 850nm VCSEL laser transmitter
- 550m with 50/125µm MMF
- 300m on 62.5/125µm MMF
- Single 3.3V power supply and LVTTTL logic interface
- Hot-Pluggable SFP footprint duplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating case temperature
 - Standard: 0 °C~+70 °C
 - Industrial: -40 °C ~+85 °C
- Compliant with SFP MSA specification
- RoHS 6/6 compliant

APPLICATIONS

- Gigabit Ethernet
- Fast Ethernet
- Switch-to-Switch interface
- Optical networking

ORDERING INFORMATION

| Part Number | Description |
|---------------------|--|
| SO-SFP-1000BASE-T | SFP, 10/100/1000Base-T Copper Interface, 0-70C |
| SO-SFP-1000BASE-T-I | SFP, 10/100/1000Base-T Copper Interface, -40 to +85C ind.temp. |

Subject to change without notice.

For more information, visit smaroptics.com.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min | Max | Unit |
|-----------------------------|--------|------|-----|------|
| Storage Temperature | TS | -40 | +85 | °C |
| Supply Voltage | VCC | -0.5 | 3.6 | V |
| Operating Relative Humidity | | | 95 | % |

RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Min | Typ | Max | Unit | |
|----------------------------|--------|---------------------|--------|------|------|----|
| Case Operating Temperature | T_c | SO-SFP-1000BASE-T | 0 | | +70 | °C |
| | | SO-SFP-1000BASE-T-I | -40 | | +85 | |
| Power Supply Voltage | Vcc | 3.15 | 3.3 | 3.45 | V | |
| Power Supply Current | Icc | | | 300 | mA | |
| Data rate | GBE | | 1.25 | | | |
| | FE | | 100mbs | | | |

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|--------------------------------|----------|-----|-----|---------|------|----------------------|
| LVPECL Inputs(Differential) | V_{IN} | 500 | | 2000 | mVpp | AC coupled inputs |
| Input Impedance (Differential) | Z_{IN} | 85 | 100 | 115 | mV | Rin > 100 kohms @ DC |
| TX Disable | Disable | 2 | | Vcc | V | |
| | Enable | 0 | | 0.8 | | |
| TX FAULT | Fault | 2 | | Vcc+0.3 | V | |
| | Normal | 0 | | 0.5 | | |

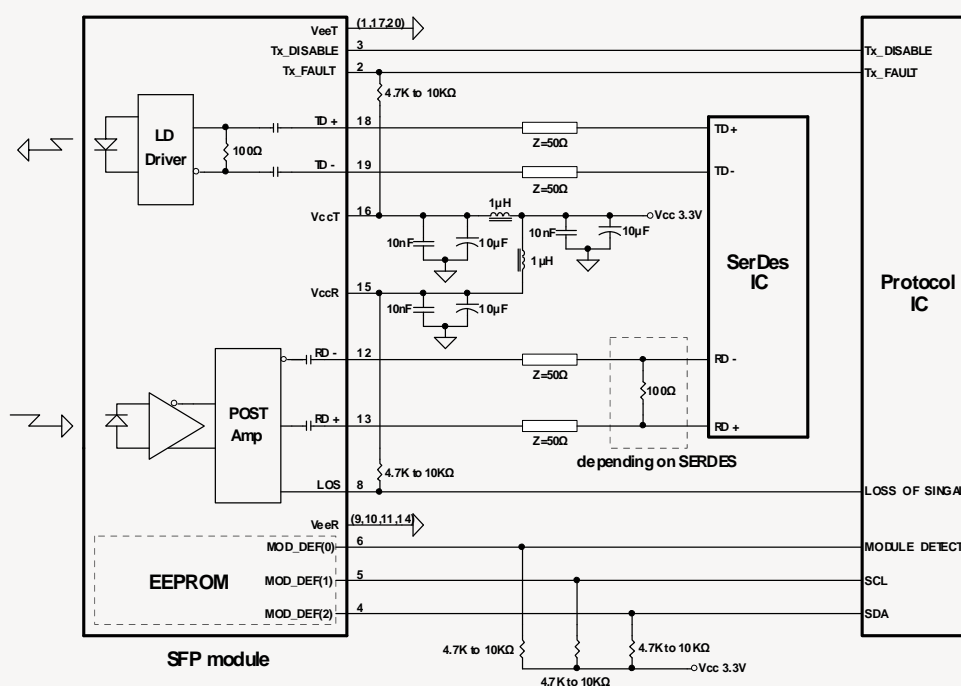
PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---------------------------------|--------|-----|-----|---------|------|--------------------|
| LVPECL Outputs (Differential) | Vout | 370 | | 2000 | mVpp | AC coupled outputs |
| Output Impedance (Differential) | Zout | 85 | 100 | 115 | ohms | |
| Rx_LOS Output Voltage – High | | 2 | | Vcc+0.3 | V | |
| Rx_LOS Output Voltage – Low | | 0 | | 0.8 | V | |
| MOD_DEF (2:0) | VoH | 2.5 | | | V | With Serial ID |
| | VoL | 0 | | 0.5 | V | |

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

| Parameter | Symbol | Min | Typ | Max | Unit |
|----------------------|-------------|-----|-----|-----|------|
| Centre Wavelength | λ_c | 760 | | 860 | nm |
| Receiver Sensitivity | P_{min} | | | -17 | dBm |
| Receiver Overload | P_{max} | -3 | | | dBm |
| Return Loss | | 12 | | | dB |
| LOS De-Assert | LOSD | | | -18 | dBm |
| LOS Assert | LOSA | -35 | | | dBm |
| LOS Hysteresis | | 1 | | | dB |

RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

| PIN | Signal Name | Description | PIN | Signal Name | Description |
|-----|-------------------|--|-----|-------------------|-----------------------------|
| 1 | V _{EE} T | Transmitter Signal Ground | 11 | V _{EE} R | Receiver Signal Ground |
| 2 | TX_Fault | Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation | 12 | RD- | Inverse Receiver Data Out |
| 3 | TX_Disable | Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on. | 13 | RD+ | Receiver Data Out |
| 4 | SDA | Modulation Definition 2 – Two wires serial ID Interface | 14 | V _{EE} R | Receiver Signal Ground |
| 5 | SDL | Modulation Definition 1 – Two wires serial ID Interface | 15 | V _{CC} R | Receiver Power – 3.3V±5% |
| 6 | MOD-ABS | Modulation Definition 0 – Ground in Module | 16 | V _{CC} T | Transmitter Power – 3.3V±5% |
| 7 | RS0 | RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance. | 17 | V _{EE} T | Transmitter Signal Ground |
| 8 | RX_LOS | Loss of Signal Out (OC). | 18 | TD+ | Transmitter Data In |
| 9 | RS1 | TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance. | 19 | TD- | Inverse Transmitter Data In |
| 10 | V _{EE} R | Receiver Signal Ground | 20 | V _{EE} T | Transmitter Signal Ground |

MECHANICAL DRAWING

