Description

The PTC11XX-01G modular Jack has been specifically designed for implementation of fast Ethernet NIC Application .
These modular consist of the isolation transformer. Common mode choke, termination resistors and high voltage capacitor termination to the shield.
With high voltage isolation, optimized rise time, wideband width and stable inductance, the transformer integrated the module provide excellent performance as an analog interface. Common mode choke have been designed to significantly reduce common mode choke level which may contribute EMI emission.
PTC11XX-01G modular jack provide the system designer the opportunity of reducing pcb space.

Feature

♦ For RoHS part add postfix G

♦ Designed for network interface card application.

♦ Designed to meet IEEE802.3u requirement.

♦ Designed for RoHS process.

♦ Available in all turn ratios used by LAN IC manufactures.

♦ Primary center taps available for additional EMI reduction.

♦ Simplest magnetic component to place and route on PCB.

♦ Contains termination resistors magnetic and connector.

♦ Conserves PCB space.

Specifications

Parameter	Condition	Min.	Max.	unit
Inductance	@100KHz,100mV *note1	350		μH
Insertion loss	@1-100MHz		-1.0	dB
Return loss	@1-30MHz	-16		dB
	@30-60MHz	*note2		dB
	@60-80MHz	-10		dB
Cross talk	@1-60MHz	-40		dB
	@60-100MHz	-38		dB
CMRR(TX/RX)	@1-60MHz	-45/-40		dB
	@60-100MHz	-40/-35		dB
Voltage isolation		1500		vrms
Operating temp.		0	70	^{0}C

Turn Ratio

Part No.:	TX	RX
PTC1111-01G	1CT : 1CT	1CT : 1CT
PTC1141-01G	1.414CT : 1CT	1CT : 1CT
PTC1121-01G	2CT : 1CT	1CT : 1CT
PTC1151-01G	1.25CT : 1CT	1CT : 1CT
PTC1114-01G	1CT : 1.414CT	1CT : 1CT
PTC1115-01G	1CT : 1.25CT	1CT : 1CT
PTC1112-01G	1CT : 2CT	1CT : 1CT
PTC1125-01G	1CT : 2.5CT	1CT : 1CT

Note 1 : measured at 8 mAdc over operating temperature 0-70^{0}C

Note 2: Greater than (16-20 log(f/30 MHz)) dB

Schematic

Test Requirements and Procedures

No	Item	Requirement	Test or Inspection Method
1	Examination of product	Meet requirements of product drawing	Visual, dimensional and functional per applicable inspection plan.
2	Solderability	Max. 5% de-wetting, inspection with 10 times magnification.	Inspect surface of soldering legs visually, after soldering samples mounted on a printed circuit board. Steam:1hr Solderbath: 260^{0}C Duration: 2 ± 0.5 seconds. Ref: Sony Technical Standards SS-00254-4
3	Resistance to soldering heat	No functional damage.	Inspect Jack visually after soldering samples on a printed circuit board. Solderbath: 260^{0}C Duration: 5~6 seconds. Ref: Sony Technical Standards SS-00254-4
4	Contact resistance	contact resistance 10 milliohms max per initial contact resistance (Δ R 30 milliohms max. For Tool-LESS)	Subject mated Plug and Jack to 20mV open circuit at 10 mA maximum. See fig. 3. Ref: IEC 512-2,test 2a.
5	Dielectric withstanding voltage	1500 Vac RMS dielectric withstanding voltage.	Subject adjacent contacts of mated plug and jack to the specified voltage . Ref: IEC 512-2,test 4a. method B.
6	Insulation Resistance	500 Megohms minimum.	Subject adjacent contacts of mated plug and jack to the specified voltage:500Vdc . Ref. IEC 512-2,test 3a. method B.

Test Requirements and Procedures

No	Item	Requirement	Test or inspection Method
7	Printed circuit board retention	Module Jack should not dislodge from p.c.b	Apply load of 20 LBS to modular Jack which is mounted on a printed circuit board of 1.6mm thickness, at a rate of 25mm per minute.
8	Plug retention in Jack	Plug shall not dislodge from Jack and shall maintain electrical continuity.	Apply axial Load of 20 LBS to modular plug which is mated to a modular Jack at a rate of 25mm per minute.
9	Vibration	No physical damage.	Random vibration / Overall : 1.15 g rms Freq. (Hz) : 1 → 4 → 100 → 200 PSD (g^2/Hz) : 0.0001 → 0.01 → 0.01 → 0.001 Test Axis/ Time : Top / 30 mins Bottom / 10 mins X axis : 10 mins Y axis : 10 mins Ref :ISTA PROJECT 2A
10	Durability	Contact resistance ,plug Retention and pcb retention shall meet each specified requirement	Mate and unmate Plug and Jack For 500 cycles total at a maximum rate of 500 cycles/hour. Ref: IEC 512-5,test 9a.
11	Insertion force	Insertion force should Not exceed 5 pounds	Measure force necessary to mate Plug and Jack at a rate of 25mm per minute Ref:IEC512-7,test 13b.
12	Thermal shock	Contact resistance, Insulation resistance shall meet each specified requirement .	Subject mated Plug and Jack to 5 cycles between -40^{0}C and 85^{0}C. The duration at the extreme temperature is by weighing specimen to determine it. Ref:MIL-STD-202 method 107
13	Temperature-humidity exposure	Contact resistance, Insulation resistance shall meet each specified requirement .	Subject mated Plug and Jack adds bias 100 Vdc at 40^{0}C /95%RH. Duration: 96hrs Ref:MIL-STD-202 method 103
14	High temperature exposure	Contact resistance Insulation resistance shall meet each specified requirement	Subject mated Plug and Jack adds bias 25 Vdc at 100^{0}C Duration: 96hrs Ref:MIL-STD-202 method 108

Test Setup : Insertion Loss Measurement

The insertion loss of a device connected into a given Transmission system is defined as the ration of power (before and after insertion) delivered to the output network beyond the point of insertion at a given frequency.

Fiq1 illustrate the test circuit configuration for insertion loss measurement. To perform the insertion loss test ,thru calibration must be done prior the measuring while the network Analyzer being selected in S21 mode.

A matching balun must be used to convert the 50ohms of output impedance of test instrument into the primary input impedance of the device under test.

Without this matching balun, impedance mismatch between the test instrument and the device causes measurement error.
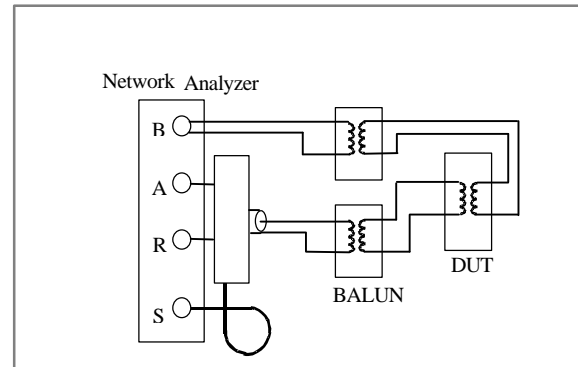
Fig1

Return loss measurement
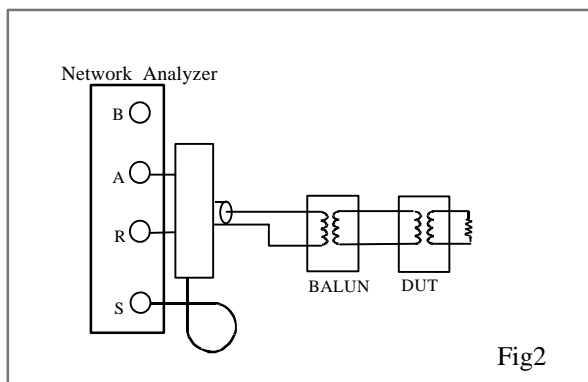
Fig2

Fig2

Return loss measure the amount of energy that is lost due to Reflection.

Reflected energy occur because of impedance mismatching these energy will reduce the overall system efficiency and emanate nuisance noise.

Fig2 illustrate the test configuration for return Loss measurement

To perform the return loss test ,open ,short, load calibration must be done prior to measuring while the network Analyzer being selected in S11 mode.

Two matching baluns with appropriate output impedance must be used to match the impedance of the device under test as shown in the figure 2.

Cross talk measurement

Cross Talk can be measured with setup shown in Fig 3 by applying signal of identical information to the transmitter channel and detecting the coupling signal level at receiver channel.

Through calibration before measurement should be done.

Both of transmitter and receiver channel should be terminated with proper load while measuring.
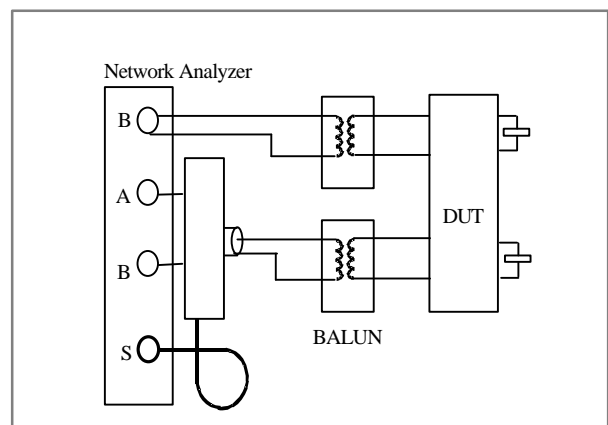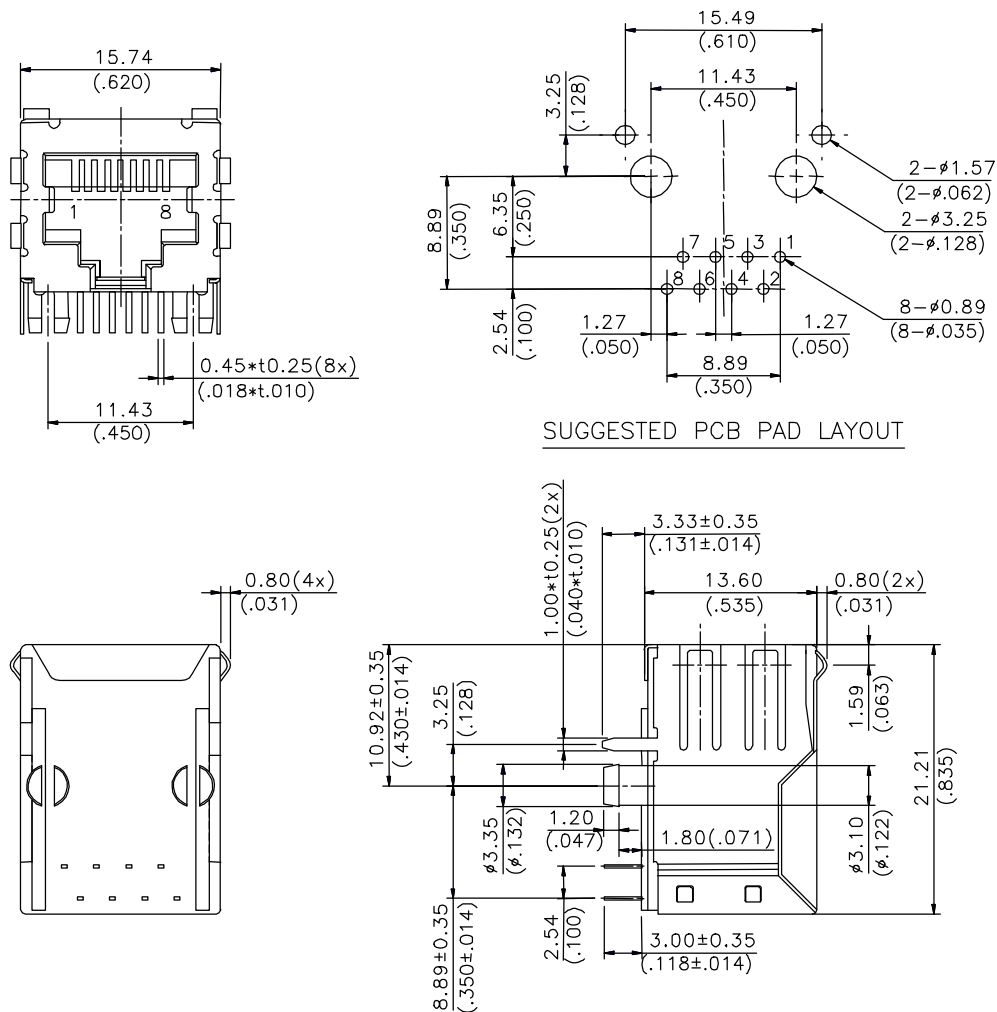

Fig3

Dimension:

SUGGESTED PCB PAD LAYOUT

Unless otherwise specified , all tolerances are mm(inch) ± 0.25(0.01)

♦Shield . . . . 0.25mm Thickness Copper Alloy with Nickel Plated

♦Housing . . . . Standard Material Nylon , Glass Filled Polyester UL94V-0
　　　　　　　　　　　 Standard Color Black

♦Contact Pin . . . . Plastic : Nylon , Glass Filled , UL94V-0 , Standard Color Black

　　　　　　　　　　　 Pin : Phosphor Bronze Wire t0.35*w0.38

　　　　　　　　　　　 Plating : Gold Plating Over Nickel

♦Connect Pin . . . . . . Plastic : Nylon , Glass Filled , UL94V-0 , Standard Color Black

　　　　　　　　　　　 Pin : t0.25*w0.45 Brass Tin plated