

T-1G-RJ45

1000BASE-T Copper SFP Transceiver

Features

Support 1000BASE-T Operation in Host Systems
For 100m Reach over Cat 5 UTP Cable
Hot-Pluggable SFP Footprint
Fully Metallic Enclosure for Low EMI
Low Power Dissipation (1.05W Typical)
Compact RJ-45 Connector Assembly
Access to Physical Layer IC via 2-Wire Serial Bus
Detailed Product Information in EEPROM
Compliant with SFP MSA
Compliant with IEEE Std 802.3-2002
Operating case temperature range of
0°C to +70°C (Standard)



Applications

- ◆ LAN 1000Base-T
- ◆ Gigabit Ethernet over Cat 5 Cable
- ◆ Switch to Switch Interface
- ◆ Router/Server interface

Ordering Information

Part No.	Data Rate	Fiber	Distance	Interface	Temperature	DDMI
T-1G-RJ45	1000Mbps		100m	RJ45	Standard	

Product Description

T-TECH's T-1G-RJ45 1000BASE-T Copper Small Form Pluggable (SFP) modules are based on the SFP Multi Source Agreement (MSA). It is compliant with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE STD 802.3 and 802.3ab.

Regulatory Compliance

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C

Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
	Industrial		-40		+85	°C
Supply Voltage		Vcc	3.14	3.3	3.46	V

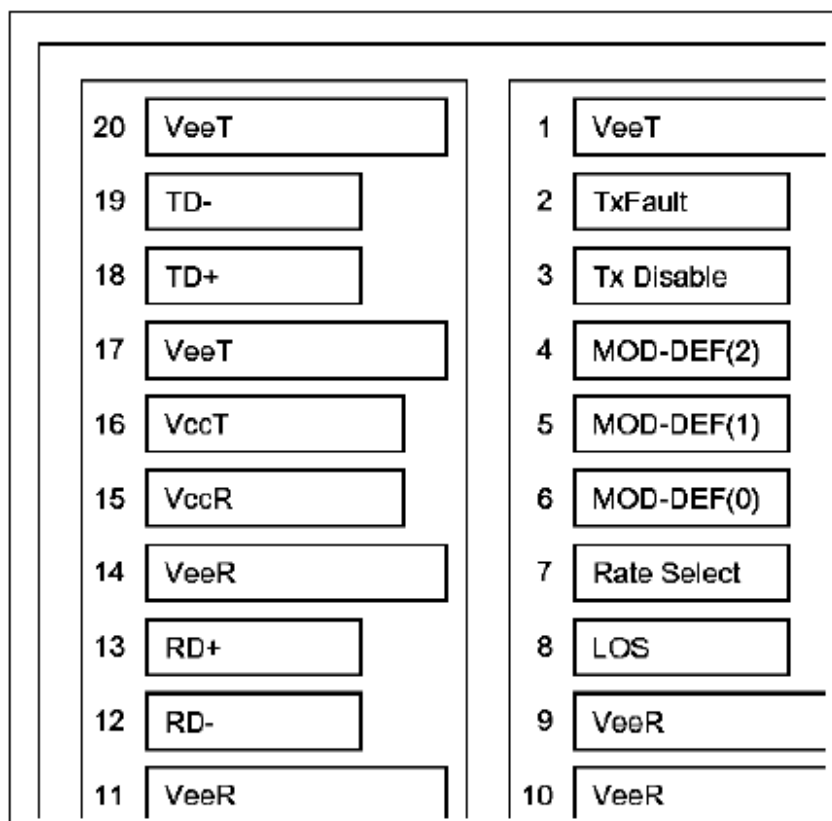
Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
+3.3 Volt Electrical Power Interface						
Supply Current	Icc		300	350	mA	
Input Voltage	Vcc	3.13	3.3	3.47	V	
Surge Current	I _{surge}			30	mA	
Low-Speed Signals, Electronic Characteristics						
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						
Line Frequency	fL		125		MHz	5-level encoding, per IEEE 802.3
Tx Output impedance	Z _{out} , TX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
Rx Input Impedance	Z _{in} , RX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
High-Speed Electrical Interface, Host-SFP						
Single ended data input swing	V _{in}	250		1200	mV	Single ended
Single ended data output swing	V _{out}	350		800	mV	Single ended
Rise/Fall Time	T _r , T _f		175		psec	20%-80%
Tx Input Impedance	Z _{in}		50		Ohm	Single ended
Rx Output Impedance	Z _{out}		50		Ohm	Single ended

General specifications

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Data rate			1000		Mbps	
Distance				100	m	Category 5 UTP. BER<10 ⁻¹²

SFP Transceiver Electrical Pad Layout



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Not used
3	TX Disable	Transmitter Disable	3	1
4	MOD_DEF(2)	Module Definition 2	3	2
5	MOD_DEF(1)	Module Definition 1	3	2
6	MOD_DEF(0)	Module Definition 0	3	2
7	Rate Select	Not Connect	3	
8	LOS	Loss of Signal	3	Not used
9	VeeR	Receiver ground	1	
10	VeeR	Receiver ground	1	
11	VeeR	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
14	VeeR	Receiver ground	1	
15	VccR	Receiver Power Supply	2	
16	VccT	Transmitter Power Supply	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	

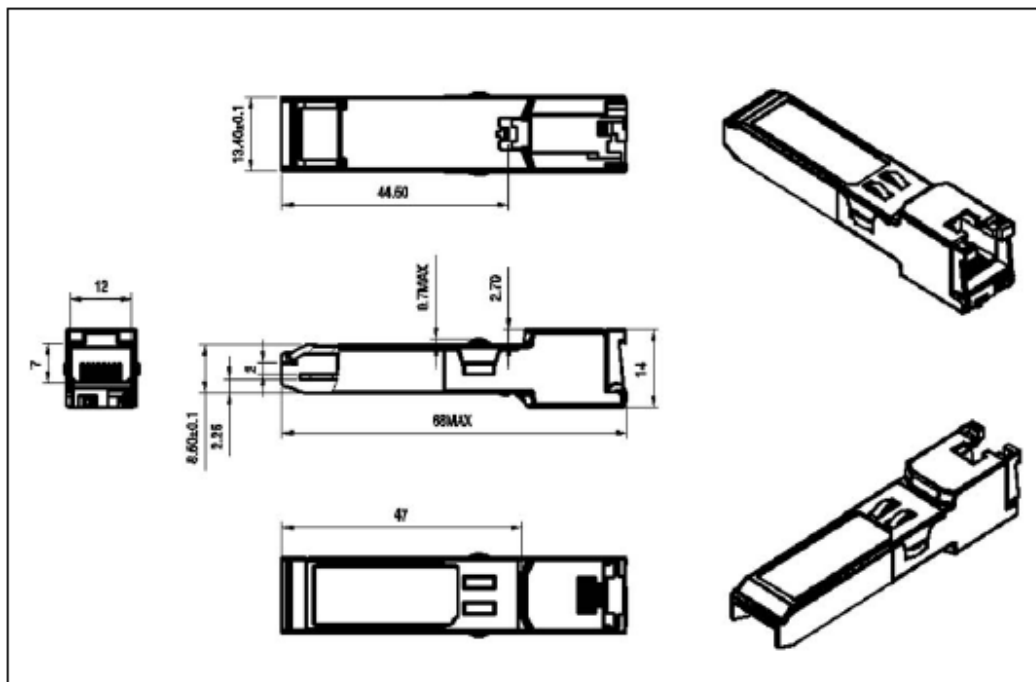
Notes:

- PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V, used to reset the module.
- Should be pulled up with 4.7k ~ 10k Ohm on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

Serial Communication Protocol

T-TECH Copper SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFP use a 128 byte EEPROM with an address of A0H. The 1000BASE-T physical layer IC can also be accessed via the 2-wire serial bus at address ACH.

Mechanical Dimensions



Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>500 V) Isolation with the case
Electromagnetic Interference (EMI)	FCC Part 15 Class B	Compatible with standards
Component Recognition	UL and CUL	UL file E317337
Green Products	2002/95/EC 2005/618/EC	RoHS6

References

1. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.

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