T-1G-RJ45A

10/100/1000BASE-T Copper SFP Transceiver

Features

Support 10/100/1000BASE-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-A	10/100/1000Mbps		100m	RJ45	Standard	

Product Description

T-TECH`s T-1G-RJ45-A 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

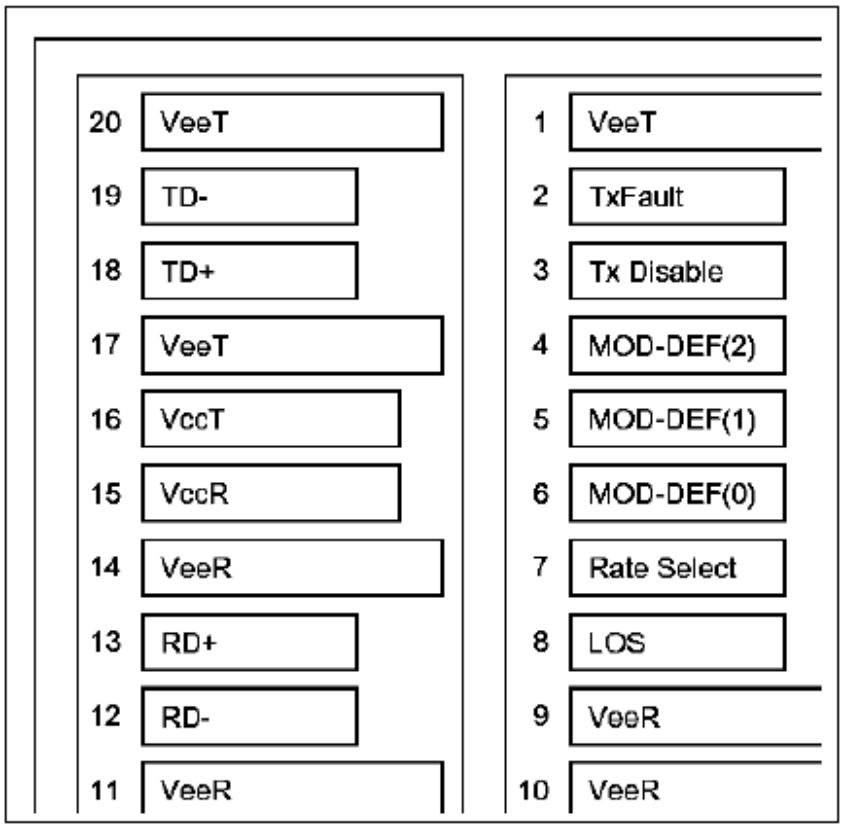
Electrical Characteristics

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	Isurge			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	Zout, TX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
Rx Input Impedance	Zin, RX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
High-Speed Electrical Interface, Host-SFP						
Single ended data input swing	Vin	250		1200	mV	Single ended
Single ended data output swing	Vout	350		800	mV	Single ended
Rise/Fall Time	Tr, Tf		175		psec	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		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:

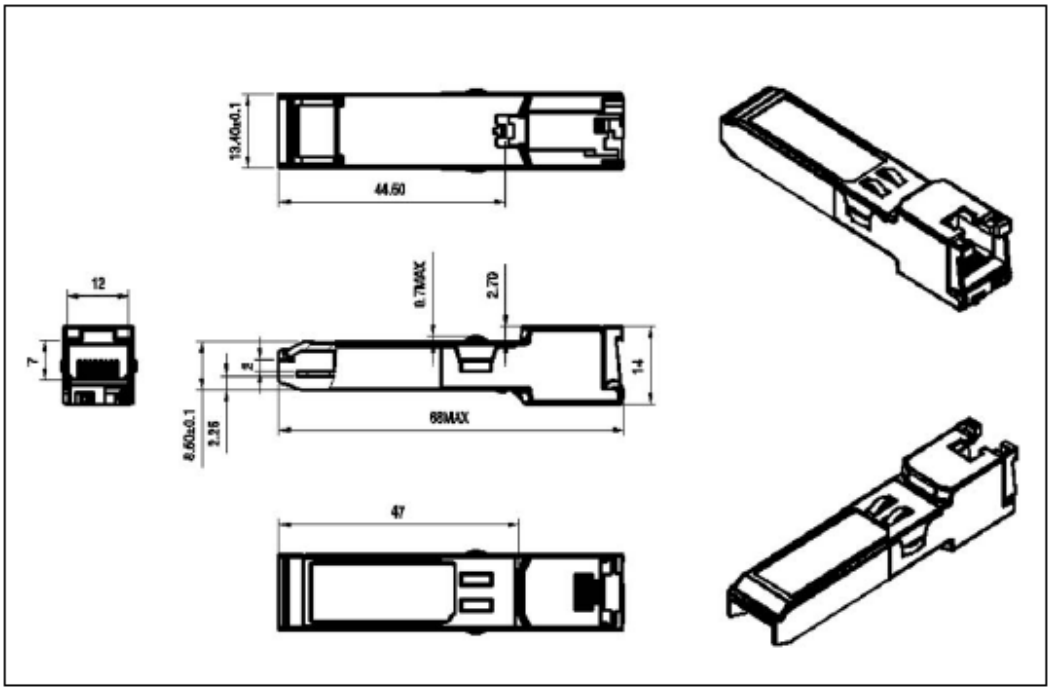
1. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V,used to reset the module.

2. 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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