

10GBASE-T SFP+ Copper RJ-45 30m Transceiver

SFP-10G-T-LL



Application

- 10GBASE-T 10G Ethernet

Features

- Hot-pluggable SFP footprint
- Support 10GBASE-T
- Compact RJ-45 connector assembly
- Commercial Temperature Range: 0 to 70° C
- Single +3.3V power supply
- 10 Gigabit Ethernet over Cat6a/Cat7 cable
- RoHS compliant and lead-free

Description

10GBASE-T standards as specified in IEEE Std 802.3. 10GBASE-T SFP+ copper transceivers use the SFP's

RX_LOS pin for link indication. If pull up SFP's TX_DISABLE pin, PHY GBASE-T SFP+ copper transceivers are based on the SFP Multi-Source Agreement (MSA). They are compatible with the 10GBASE-T / IC will be reset.

Product Specifications

I.General Specifications

| Parameter | Symbol | Min | Typ. | Max | Unit | Notes/Conditions |
|-----------------|--------|-----|------|-----|--------|---|
| Bit Rate | BR | 1 | | 10 | Gb/sec | IEEE 802.3 compatible. See Notes 1 below |

Note:

1. Clock tolerance is +/- 50 ppm

II. Environmental Specifications

| Parameter | Symbol | Min | Typ. | Max | Unit | Notes/Conditions |
|------------------------------|--------|-----|------|-----|------|---------------------|
| Operating Temperature | Top | 0 | | 70 | ° C | Case temperature |
| Storage Temperature | Tsto | -40 | | 85 | ° C | Ambient temperature |

Note:

1. Automatic crossover detection is enabled. External crossover cable is not require

III. Transmission Distances

| Standard | Cable | Reach | Host Port |
|------------------|------------|-------|-----------|
| 10GBASE-T | Cat6a/Cat7 | 30m | XFI |

IV. Electrical Characteristics

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc

Low-Speed Signals, Electronic Characteristics

| Parameter | Symbol | Min | Max | Unit | Notes/Conditions |
|------------------------|--------|----------------|----------------|------|---|
| SFP Output LOW | VOL | 0 | 0.5 | V | 4.7k to 10k pull-up to host_Vcc, measured at host side of connector |
| SFP Output HIGH | VOH | host_Vcc - 0.5 | host_Vcc + 0.3 | V | 4.7k to 10k pull-up to host_Vcc, measured at host side of connector |
| SFP Input LOW | VIL | 0 | 0.8 | V | 4.7k to 10k pull-up to Vcc, measured at SFP side of connector |
| SFP Input HIGH | VIH | 2 | Vcc + 0.3 | mV | 4.7k to 10k pull-up to Vcc, measured at SFP side of connector |

V. +3.3V Volt Electrical Power Interface

The SFP-10G-T has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

| Parameter | Symbol | Min | Typ. | Max | Unit | Notes/Conditions |
|------------------------|--------------------|------|------|------|------|--|
| Supply Current | I _s | | 700 | 900 | mA | 3.0W max power over full range of voltage and temperature. See caution note below. |
| Input Voltage | V _{cc} | 3.13 | 3.3 | 3.47 | V | Referenced to GND |
| Maximum Voltage | V _{max} | | | 4 | V | 1 |
| Surge Current | I _{surge} | | TBD | | mA | Hot plug above steady state current. See caution note below. |

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA.

VI. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

| Parameter | Symbol | Min | Typ. | Max | Unit | Notes/Conditions |
|-----------|--------|-----|------|-----|------|------------------|
|-----------|--------|-----|------|-----|------|------------------|

High-Speed Electrical Interface, Transmission Line-SFP

| | | | | | | |
|----------------------------|---------|--|-----|--|-----|---|
| Line Frequency | fL | | 125 | | MHz | 5-level encoding, perIEEE 802.3 |
| Tx Output Impedance | Zout,TX | | 100 | | Ohm | Differential, for allfrequencies between1MHz and 125MHz |
| Rx Input Impedance | Zin,RX | | 100 | | Ohm | Differential, for allfrequencies between1MHz and 125MHz |

High-Speed Electrical Interface, Host-SFP

| | | | | | | |
|--------------------------------------|----------|-----|-----|------|------|--------------|
| Single ended data inputswing | Vinsing | 250 | | 1200 | mV | Single ended |
| Single ended data outputswing | Voutsing | 350 | | 800 | mV | Single ended |
| Rise/Fall Time | Tr,Tf | | 175 | | psec | 20%-80% |
| Tx Input Impedance | Zin | | 50 | | Ohm | Single ended |
| Rx Output Impedance | Zout | | 50 | | Ohm | Single ended |

VII. Serial Communication Protocol

All longline.COM SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

| Parameter | Symbol | Min | Typ. | Max | Unit | Notes/Condi ons |
|-----------|--------|-----|------|-----|------|--------------------|
|-----------|--------|-----|------|-----|------|--------------------|

Serial Bus Timing, Requirements

| | | | | | | |
|----------------------------------|--|---|--|---------|----|--|
| I²C Clock Rate | | 0 | | 200,000 | Hz | |
|----------------------------------|--|---|--|---------|----|--|

VIII. Pin Description

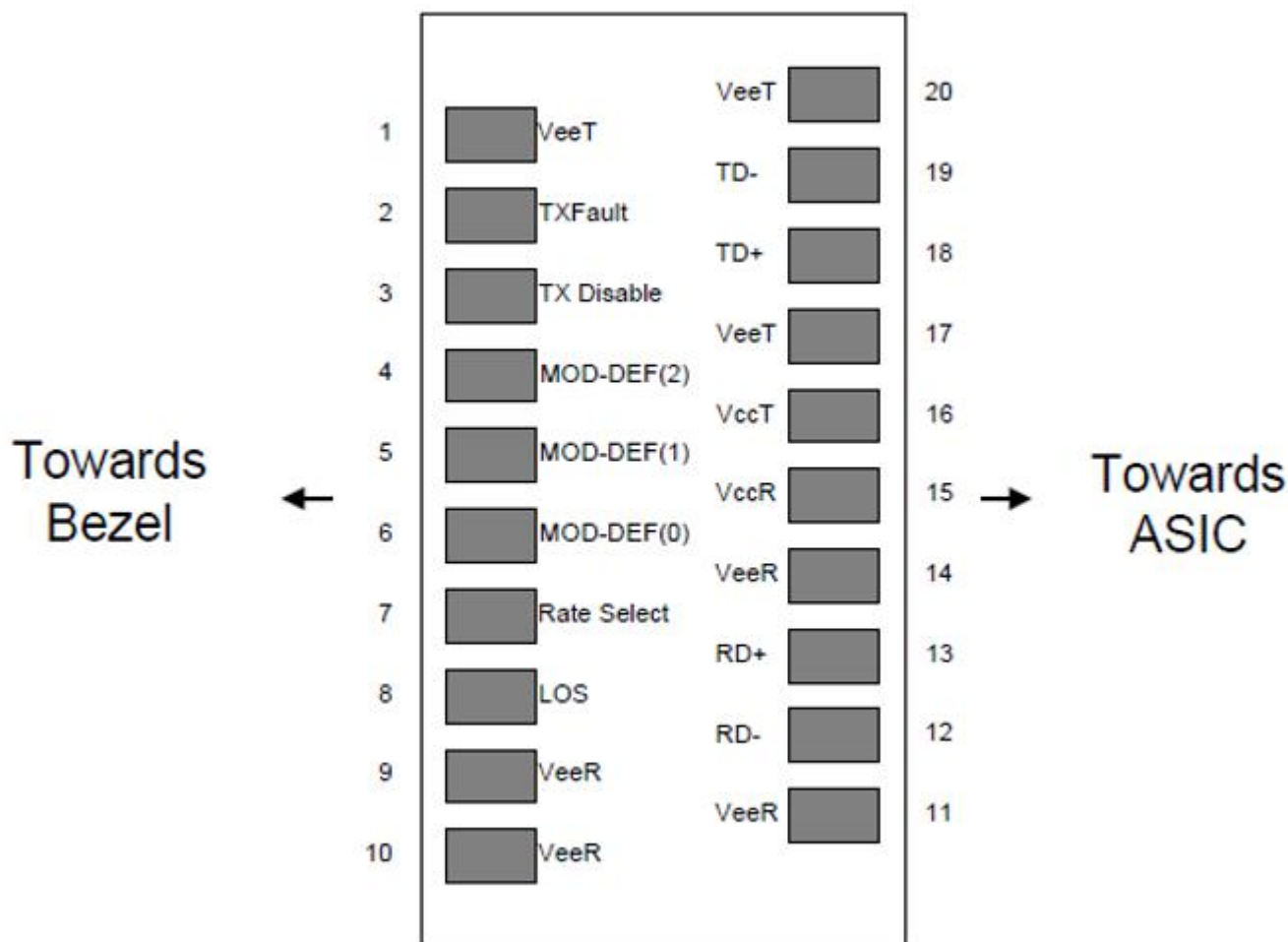


Figure 1. Diagram of Host Board Connector Block Pin Numbers and Names.

| Pin | Symbol | Name/Description | Ref. |
|-----|-------------|---|------|
| 1 | V_{EET} | Transmitter Ground(Common with Receiver Ground) | 1 |
| 2 | T_{FAULT} | Transmitter Fault. Not supported. | |
| 3 | T_{DIS} | Transmitter Disable. Laser output disabled on high or open. | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 3 |

| | | | |
|----|------------------|--|---|
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 3 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | High indicates no linked. low indicates linked. | 4 |
| 9 | V _{EER} | Receiver Ground(Common with Transmitter Ground) | 1 |
| 10 | V _{EER} | Receiver Ground(Common with Transmitter Ground) | 1 |
| 11 | V _{EER} | Receiver Ground(Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled. | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled. | |
| 14 | V _{EER} | Receiver Ground(Common with Transmitter Ground) | 1 |
| 15 | V _{CCR} | Receiver Power Supply | |
| 16 | V _{CCT} | Transmitter Power Supply | |
| 17 | V _{EET} | Transmitter Ground(Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. | |
| 20 | V _{EET} | Transmitter Ground(Common with Receiver Ground) | 1 |

Notes:

- 1.Circuit ground is connected to chassis ground
- 2.PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
- 3.Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.
- 4.LVTTL compatible with a maximum voltage of 2.5V.

IX. Mechanical Specifications

