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

Part Number: FSPP-HJ-Txx-Y3

Overview

The FSPP-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, SFF-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_{ST}	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	V_{CC}	-0.5	+4.0	V

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Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature	T_{OP}	0	-	+70	°C
Supply Voltage	V_{CC}	+3.13	+3.3	+3.47	V
Maximum Voltage	Vmax			4	V
Data Rate	DR		10.3125		Gb/s
Bit Error Rate	BER			10^{-12}	
Supply Current	I_{CC}		700	750	mA
Surge Current	Isurge			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	Zin		50		Ohm	1
Rx Output Impedance	Zout		50		Ohm	1

Note1: Single ended.

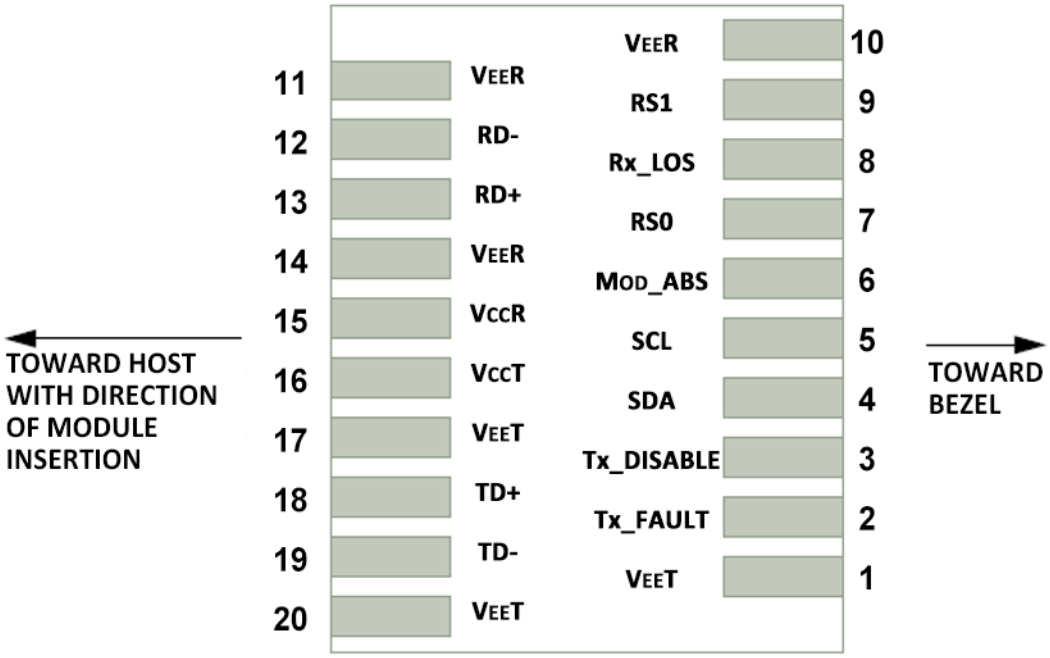
High-Speed Electrical Interface, Cable to SFP+

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	1
Rx Output Impedance	$Z_{in.}$RX		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 (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

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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~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.

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~10KΩ 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.

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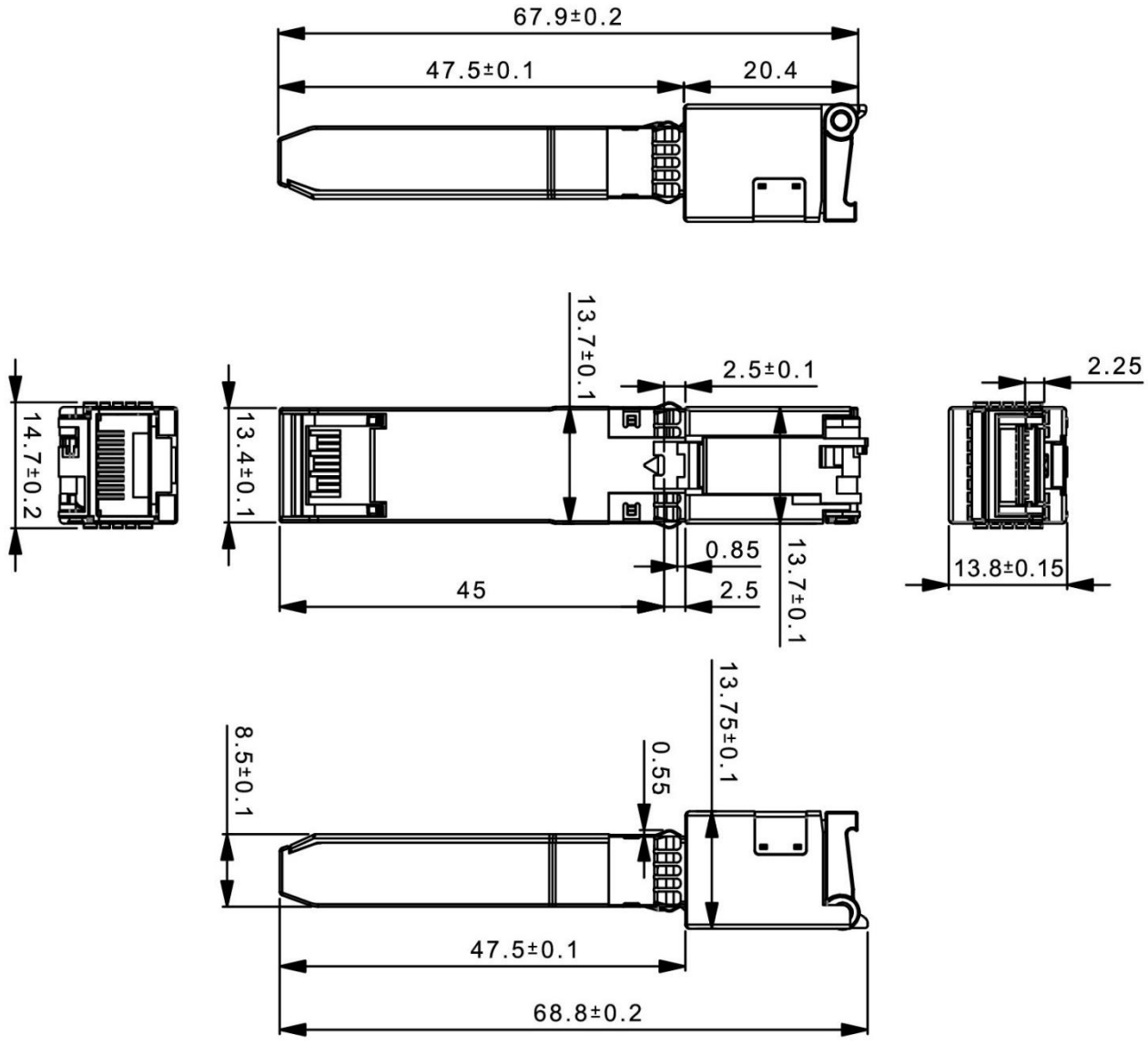
Mechanical Dimensions



(All Dimensions are ±0.20mm Unless Otherwise Specified, Unit: mm)

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Ordering Information

Part No.	Host Port	Line Port Speed (RJ45)	Link	Temp.
FSPP-HJ-T11-Y3	XFI	10GBASE-T @Cat.6a/7 cable	30 meters	0~70°C
FSPP-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	
FSPP-HJ-T22-Y3 (Note1)	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	

Note1: The speed of host port is based on the negotiated speed of line port (RJ45).