



TECHNICAL DATA SHEET FOR 10GBPS COPPER SFP+
(SFP-10G-T)

Hangzhou RunZhou Fiber Technologies Co., Ltd
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1. Product Features

- Supports Links up to 30m using Cat 6A Cable RJ-45 connector assembly
- SFF-8431 and SFF-8432 MSA Compliant
- IEEE 802.3az and 802.3an Compliant
- IEEE 802.3bz for 5G&2.5G BASE-T
- TX Disable and RX Los function
- Fully metallic enclosure for Low EMI Emissions
- +3.3V single power supply & hot-pluggable SFP+ footprint
- Low Power Consumption (2.5W MAX @ 30m)
- Access to physical layer IC via 2-wire serial bus
- XFI/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

2. Applications

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

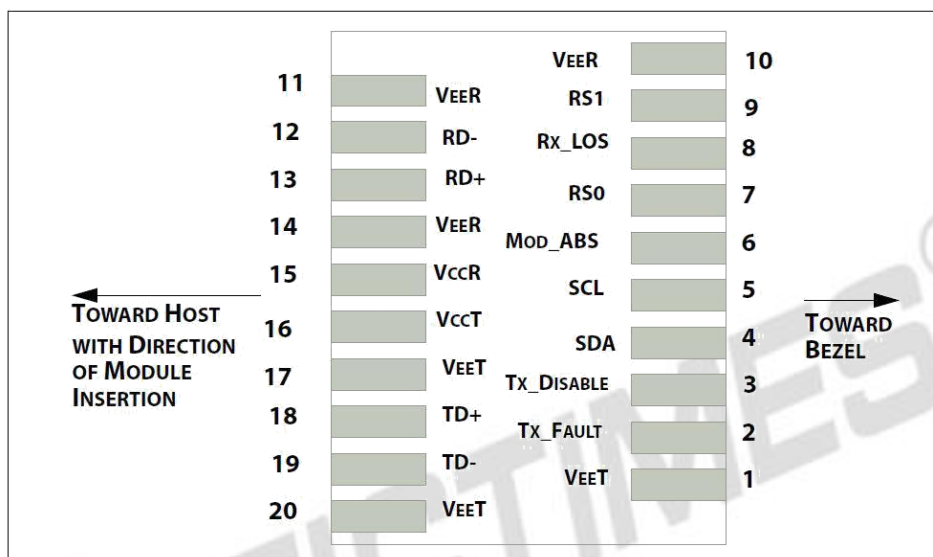
3. Cable Length

Standard	Cable	Reach	Host Port
10Gbase-T	CAT6A	30m	XFI
5Gbase-T/2.5Gbase-t	CAT5E	50m	5GBase-R/2.5GBase-X
1000base-T	CAT5E	100m	1000base-FX

4. Description

SFP-10G-T Copper Small Form Pluggable Plus (SFP+) transceivers is high performance, 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.

5. Pin Definitions



6. Pin Descriptions

Pin	Signal Name	Description	Notes
1	VeeT	Module Transmitter Ground	1
2	Tx_Fault	Module Transmitter Fault	2
3	Tx_Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)	
5	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)	
6	Mod_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	
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	
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 Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VeeT	Module Transmitter Ground	1

Note:

- 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 4.7kΩ to 10kΩ pull up to VccT inside the module.

7. Electrical Power Interface

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Current	I _s		500	757	mA	
Input Voltage	V _{CC}	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	V _{max}			3.6	V	

8. Low-speed signals, electronic characteristics

Parameter	Symbol	Min.	Max.	Unit	Note
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	
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	

9. High-speed electrical interface, transmission line-SFP+

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Line Frequency	f _L		800		MHz	16-level encoding, per IEEE 802.3
Tx Output Impedance	Z _{out,TX}		100		Ohm	Differential, for all Frequencies between 1MHz and 800MHz
Rx Input Impedance	Z _{in,RX}		100		Ohm	

10. High-speed electrical interface, host-SFP+

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Single Ended Data Input Swing	Vinsing	500	800	1100	mV	
Single Ended Data Output Swing	Voutsing	500	800	1100	mV	
Rise/Fall Time	Tr,Tf	25		47	ps	20%-80%
Tx Input Impedance	Zin		100		Ohm	Differential
Rx Output Impedance	Zout		100		Ohm	Differential

11. General specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Data Rate	BR	1		10	Gbps	IEEE 802.3 compatible.
Cable Length	L			30	m	Category 6A STP. BER <10 ⁻¹²

Notes:

- 1.Clock tolerance is +/- 50 ppm
- 2.By default, the YSP96-T is a full duplex device in preferred master mode
- 3.Automatic crossover detection is enabled. External crossover cable is not required

12. Environmental specifications

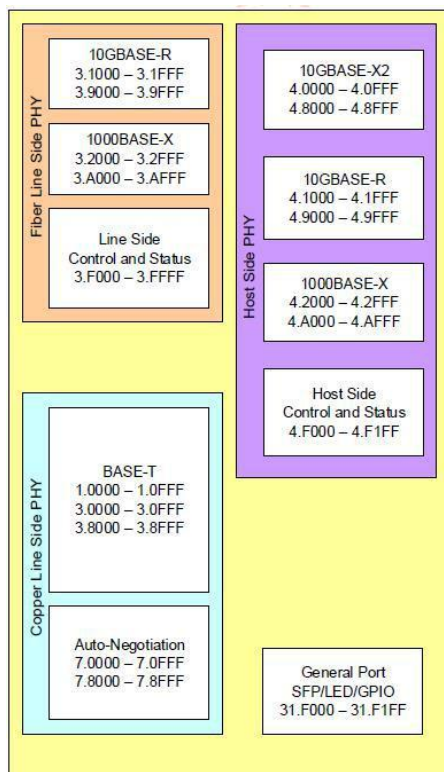
Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V _{CC}	0		3.6	V
Storage Temperature	T _s	-40		+85	°C

13. EEPROM Information

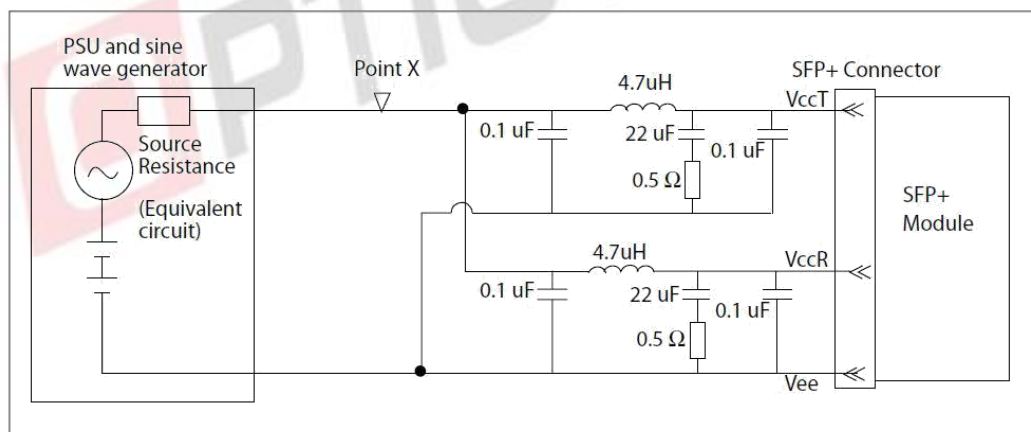
2 wire address 1010000x (A0h)

Serial ID Defined by SFP MSA (96 bytes)
Vendor Specific (32 bytes)
Reserved, SFF-8079 (128 bytes)

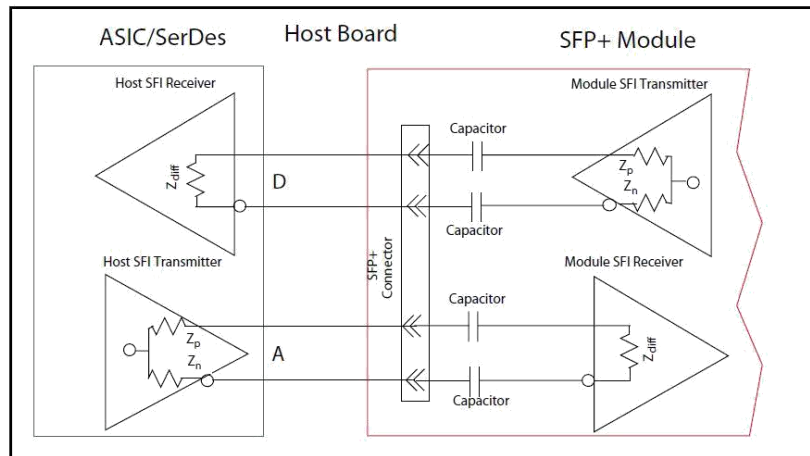
14. Physical Layer IC Register



15. Recommended Host Board Power Supply Circuit

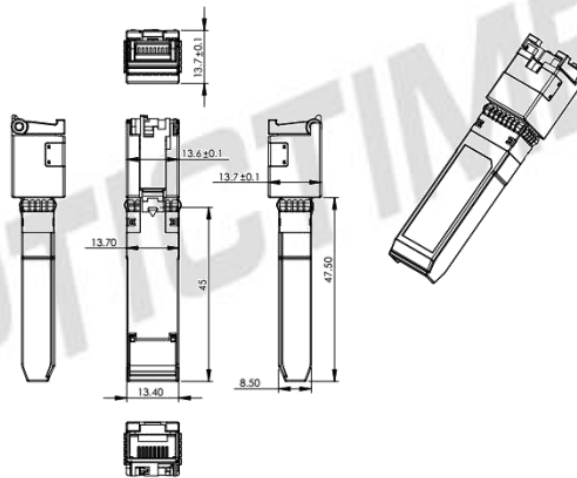


16. Recommended Interface Circuit



17. Mechanical Specifications

The mechanical specifications outlined in the SFP MSA. The front portion of the SFP (part extending beyond the face plate of the host) is larger to accommodate the RJ-45 connector.



18. Ordering Information

Part number	Speed mode	MAC interface	TX Disable function	Link Indicator on RX_LOS Pin	Temp
SFP-10G-T	10Gbps	XFI/5GBASE-R/2500BASE-X/SGMII	YES	YES	0~70°C