



## 10GBASE-T SFP+ Transceiver Hot Pluggable, RJ-45, Active Copper SFP+, 30M

**Part Number:** FSPH-HJ-Txx-Y3



### Overview:

The FSPH-HJ-Txx-Y3 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.

### Applications:

- 1G / 2.5G / 5G / 10GBASE-T Application

### Features:

- Compliant with IEEE 802.3an, 802.3ab and 802.3z
- Compliant with SFF-8431, 8432 SFP+ MSA
- Support 10GBASE-T/ 5GBASE-T/ 2.5GBASE-T/ 1000BASE-T/ 100BASE-TX
- Hot Pluggable
- Auto-negotiates with other 10GBASE-T PHYs
- 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, 2.5G/5G link length up to 50m with Cat.5E, 100M/1G link length up to 100m with Cat.5E
- RoHS Compliant

### Absolute Maximum Ratings:

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T <sub>ST</sub>	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	V <sub>CC</sub>	-0.5	+4.0	V



**Recommended Operating Conditions:**

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature	T <sub>OP</sub>	0	-	+70	°C
Supply Voltage	V <sub>CC</sub>	+3.13	+3.3	+3.47	V
Maximum Voltage	V <sub>max</sub>			4	V
Data Rate	DR		10.3125		Gb/s
Bit Error Rate	BER			10 <sup>-12</sup>	
Supply Current	I <sub>CC</sub>		700	750	mA
Surge Current	I <sub>surge</sub>			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<sub>CC</sub>= 3.13V to 3.47V, T<sub>OP</sub> = 0 °C to 70 °C

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

**Note1:** Single ended.

**High-Speed Electrical Interface, Cable to SFP+:**

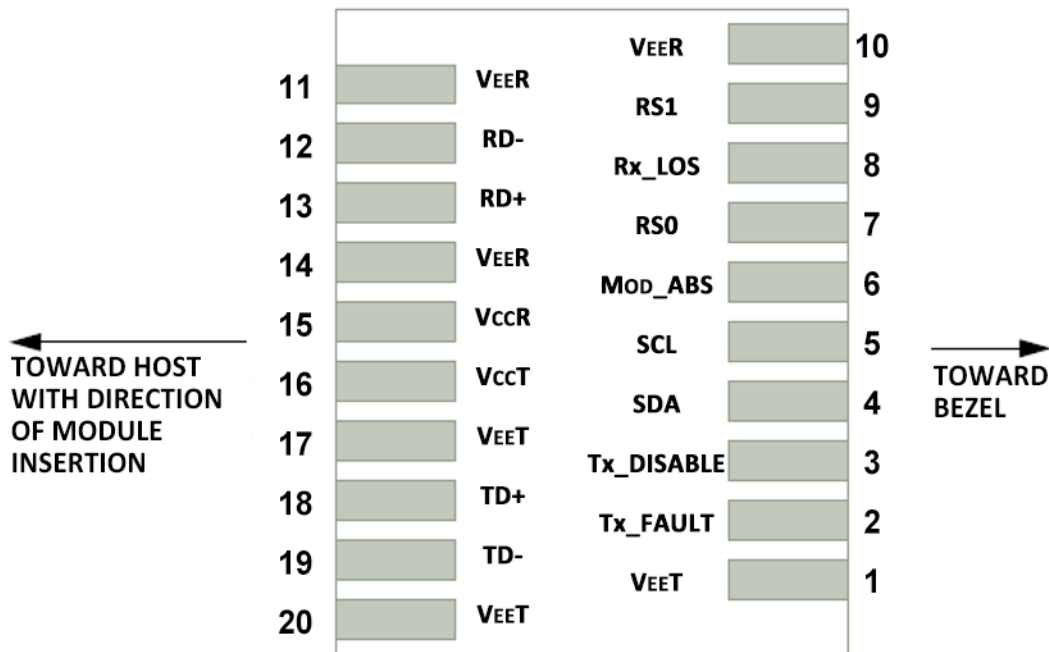
V<sub>CC</sub>= 3.13V to 3.47V, T<sub>OP</sub> = 0 °C to 70 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
TX Output Impedance	Z <sub>out.TX</sub>		100		Ohm	1
RX Output Impedance	Z <sub>in.RX</sub>		100		Ohm	1

**Note1:** Differential for frequencies ranging from 125MHz to 10.3125GHz.



**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 (4)
4	SDA	2-wire Serial Interface Data Line (SDA: Serial Data Signal) (2)
5	SCL	2-wire Serial Interface Clock (SCL: Serial Clock Signal) (2)
6	MOD_ABS	Module Absent, connected to VEET or VEER in the module (2)
7	RS0	Rate Select 0, optional (4)
8	Rx_LOS	Receiver Loss of Signal Indication (3)
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	VCC T	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 through a 100 ohm resistor.

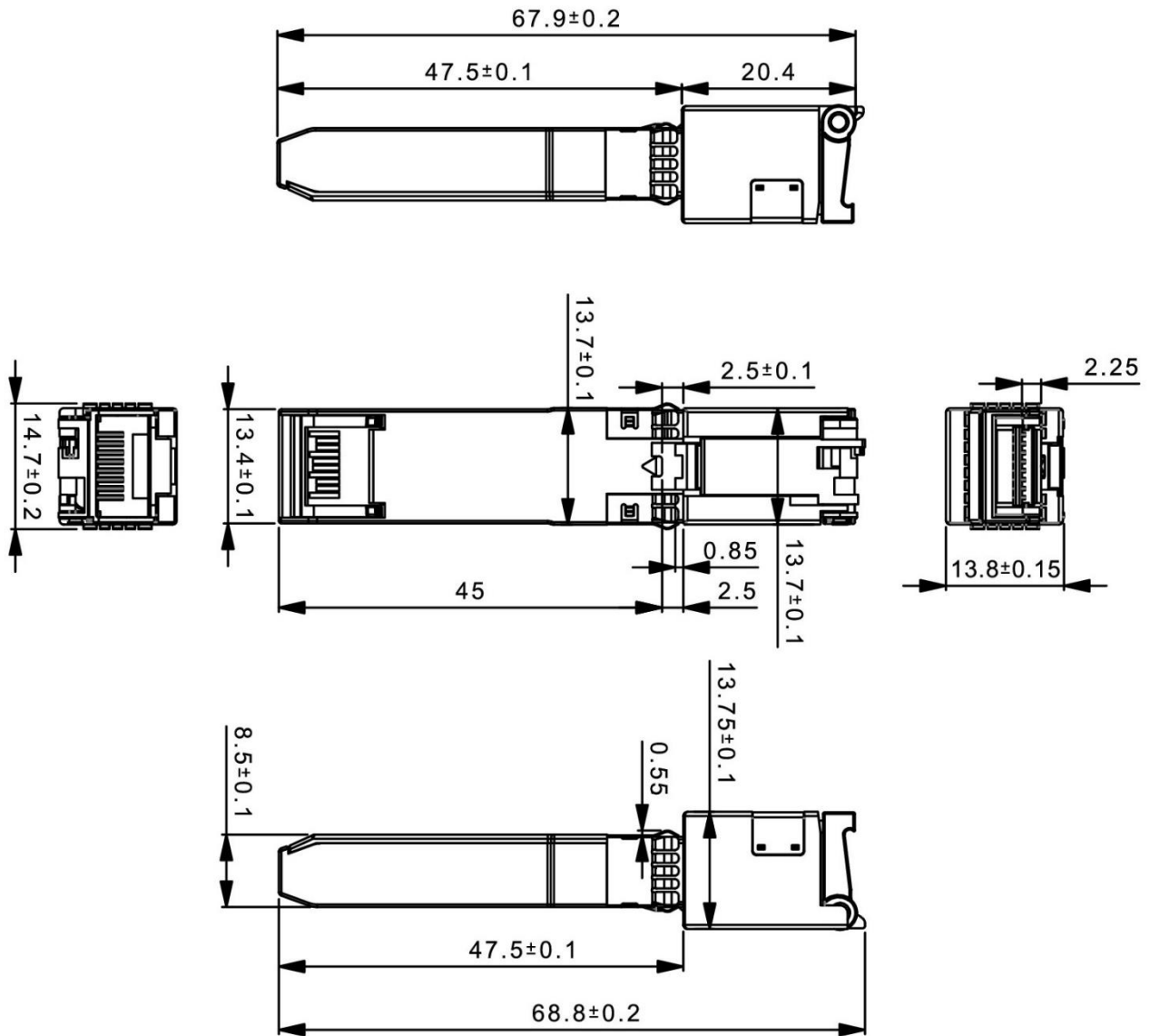
**Note2:** These are the module definition pins. They should be pulled up with a 4.7K~10KΩ resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD\_ABS is grounded by the module to indicate that the module is present.

**Note3:** Rx\_LOS (Loss of signal) is an open collector/drain output which should be pulled up externally with a 4.7K~10KΩ 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.

**Note4:** No connect on this module.



**Mechanical Dimensions:**



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



**Ordering Information:**

Part No.	Host Port	Line Port Speed (RJ45)	Link	Temp.
FSPH-HJ-T11-Y3	XFI	10GBASE-T @Cat.6a/7 cable	30 meters	0~70°C
FSPH-HJ-T12-Y3	XFI	10GBASE-T @Cat.6a/7 cable	30 meters	0~70°C
		5GBASE-T @Cat.5E cable	50 meters	
		2.5GBASE-T @Cat.5E cable	50 meters	
		1000BASE-T @Cat.5E cable	100 meters	
		100BASE-TX @Cat.5E cable	100 meters	
FSPH-HJ-T22-Y3	XFI	10GBASE -T @Cat.6a/7 cable	30 meters	0~70°C
	5GBASE-R	5GBASE -T @Cat.5E cable	50 meters	
	2.5GBASE-X	2.5GBASE -T @Cat.5E cable	50 meters	
	1000BASE-X	1000BASE -T @Cat.5E cable	100 meters	