ES-T5-R

10GBASE-T SFP+ Copper Transceiver

PRODUCT FEATURES

- Support 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T
- 10 Gigabit Ethernet over Cat 6a cable
- Hot-pluggable SFP footprint
- RJ45 connector
- Compliant with SFP MSA
- Single +3.3V power supply
- RoHS compliant and lead-free
- Operating case temperature:

  Commercial：0°C to +70°C

APPLICATIONS

- 10GBASE-T
- 5GBASE-T
- 2.5GBASE-T
- 1000BASE-T

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DESCRIPTIONS

SFP+-10GBASE-T Copper Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA). They are compatible with the 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T standards as specified in IEEE Std 802.3. SFP+-10GBASE-T uses the SFP's RX_LOS pin for link indication. If pull up SFP's TX_DISABLE pin, PHY IC be reset.

Ordering Information

PN	Host interface	Port type	Line rate	Temperature
ES-T5-R	XFI	10G	10G(5G/2.5G/1000M with flow control)	Commercial

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

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Maximum Supply Voltage	Vcc	-0.5		4.0	V
Storage Temperature	TS	-40		+85	°C

Recommended Operating Conditions

Parameter	Symbol	Min	Typ.	Max	Unit
Supply Voltage	Vcc	3.14	3.3	3.46	V
Storage Temperature	TS	-40		+85	°C
Case Operating Temperature	Commercial	0		+70	°C

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
+3.3V Electrical Power Interface						
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			900	mA	1
Low-Speed Signals, Electronic Characteristics						
SFP Output LOW	Vol	0		0.5	V	2
SFP Output HIGH	Voh	Vcc-0.5		Vcc+0.3	V	2
SFP Input LOW	Vil	0		0.4	V	3
SFP Input HIGH	Vih	2.8		Vcc+0.3	V	3
High-Speed Electrical Interface, Transmission Line-SFP						
Tx Output Impedance	Zout, TX		100		Ohm	4
Rx Input Impedance	Zin, RX		100		Ohm	4
High-Speed Electrical Interface, Host-SFP						
Differential CML Inputs	Vin	250		1200	mV	5
Differential CML Outputs	Vout	350	100	800	mV	5
Rise/Fall Time	Tr/Tf		175		psec	6
Tx Input Impedance	Zin		100		Ohm	7
Rx Output Impedance	Zout		100		Ohm	7

Notes:

1) 3.0W maximum power consumption over full range of voltage and temperature. Power consumption and surge current are higher than the specified values in the SFP MSA.

2) 4.7k to 10k pull-up to host_Vcc, measured at host side of connector.

3) 4.7k to 10k pull-up to Vcc, measured at SFP side of connector.

4) Differential.

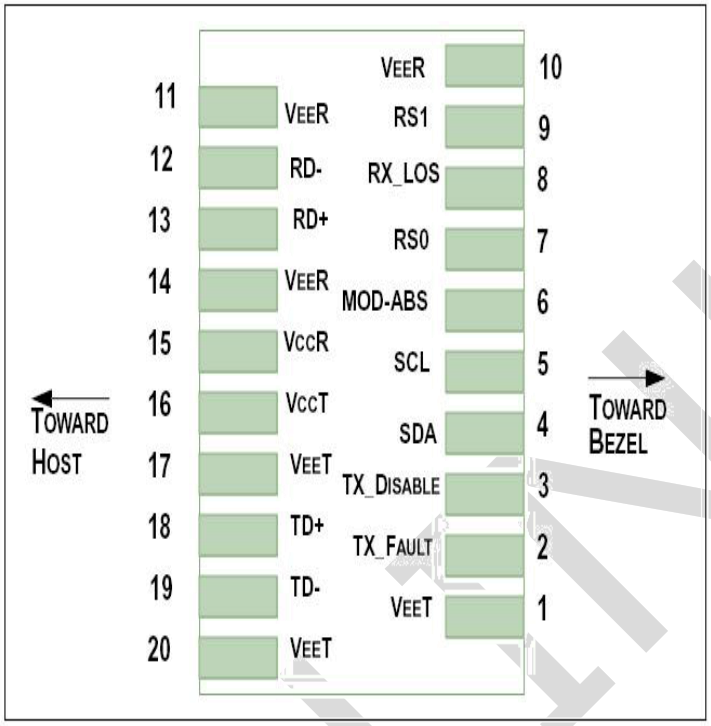
5) AC coupled.

6) 20%-80%.

7) Differential ended.

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Pin Diagram



Pin Definitions

Pin	Symbol	Name/Description	Ref.
1	Veet	Transmitter Ground (Common with Receiver Ground)	1
2	TX_Fault	Transmitter Fault. Not supported.	
3	TX_Disable	Transmitter Disable.	2
4	SDA	2-wire Serial Interface Data Line	3
5	SCL	2-wire Serial Interface Clock Line	3
6	MOD_ABS	Module Absent. Grounded within the module	3
7	RS0	No connection required	
8	RX_LOS	Loss of Signal indication.	4
9	RS1	No connection required	
10	Veer	Receiver Ground (Common with Transmitter Ground)	1
11	Veer	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	Veer	Receiver Ground (Common with Transmitter Ground)	1
15	Vccr	Receiver Power Supply	

16	Vcct	Transmitter Power Supply	
17	Veer	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	Veer	Transmitter Ground (Common with Receiver Ground)	1

Notes:

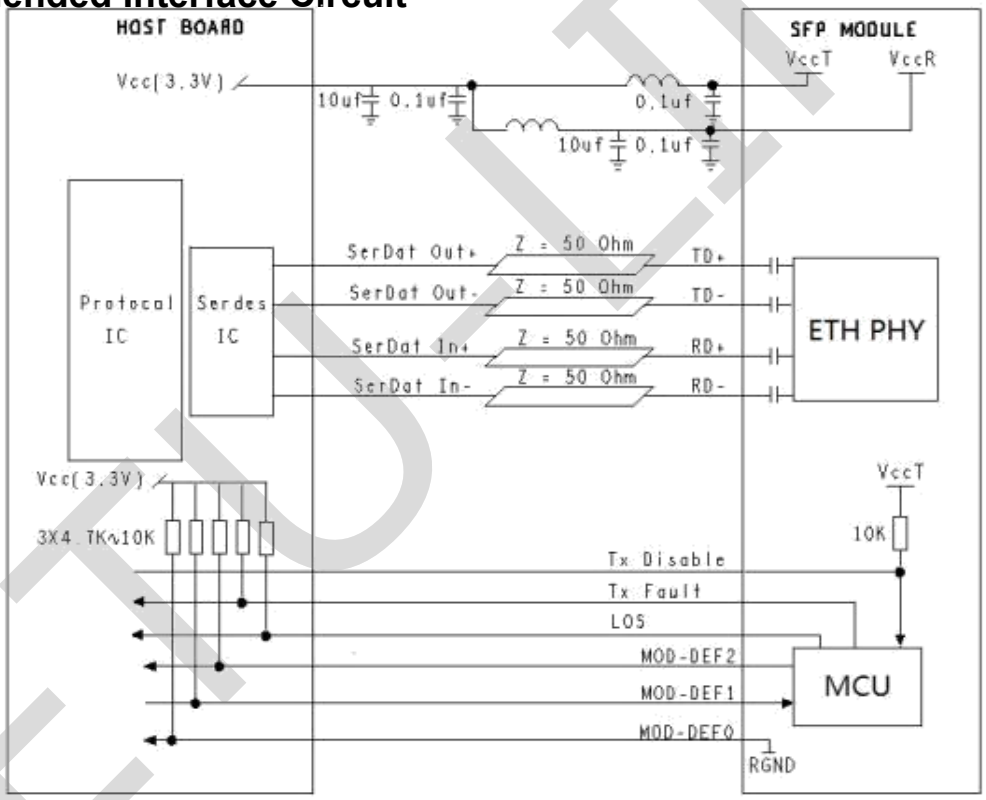
1) Circuit ground is internally isolated from chassis ground.

2) PHY disabled on TX_Disable > 2.0V or open, enabled on TX_Disable < 0.8V.

3) Should be pulled up with a 4.7k to 10k resister to host_Vcc on the host board. MOD_ABS pulls line low to indicate module is plugged in.

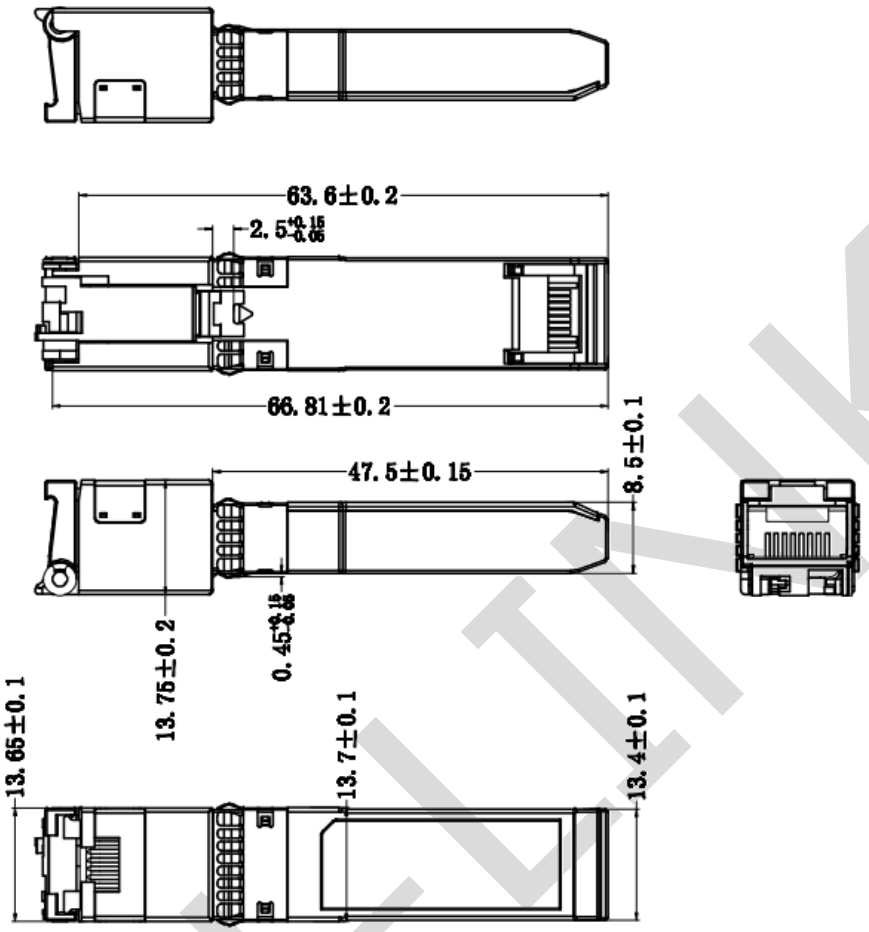
4) LVTTL output, should be pulled up with a 4.7k to 10k resister to host_Vcc on the host board. Low indicates linked.

Recommended Interface Circuit



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Mechanical Diagram



Revision History

Version No.	Date	Description
1.0	Oct,15, 2018	Preliminary datasheet
2.0	Aug 11,2024	Product upgrades

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