



125M SFP-100TX Transceiver Hot Pluggable, RJ-45, Active Copper SFP

Part Number: FSFP-AJ-Tx1-X1



Overview:

FSFP-AJ-Tx1-X1 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 125Mbps over four pair Category 5 UTP cable up to 100m links. User can be accessed SFP serial ID information with address of A0h via the 2-wire serial bus I2C protocol. This 100Base-TX Copper SFP Transceiver supports the SFP based switch 100Base-FX ports that accept standard 100Base-FX optics SFP.

Applications:

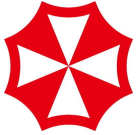
- | 10/100BASE-TX Application
- | High speed I/O for file server
- | Mass storage system I/O
- | Bus extension application

Features:

- | Compatible with IEEE802.3u Standard
- | Compliant with SFP MSA
- | Hot Pluggable
- | Auto-detect MDI/MDI-X on RJ-45 port
- | Compatible with 10BASE-T and 100BASE-TX auto-negotiation on RJ-45 port
- | Support RX_LOS(Loss Of Signal) function
- | Single +3.3V power supply
- | Link length up to 100m with four-pair Cat.5 UTP
- | 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 Temp. (FSFP-AJ-Tx1-X1) | T _{OP} | 0 | - | +70 | °C |
| Case Operating Temp. (FSFP-AJ-Tx1-X1i) | | -40 | - | +85 | °C |
| Supply Voltage | V _{CC} | +3.13 | +3.3 | +3.47 | V |
| Supply Current | I _{CC} | | | 300 | mA |

General Specifications:

| Parameters | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------|--------|------|------|-------------------|--------|------|
| Data Rate | DR | 10 | 125 | 125 | Mb/sec | |
| Bit Error Rate | BER | | | 10 ⁻¹² | | |

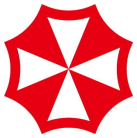
High-Speed Electrical Interface, Host to SFP:

V_{CC}= 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (FSFP-AJ-Tx1-X1); T_{OP} = -40 °C to 85 °C (FSFP-AJ-Tx1-X1i)

| 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 Time (Receiver) | T _r | | 175 | | ps | 2 |
| Fall Time (Receiver) | T _f | | 175 | | ps | 2 |
| Tx Input Impedance | Z _{in} | | 100 | | Ohm | 1 |
| Rx Output Impedance | Z _{out} | | 100 | | Ohm | 1 |

Note1: Single ended.

Note2: 20% to 80% value.



High-Speed Electrical Interface, Cable to SFP:

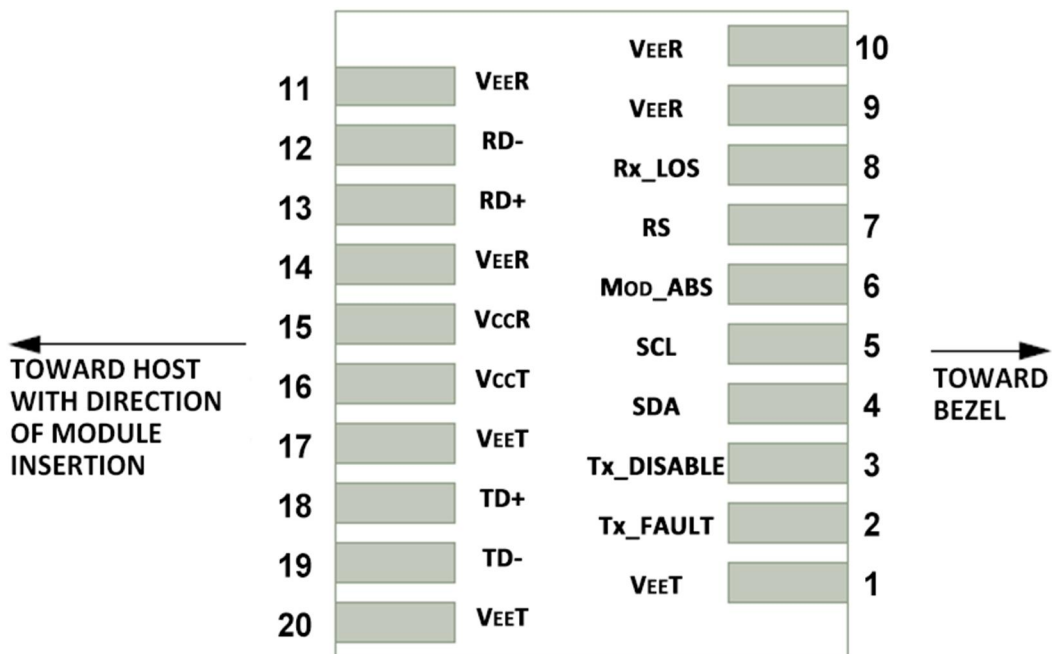
V_{CC}= 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (FSFP-AJ-Tx1-X1); T_{OP} = -40 °C to 85 °C (FSFP-AJ-Tx1-X1i)

| Parameters | Symbol | Min. | Typ. | Max. | Unit | Note |
|------------------------|---------------------|------|------|------|------|------|
| Transmission Frequency | Ft | | 125 | | MHz | 1 |
| TX Output Impedance | Z _{out.TX} | | 100 | | Ohm | 2 |
| RX Output Impedance | Z _{in.RX} | | 100 | | Ohm | 2 |

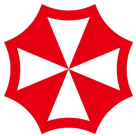
Note1: 4D-PAM-5 encoding per IEEE802.3: 2002.

Note2: Differential for frequencies ranging from 1MHz to 125MHz.

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 | RS | Rate Select, optional (5) |
| 8 | Rx_LOS | Receiver Loss of Signal Indication (4) |
| 9 | VEER | Receiver Ground |
| 10 | VEER | Receiver Ground |
| 11 | VEER | Receiver Ground |
| 12 | RD- | Receiver Inverted Data output, Differential LVPECL, AC coupled |
| 13 | RD+ | Receiver Non-Inverted Data output, Differential LVPECL, 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, Differential LVPECL, AC coupled |
| 19 | TD- | Transmitter Inverted Data Input, Differential LVPECL, AC coupled |
| 20 | VEET | Transmitter Ground |

Note1: TX Fault is not used and is always tied to ground through a 100 ohm resistor.

Note2: TX Disable as described in the MSA is not applicable to the 1000BASE-T module, but is used for convenience as an input to reset the internal PHY IC. This pin is pulled up within the module with a 4.7K Ω resistor.

? Low (0 – 0.8 V): Transceiver on; Between (0.8 V and 2.0 V): Undefined

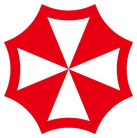
? High (2.0 – 3.465 V): Transceiver in reset state

? Open: Transceiver in reset state

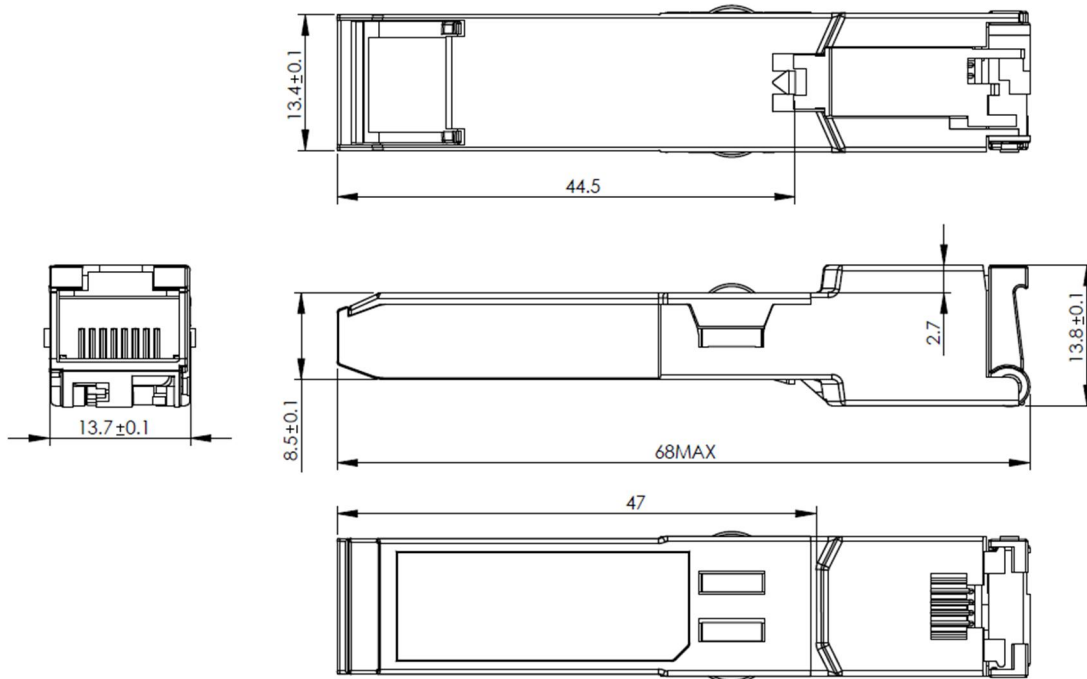
Note3: These are the module definition pins. They should be pulled up with a 4.7K~10K Ω resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.

Note4: 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 to supply <VccT+0.3V or VccR+0.3V. When high, this output indicates the received optical power is below the worst case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to <0.8V.

Note5: No connect on this module.



Mechanical Dimensions:



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

Ordering Information:

| Part No. | RJ-45 side Speed mode | Host side Operation mode | Link Indicator on Rx_LOS pin | Temp. |
|-----------------|-----------------------|--------------------------|------------------------------|----------|
| FSFP-AJ-T11-X1 | 10/100M | 100BASE-FX | Yes | 0~70°C |
| FSFP-AJ-T11-X1i | 10/100M | 100BASE-FX | Yes | -40~85°C |
| FSFP-AJ-T01-X1 | 100M | 100BASE-FX | Yes | 0~70°C |
| FSFP-AJ-T01-X1i | 100M | 100BASE-FX | Yes | -40~85°C |