



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

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)	T _{OP}	-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

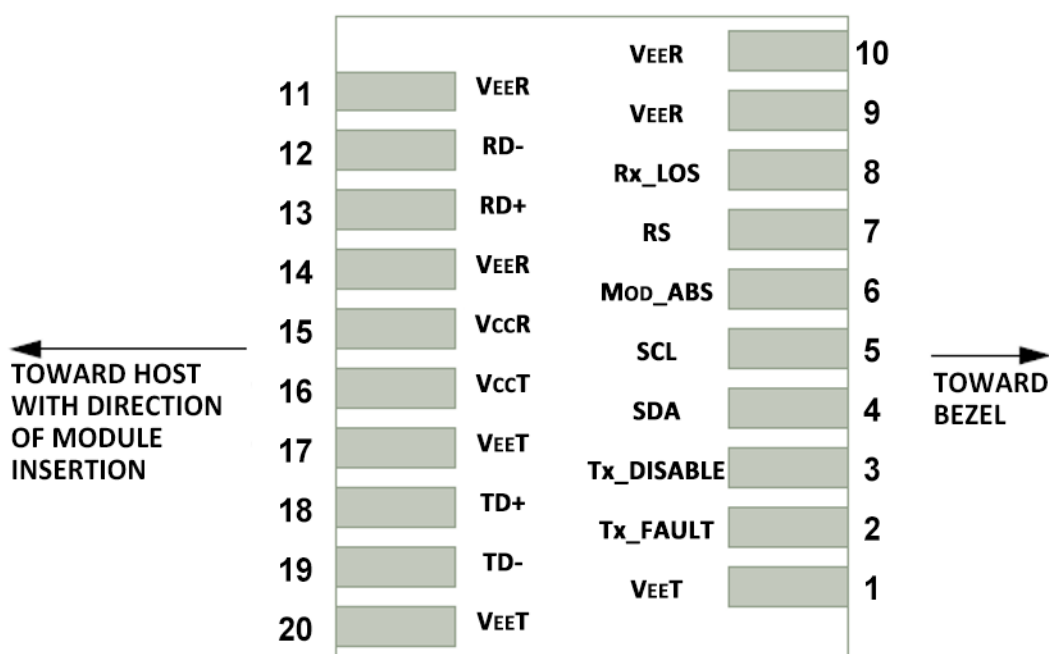
$V_{CC} = 3.13V$ to $3.47V$, $T_{OP} = 0^{\circ}C$ to $70^{\circ}C$ (FSFP-AJ-Tx1-X1); $T_{OP} = -40^{\circ}C$ to $85^{\circ}C$ (FSFP-AJ-Tx1-X1i)

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

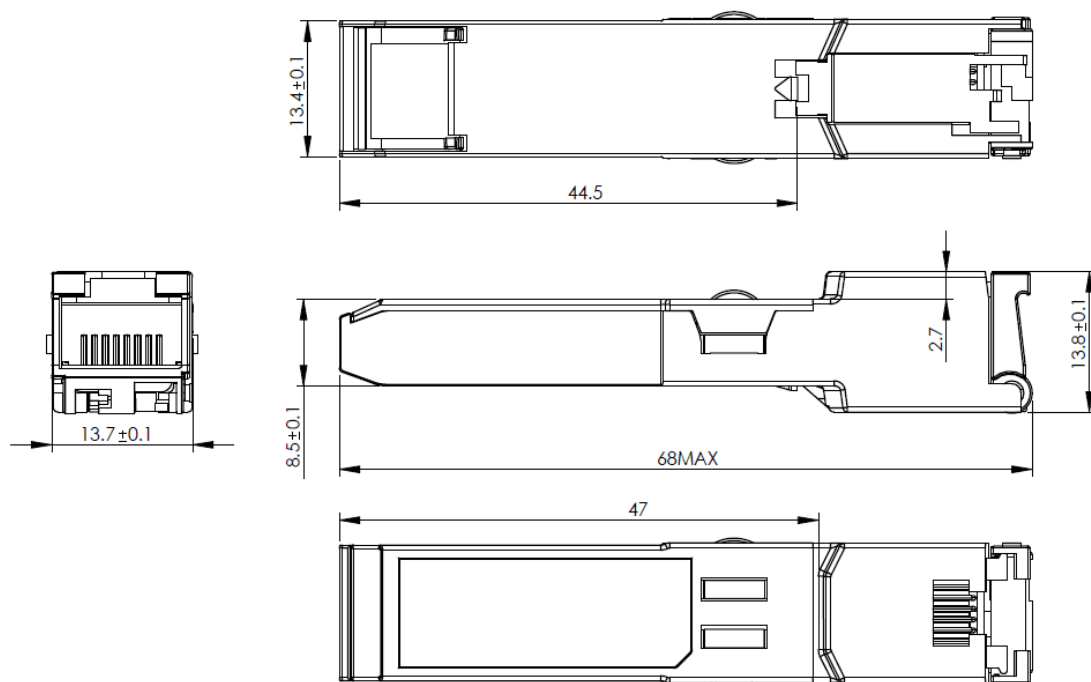
Note3: These are the module definition pins. They should be pulled up with a 4.7K~10K Ω resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.

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