

ES-T5-R-1

10GBASE-T SFP+ Copper Transceiver

PRODUCT FEATURES

- Support 10GBASE-T operation in host system and auto-negotiation to lower speed
- Support RX_LOS as link indication
- 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

DESCRIPTIONS

ES-T5-R-1 10GBASE-T Copper Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA). They are compliant with the 10GBASE-T, 5GBASE-T, 2.5GBASE-T and 1000BASE-T.

Ordering Information

PN	Host interface	Port type	Line rate	Temperature
ES-T5-R-1	XFI	10G	10G(5G/2.5G/1000M/100M/10M with flow control)	Commercial
ES-T5-R-2	XFI	10G	10G(5G/2.5G/1000M/100M/10M with flow control)	Industrial
ES-T5-R-3	XFI or SGMII	10G or 1G	10G/2.5G(in10G port), 1000M/100M/10M(in 1G port)	Commercial
ES-T5-R-4	XFI or SGMII	10G or 1G	10G/2.5G(in10G port), 1000M/100M/10M(in 1G port)	Industrial
ES-T5-R-5	USXGMII	10G with USXGMII	10G/5G/2.5G/1000M/100M/10M	Commercial
ES-T5-R-6	USXGMII	10G with USXGMII	10G/5G/2.5G/1000M/100M/10M	Industrial

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
	Industrial	-40		+85	°C

Electrical Characteristics

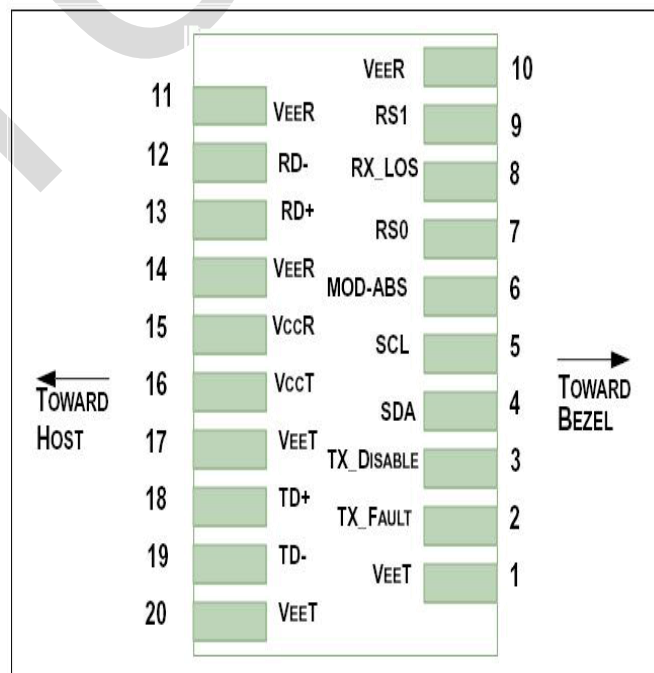
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
+3.3V Electrical Power Interface						
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			900	mA	1
Low-Speed Signals, Electronic Characteristics						
SFP Output LOW	Vol	0		0.5	V	2
SFP Output HIGH	Voh	Vcc-0.5		Vcc+0.3	V	2
SFP Input LOW	Vil	0		0.4	V	3

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.

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 resistor to host_Vcc on the host board. MOD_ABS pulls line low to indicate module is plugged in.
- 4) LVTTTL output, should be pulled up with a 4.7k to 10k resistor to host_Vcc on the host board. Low indicates linked.

Host Board

Vcc(+3.3V) 22uF 0.1uF

Vcc(+3.3V) 22uF 0.1uF

4.7 K Ω

Ser Data In

Ser Data In

Ser Data Out+

Ser Data Out

Vcc(+3.3V)

4.7 K Ω

Vcc(+3.3V)

3x 4.7~10K Ω

Transceiver Module

VeeT

VccT

VccR

VeeR

RX_LOS

RD-

RD+

TD+

TD-

TX_DIS

TX_Fault

SDA

SCL

MCD_ABS

Limiting Amplifier

Laser Driver

MCU

100 Ω

VccT

4.7~10K Ω

Termination: Z=50 Ω

[illegible]

Revision History

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

Company: ETU-Link Technology Co., LTD

Production base: Right side of 3rd floor, No. 102 building, Longguan expressway, Dalang street,
Longhua District, Shenzhen city, Guangdong Province, China 518109

R&D base: Floor 4, Building 4, Nanshan Yungu Phase LI, Taoyuan Community, Xili Street, Nanshan District,
Shenzhen

Tel: +86-755 2328 4603

Addresses and phone number also have been listed at www.etulinktechnology.com.

Please e-mail us at sales@etulinktechnology.com or call us for assistance.