

ProLabs SFP-1G-T

SFP-1G-T Copper Transceiver

Key Features

- Up to 1.25 GBd bi-directional data links
- Compliant with IEEE 802.3z, IEEE 802.3u, IEEE 802.3ab
- Compliant with SFP MSA
- Hot-pluggable SFP footprint
- Support 1000BASE-T full duplex default operating mode
- Support 10/100/1000BASE-T operation in host systems with SGMII interface
- RJ-45 connector
- Auto-sense MDI/MDIX
- Single power supply 3.3V
- Fully RoHS Compliance
- Operating temperature range: 0°C to 70°C.



Applications

- 1.25 GBd Gigabit Ethernet



Ordering Information

Part Number	Description
SFP-1G-T	1000BASE-T SFP Copper RJ-45 Connector 100m Auto Negotiation Version.

Introduction

PROLABS's SFP-1G-T Copper SFP transceivers are based on Gigabit Ethernet IEEE 802.3 standard and 1000BASE-T standard and provide a reliable interface for Gigabit Ethernet application. The 1000BASE-T physical layer PHY can be accessed via I2C, allowing access to all PHY setting and features. In addition, they comply with the Small Form Factor Pluggable Multi Sourcing Agreement (MSA).

Compatible Ordering Information

OEM Manufacturer	Prolabs Ordering SKU	Product Description
ADVA	0061705890-C	1000BASE-T SFP, RJ45 Connector, 100m
Alcatel	1AB359780002-C	1000BASE-T SFP, RJ45 Connector, 100m
Alcatel	3FE28784AA-C	1000BASE-T SFP, RJ45 Connector, 100m
Alcatel	3HE00062AA-C	1000BASE-T SFP, RJ45 Connector, 100m
Alcatel	SFP-GIG-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Allied	AT-SPTX-C	1000BASE-T SFP, RJ45 Connector, 100m
Arista	SFP-1G-T-ARISTA-C	1000BASE-T SFP, RJ45 Connector, 100m
Avaya	AA1419043-C	1000BASE-T SFP, RJ45 Connector, 100m
Blackbox	LBG200C-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Blackbox	LFP415-C	1000BASE-T SFP, RJ45 Connector, 100m
Blackbox	LFP416-C	1000BASE-T SFP, RJ45 Connector, 100m
Blackbox	LFP417-C	1000BASE-T SFP, RJ45 Connector, 100m
Brocade	E1MG-TX-C	1000BASE-T SFP, RJ45 Connector, 100m
Brocade	XBR-000190-C	1000BASE-T SFP, RJ45 Connector, 100m
BTN/IBM	00FE333-C	1000BASE-T SFP, RJ45 Connector, 100m
BTN/IBM	BN-CKM-S-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Calix	100-01661-C	1000BASE-T SFP, RJ45 Connector, 100m
Checkpoint	CPAC-TR-1T-C	1000BASE-T SFP, RJ45 Connector, 100m
Ciena	XCVR-000CRJ-C	1000BASE-T SFP, RJ45 Connector, 100m
Cisco	DS-SFP-GE-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Cisco	GLC-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Cisco	SFP-GE-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Dell Force10	GP-SFP2-1T-C	1000BASE-T SFP, RJ45 Connector, 100m
D-Link	DEM-712-C	1000BASE-T SFP, RJ45 Connector, 100m
Enterasys	MGBIC-02-C	1000BASE-T SFP, RJ45 Connector, 100m
Extreme	10065-C	1000BASE-T SFP, RJ45 Connector, 100m
F5 Networks	F5-UPG-SFPC-R-C	1000BASE-T SFP, RJ45 Connector, 100m
Fortinet	FG-TRAN-GC-C	1000BASE-T SFP, RJ45 Connector, 100m
Generic	1000BASE-T-SFP-C	1000BASE-T SFP, RJ45 Connector, 100m
H3C Huawei	SFP-GE-T-H3C-C	1000BASE-T SFP, RJ45 Connector, 100m
HP 3Com	3CSFP93-C	1000BASE-T SFP, RJ45 Connector, 100m
HP Comware	JC009A-C	1000BASE-T SFP, RJ45 Connector, 100m
HP Comware	JD089B-C	1000BASE-T SFP, RJ45 Connector, 100m
HP ProCurve	J8177C-C	1000BASE-T SFP, RJ45 Connector, 100m
HP Server	453154-B21-C	1000BASE-T SFP, RJ45 Connector, 100m
Huawei	SFP-1000BASE-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Huawei	SFP-GE-T-HW-C	1000BASE-T SFP, RJ45 Connector, 100m
Juniper	EX-SFP-1GE-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Juniper	SFP-1GE-FE-E-T-C	1000BASE-T SFP, RJ45 Connector, 100m
Linksys	MGBT1-C	1000BASE-T SFP, RJ45 Connector, 100m
MRV	SFP-GA-R-C	1000BASE-T SFP, RJ45 Connector, 100m
MRV	SFP-GC-R-C	1000BASE-T SFP, RJ45 Connector, 100m
Netgear	AGM734-C	1000BASE-T SFP, RJ45 Connector, 100m
Netscout	321-0434-C	1000BASE-T SFP, RJ45 Connector, 100m
Packetfront	SFP-1000BASE-T-PAC-C	1000BASE-T SFP, RJ45 Connector, 100m
Palo Alto	PAN-SFP-CG-C	1000BASE-T SFP, RJ45 Connector, 100m
Planet	MGB-GT-C	1000BASE-T SFP, RJ45 Connector, 100m
Redback	SFP-1GE-T-RED-C	1000BASE-T SFP, RJ45 Connector, 100m
Riverbed	SFP-005-TX-C	1000BASE-T SFP, RJ45 Connector, 100m
Ruijie	Mini-GBIC-GT-C	1000BASE-T SFP, RJ45 Connector, 100m
Telco	BTI-MGBIC-M-TX-C	1000BASE-T SFP, RJ45 Connector, 100m
ZTE	SFP-GE-RJ45-C	1000BASE-T SFP, RJ45 Connector, 100m
ZyXEL	SFP-1000T-C	1000BASE-T SFP, RJ45 Connector, 100m

Specification

General Specifications						
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate ¹	DR	10	-	1000	Mb/sec	IEEE 802.3.
Cable Length	CL	-	-	100	M	Category 5 UTP.
Bit Error Rate	BER	-	-	10 ⁻¹²	-	-
Operating Temperature	T _{OP}	0	-	70	°C	Case temperature.
Storage Temperature	T _{STO}	-40	-	85	°C	Ambient temperature.
Supply Current	I _S	-	320	375	mA	For electrical power interface.
Input Voltage	V _{CC}	3.13	3.3	3.47	V	Referenced to GND. For electrical power interface.
Maximum Voltage	V _{MAX}	-	-	4	V	For electrical power interface.
Surge Current	I _{surge}	-	-	30	mA	Hot Plug above steady state current. For electrical power interface.

Note 1: 10/100/1000M operation requires the host system to have an SGMII interface with no clock. With a SERDES interface, this transceiver will operate at 1000M only.

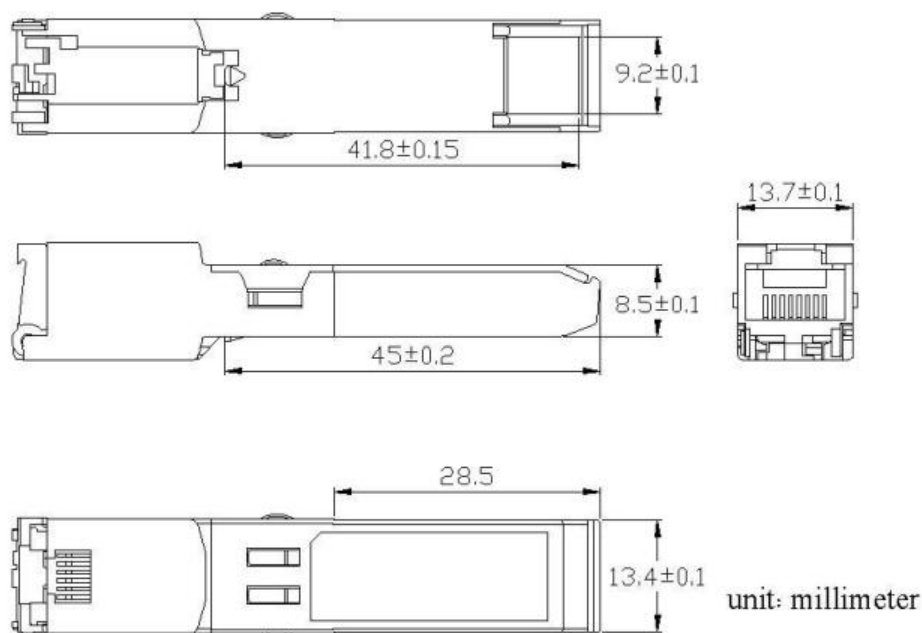
High Speed Electrical Interface Host-SFP						
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential Input Voltage	VINDIFF	250	-	1200	mV	Differential peak-peak
Differential Output Voltage	VOUTDIFF	350	-	800	mV	Differential peak-peak
Rise/Fall Time (20% - 80%)	T _{R-F}	-	175	-	Ps	-
Tx Input impedance	Z _{IN}	-	50	-	Ω	Single ended
Rx Output impedance	Z _{OUT}	-	50	-	Ω	Single ended

High Speed Electrical Interface Transmission Line-SFP						
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Line Frequency	F _L	-	125	-	MHz	5-level encoding
Tx Output Impedance - Differential	Z _{OUT T}	-	100	-	Ω	Note 1
Rx Input Impedance - Differential	Z _{IN RX}	-	100	-	Ω	Note 1

Note 1: For all frequencies between 1MHz and 125MHz.

Low Speed Electrical Signal						
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
SFP Output Low	V _{OL}	0	-	0.5	V	External 4.7-10k ohm pull-up resistor required
SFP Output High	V _{OH}	Host_V _{CC} - 0.5	-	Host_V _{CC} + 0.3	V	External 4.7-10k ohm pull-up resistor required
SFP Input Low	V _{IL}	0	-	0.8	V	External 4.7-10k ohm pull-up resistor required
SFP Input High	V _{IH}	2	-	V _{CC} + 0.3	V	External 4.7-10k ohm pull-up resistor required

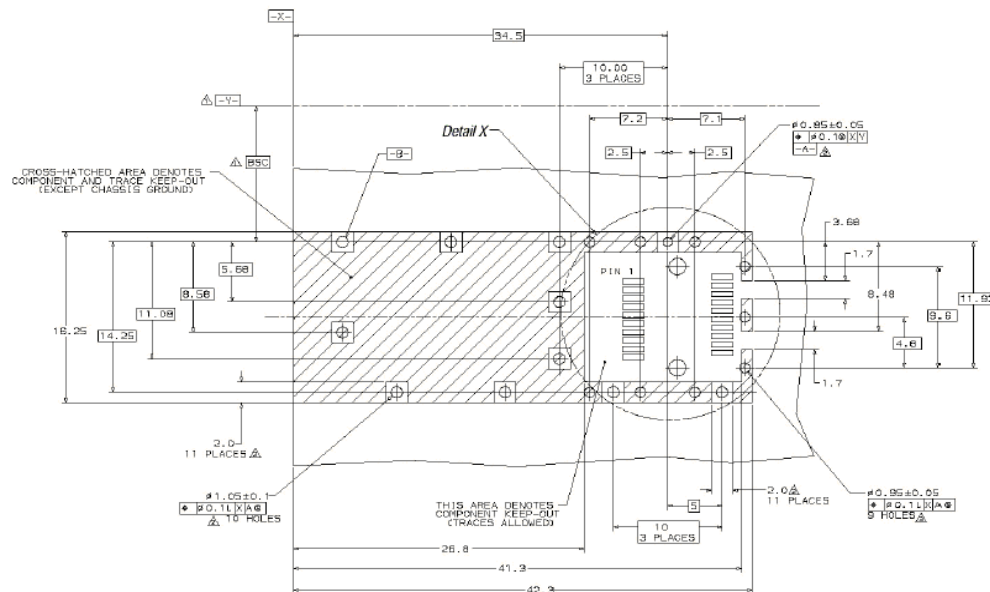
Dimensions



ALL DIMENSIONS ARE ± 0.2 mm UNLESS OTHERWISE SPECIFIED

UNIT: mm

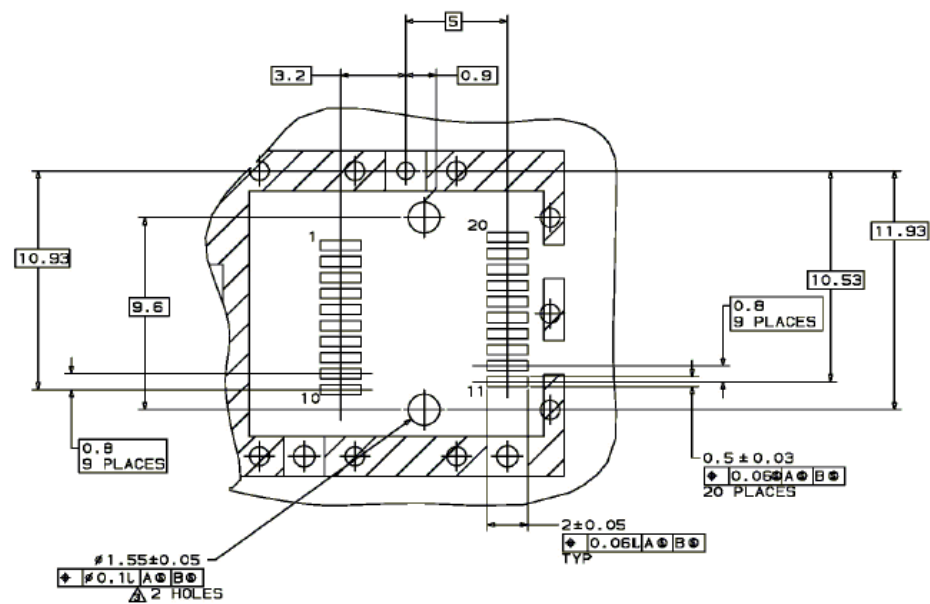
PCB Layout Recommendations



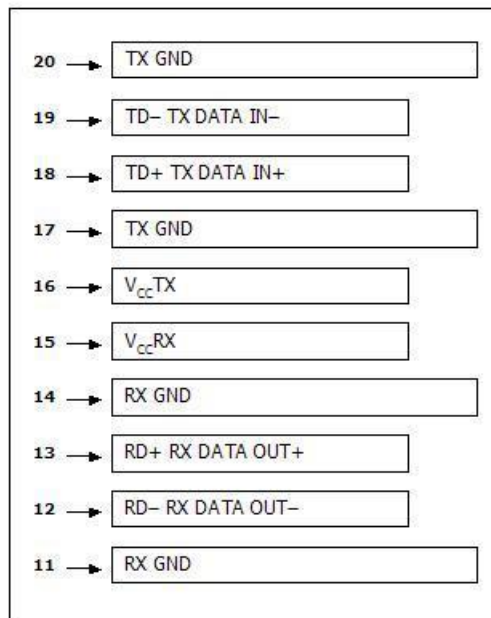
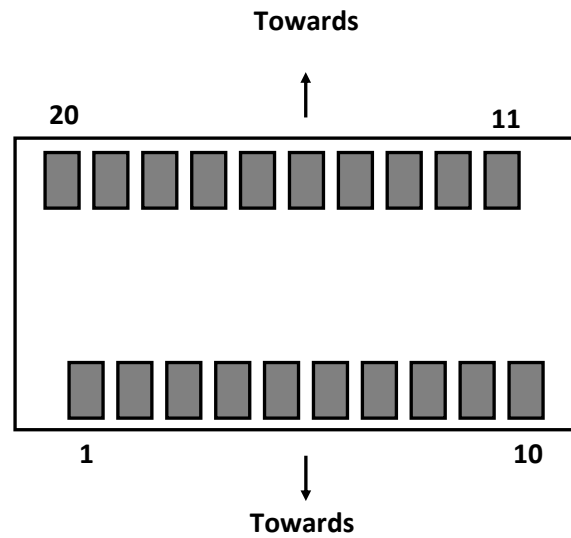
Datum and Basic Dimension Established by Customer

 Rads and Vias are Chassis Ground, 11 Places

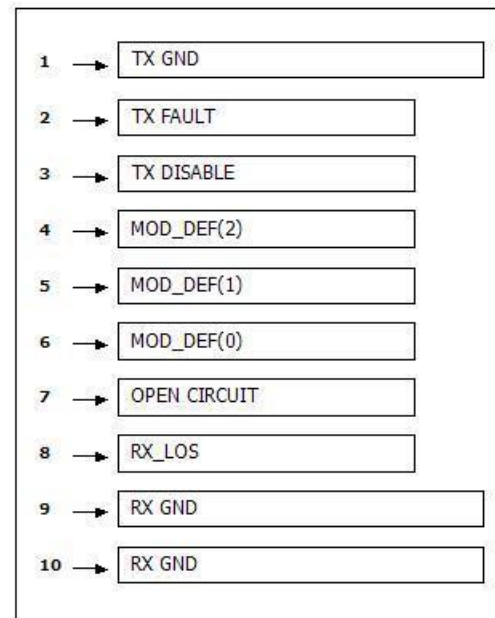
△ Through Holes are Unplated



Electrical Pad Layout



Top of Board



Bottom of Board

Pin Assignments

Pin Assignments			
Pin #	Symbol	Description	Remarks
1	V _{EET}	Transmitter ground (common with receiver ground)	Circuit ground is connected to chassis ground
2	T _{FAULT}	Transmitter Fault. Not supported	-
3	T _{DIS}	Transmitter Disable. PHY disabled on high or open	Disabled: T _{DIS} >2V or open Enabled: T _{DIS} <0.8V
4	MOD_DEF (2)	Module Definition 2. Data line for serial ID	Should Be pulled up with 4.7k – 10k ohm on host board to a voltage between 2V and 3.6V
5	MOD_DEF (1)	Module Definition 1. Clock line for serial ID	
6	MOD_DEF (0)	Module Definition 0. Grounded within the module	
7	Rate Select	No connection required	-
8	LOS	Loss of Signal	Not supported on GLC-T-CA
9	V _{EER}	Receiver ground (common with transmitter ground)	Circuit ground is connected to chassis ground
10	V _{EER}	Receiver ground (common with transmitter ground)	
11	V _{EER}	Receiver ground (common with transmitter ground)	
12	RD–	Receiver Inverted DATA out. AC coupled	-
13	RD+	Receiver Non-inverted DATA out. AC coupled	-
14	V _{EER}	Receiver ground (common with transmitter ground)	Circuit ground is connected to chassis ground
15	V _{CCR}	Receiver power supply	-
16	V _{CCT}	Transmitter power supply	-
17	V _{EET}	Transmitter ground (common with receiver ground)	Circuit ground is connected to chassis ground
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	-
19	TD–	Transmitter Inverted DATA in. AC coupled	-
20	V _{EET}	Transmitter ground (common with receiver ground)	Circuit ground is connected to chassis ground

References

1. IEEE standard 802.3. IEEE Standard Department, 2002.
2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.
3. Marvell Corporation – Alaska Ultra 88E1111 Integrated 10/100/1000 Gigabit Ethernet Transceiver.