

10GBASE-T Copper 30m SFP Optical Transceiver Module

S-FP10R3M-C

Features

- Supports Links up to 30m using Cat 6A Cable
- SFF-8431 and SFF-8432 MSA Compliant
- IEEE 802.3az and 802.3an Compliant
- IEEE 802.3bz for 5G&2.5G BASE-T
- Hot-pluggable SFP footprint
- TX Disable and RX Los function
- Fully metallic enclosure for Low EMI Emissions
- +3.3V single power supply
- Low Power Consumption (2.5W MAX @ 30m)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- XFII/5GBASE-R/2500BASE-X/SGMII, SGMII Auto-Negotiation On
- Auto-negotiates with other 10GBase-T PHYs
- Supports 100/1000Base-T using Cat 5e cable or better
- MDI/MDIX Crossover
- Multiple Loopback Modes for Testing and Troubleshooting
- Built-in Cable Monitoring and Link Diagnostic
- Unshielded and Shielded cable support
- Operating case temperature range of 0°C to +70°C
- RoHS compliant (lead free)

Applications

- 10Gigabit Ethernet over Cat 6A/7 cable
- 5Gigabit Ethernet over Cat 6A/7 cable
- 2.5Gigabit Ethernet over Cat 6A/7 cable
- 1.25Gigabit Ethernet over Cat 5e cable

Description

SFP-10G-T Copper Small Form Pluggable Plus(SFP+) transceivers is high performance,high reliability, cost effective module compliant with the 10 Gigabit Ethernet and 10G BASE-T standards as specified in IEEE 802. 3-2015 and IEEE 802.3an, which supporting 10Gbps data-rate up to 30 meters reach over shielded twisted-pair category 6A cable. The module supports 10Gbps full duplex data-links with 16-level Pulse Amplitude Modulation (PAM) signals. The module provides standard serial ID information compliant with SFP+ MSA, which can be accessed with address of A0h via the 2wire serial bus. The physical IC can also be accessed via 2wire serial bus at address ACh.

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Environmental specification

Parameter	Symbol	Min	Typ	Max	Units
Operating Temperature	Tc	0		+70	°C
Storage Temperature		-40		+85	°C

+3.3V Electrical Power Interface

Parameter	symbolo	Min	Typ	Max	Units	Notes/Conditions
Supply Current	Is		500	757	mA	2.5W max power over full range of vlitage and temperature.see caution note blew
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			3.6	V	

Low-speedsignals,electroniccharacteristics

Parameter	Symbol	Min	Max	Units	Notes/Conditions
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Output HIGH	VOH	host_Vcc-0.5	host_Vcc+0.3	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
SFP Input HIGH	VIH	2	Vcc+0.3	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

High-speed electrical interface, transmission line-SFP

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Line Frequency	FL		800		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Zout, Tx		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz
Rx Inout Impedance	Zin, Rx		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz

High-speed electrical interface, host-SFP

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Single ended data input swing	Vinsing	500	800	1100	mV	Differential
Single ended data output swing	Voutsing	500	800	1100	mV	Differential
Rise/Fall Time	Tr,Tf	20		47	psec	20%~80%
Tx Input Impedance	Zin		100		ohm	Differential
Tx Input Impedance	Zout		100		ohm	Differential

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General specifications

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Date Rate	BR	1		10	Gb/s	See Notes 2 through 4 below IEEE 802.3 compatible.
Cable Length	L			30	m	
Notes						
Clock tolerance is +/- 50 ppm.						

Pin Definitions

Pin Diagram

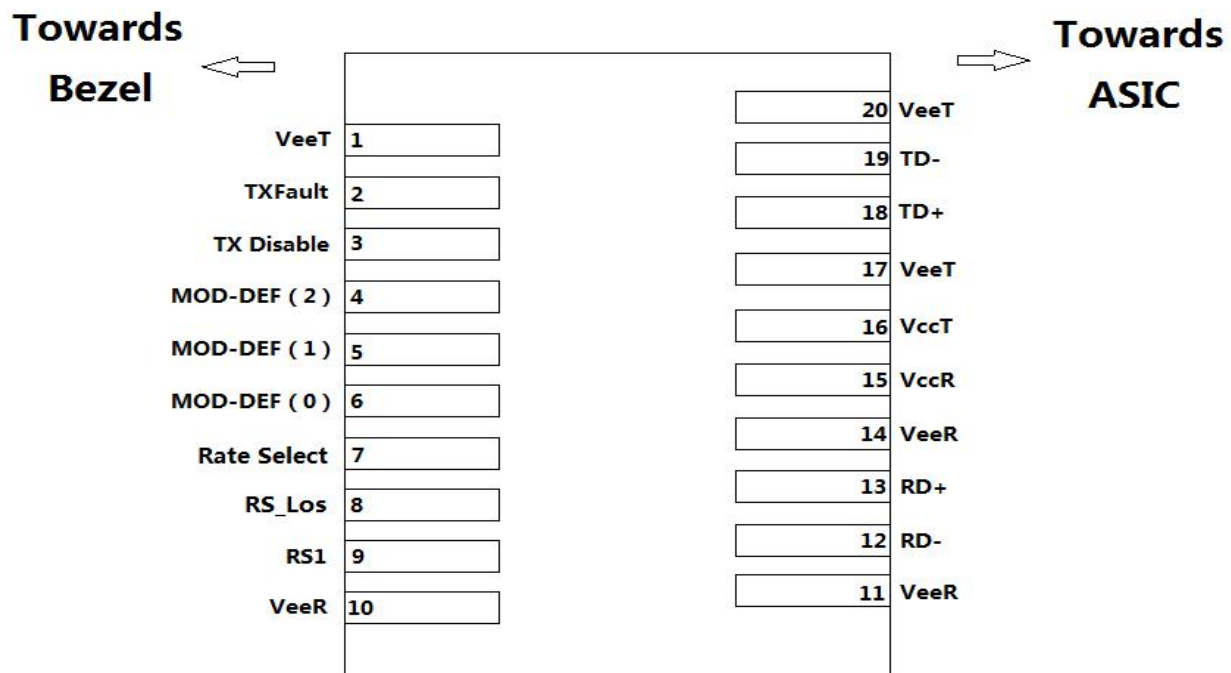


Figure 1. Pin definitions

Pin Descriptions

PIN	Symbol	Name/Description	Notes
1	VeeT	Module Transmitter Ground	1
2	TX_Fault	Module Transmitter Fault	2
3	TX_Disable	Transmitter Disable. Laser disabled output on high or open	3
4	Mod_DEF (2)	Module Definition 2. Data line for Serial ID	4
5	Mod_DEF (1)	Module Definition 1. Clock line for Serial ID	4
6	Mod_DEF (0)	Module Definition 0. Grounded within the module	4
7	Rate Select	Rate Select 0. optionally controls SFP+ module receiver	

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8	Rx_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	2
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter	1
10	VeeR	Module Receiver Ground	1
11	VeeR	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-inverted Data Output	
14	VeeR	Module Receiver Ground	1
15	VccR	Module Receiver 3.3 V Supply	
16	VccT	Module Transmitter 3.3 V Supply	
17	VeeT	Module Receiver Ground	1
18	TD+	Receiver Non-inverted Data Input	
19	TD-	Receiver Inverted Data Input	
20	VeeT	Transmitter Ground(Common with Receiver Ground)	1

Notes

- 1.The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
- 2.This contact is an open collector/drain output contact and shall be pulled up on the host. Pull ups can be connected to one of several power supplies, however the host board.
- 3.Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pull up to VccT inside the module.
- 4.Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6V.

Serial Communication Protocol

All SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

Serial Bus Timing, Requirements

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
I2C Clock Rate		0		200, 000	Hz	

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Mechanical Dimensions

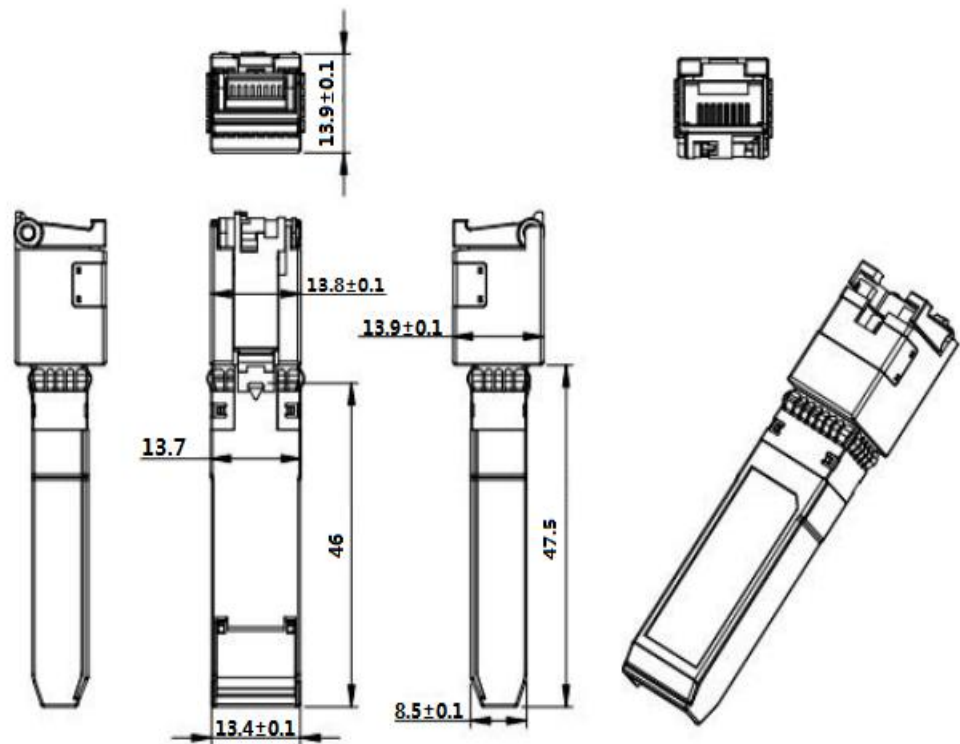


Figure 2. Mechanical dimensions

Ordering information

Part Number	Product Description
S-FP10R3M-C	SFP, 10Gb/s,Copper, RJ45 ,30M, 0°C~+70°C