

10GBASE-T SFP+ Transceiver

Hot Pluggable, RJ-45, Active Copper SFP+, 30M, I-Temp

Part Number: FSPP-HJ-T11-Y3i



Overview

The FSPP-HJ-T11-Y3i Small Form Factor Pluggable SFP+ Copper transceivers are compliant with the current SFP+ Multi-Source Agreement (MSA) Specification. The High performance designed is integrated full duplex data link at 10Gbps over four pair Category 6a/7 cable up to 30m links. It is specifically designed for high speed communication links that require 10 Gigabit Ethernet over copper cable in Industrial Temperature(-40~+85°C) applications.

Applications

- 10GBASE--T Application

Features

- Compliant with IEEE 802.3an
- Compliant with SFF-8431, SFF-8432 SFP+ MSA
- Support 10GBASE-T only
- Hot Pluggable
- Auto-detect MDI/MDI-X
- Support RX_LOS function
- I2C 2-wire interface for serial ID
- RJ-45 connector
- Single +3.3V power supply
- 10G link length up to 30m with Cat.6a/7
- Operating Temperature -40~+85°C
- RoHS Compliant

Absolute Maximum Ratings

| Parameters | Symbol | Min. | Max. | Unit |
|---------------------------|-----------------|------|------|------|
| Storage Temperature | T _{ST} | -40 | +85 | °C |
| Storage Relative Humidity | RH | 5 | 95 | % |
| Supply Voltage | V _{CC} | -0.5 | +4.0 | V |



Recommended Operating Conditions

| Parameters | Symbol | Min. | Typ. | Max. | Unit |
|----------------------------|--------------------|-------|---------|-------------------|------|
| Case Operating Temperature | T _{OP} | -40 | - | +85 | °C |
| Supply Voltage | V _{CC} | +3.13 | +3.3 | +3.47 | V |
| Maximum Voltage | V _{max} | | | 4 | V |
| Data Rate | DR | | 10.3125 | | Gb/s |
| Bit Error Rate | BER | | | 10 ⁻¹² | |
| Supply Current | I _{CC} | | | 750 | mA |
| Surge Current | I _{surge} | | | 30 | mA |
| Power Consumption | P | | | 2.5 | W |

Note1: Power consumption and surge current are higher than the specified values in the SFP MSA.

High-Speed Electrical Interface, Host to SFP+

V_{CC} = 3.13V to 3.47V, T_{OP} = -40 °C to 85 °C

| Parameters | Symbol | Min. | Typ. | Max. | Unit | Note |
|-------------------------------|---------------------------------------|------|------|------|------|------|
| TD+, TD- Input Voltage Swing | V _{IN+} / V _{IN-} | 250 | | 1200 | mV | 1 |
| RD+, RD- Output Voltage Swing | V _{out+} / V _{out-} | 350 | | 800 | mV | 1 |
| Rise/Fall Time (20%~80%) | Tr/Tf | | 175 | | ps | |
| Tx Input Impedance | Z _{in} | | 50 | | Ohm | 1 |
| Rx Output Impedance | Z _{out} | | 50 | | Ohm | 1 |

Note1: Single ended.

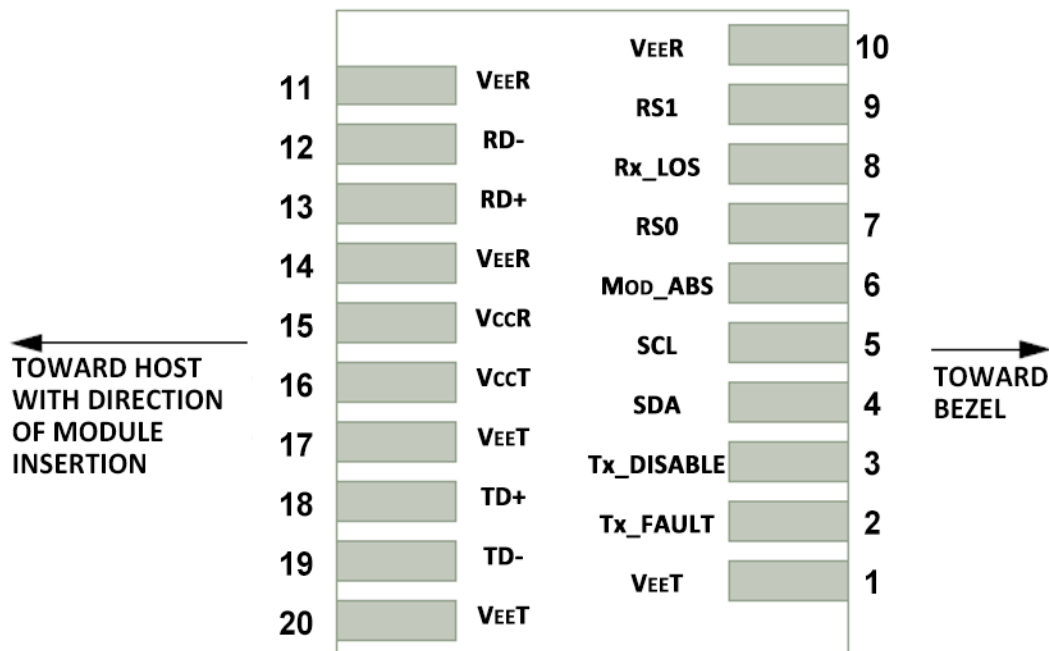
High-Speed Electrical Interface, Cable to SFP+

V_{CC} = 3.13V to 3.47V, T_{OP} = -40 °C to 85 °C

| Parameters | Symbol | Min. | Typ. | Max. | Unit | Note |
|---------------------|---------------------|------|------|------|------|------|
| Tx Output Impedance | Z _{out.TX} | | 100 | | Ohm | |
| Rx Output Impedance | Z _{in.RX} | | 100 | | Ohm | |



Pin Assignment



Host PCB SFP+ Pad Assignment Top View

Pin Description

| Pin | Name | Function / Description |
|-----|------------|---|
| 1 | VEET | Transmitter Ground |
| 2 | Tx_FAULT | Transmitter Fault Indication (1) |
| 3 | Tx_DISABLE | Transmitter Disable – Turns off transmitter laser output (2) |
| 4 | SDA | 2-wire Serial Interface Data Line (SDA: Serial Data Signal) (3) |
| 5 | SCL | 2-wire Serial Interface Clock (SCL: Serial Clock Signal) (3) |
| 6 | MOD_ABS | Module Absent, connected to VEET or VEER in the module (3) |
| 7 | RS0 | Rate Select 0, optional (4) |
| 8 | Rx_LOS | Receiver Loss of Signal Indication (5) |
| 9 | RS1 | Rate Select 1, optional (4) |
| 10 | VEER | Receiver Ground |
| 11 | VEER | Receiver Ground |
| 12 | RD- | Receiver Inverted Data output, AC coupled |



| | | |
|----|------|---|
| 13 | RD+ | Receiver Non-Inverted Data output, AC coupled |
| 14 | VEER | Receiver Ground |
| 15 | VCCR | Receiver 3.3V Power Supply |
| 16 | VcCT | Transmitter 3.3V Power Supply |
| 17 | VEET | Transmitter Ground |
| 18 | TD+ | Transmitter Non-Inverted Data Input, AC coupled |
| 19 | TD- | Transmitter Inverted Data Input, AC coupled |
| 20 | VEET | Transmitter Ground |

Note1: Tx Fault is not used and is always tied to ground.

Note2: Tx Disable is not used.

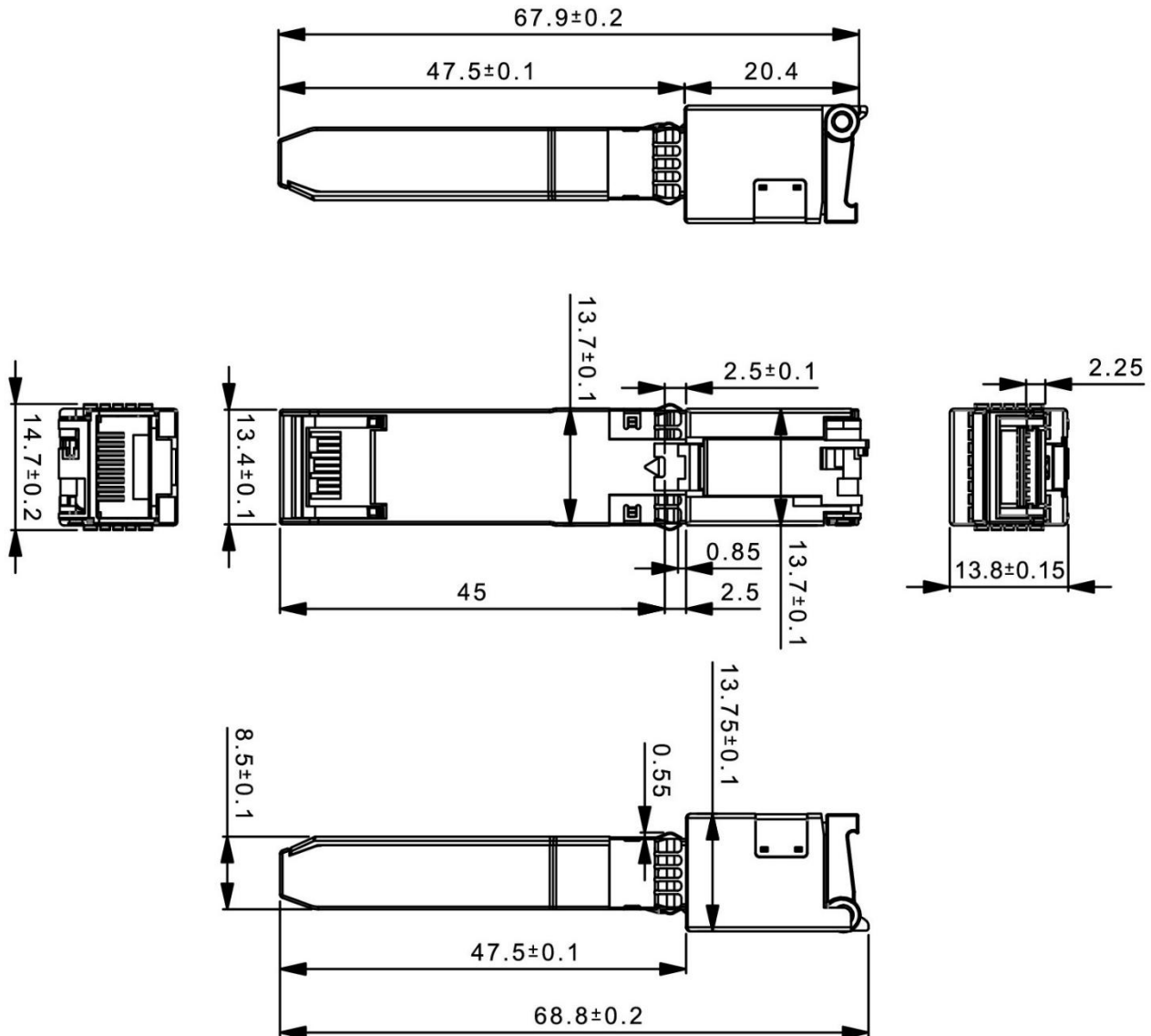
Note3: These are the module definition pins. They should be pulled up with a 4.7K~10K Ω resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.

Note4: Tied to ground through a 30K ohm resistor.

Note5: Rx_LOS (Loss of signal) is an open collector/drain output which should be pulled up externally with a 4.7K~10K Ω resistor on the host board. The Rx_LOS signal is a Copper SFP+ linkup/ link-down indicator and not a peak (AC) or voltage (DC) detector.



Mechanical Dimensions



(All Dimensions are $\pm 0.20\text{mm}$ Unless Otherwise Specified, Unit: mm)

Ordering Information

| Part No. | Host Port | Line Port Speed (RJ45) | Link | Temp. |
|-----------------|-----------|---------------------------|-----------|----------|
| FSPP-HJ-T11-Y3i | XFI | 10GBASE-T @Cat.6a/7 cable | 30 meters | -40~85°C |

Note: Distances are indicative only. To calculate a more precise link budget based on specific conditions in your application, please refer to the optical characteristics.