

# DESIGNING OF A DEVICE FOR CHECKING THE POLARITY & CONTINUITY OF ANY ELECTRICAL & ELECTRONICS CIRCUIT

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**Abstract** -In case of any electrical & electronics circuit the most important thing that to maintain properly the polarity of supply voltage and continuity of current flow for getting the healthy output without facing any kind of unexpected disturbance (accident). The devices or machines which need to handle after a certain breaking period regularly has to be gone through some part of the checking process against its connection like polarity and continuity test for avoiding the unexpected accidents. In this paper one device has been designed so we can measure the polarity as well as the continuity of any type of electrical and electronics circuit for providing a riskless successful condition of operation.

**Key Words:** Transistor, Diode, Bread Board, LED, Resistor, Capacitor, Buzzer.

## 1.INTRODUCTION

Polarity and Continuity tester is an electrical device. Polarity test used to find out the electrical polarity, that mean the negative and positive side of a given point of an electrical circuit relative another point, a polarity test is done to ensure either that the line and neutral conductors are connected the correct way around it or not.

A continuity tester is used to determine the presence of electrical path that can be established in between two points of an electrical circuit. The circuit under test is completely de-energized before connecting the apparatus.

The tester consists of an indicator in series with a source of electrical power - normally a battery, terminating in two test-leads. If a complete circuit is established between the test-leads, the indicator is activated.

The indicator may be an electric light or a buzzer. This led to the term "buzzing out a circuit" (which means to test for continuity). Audible continuity buzzers or beepers are built into some models of multi-meter.

Polarity and continuity tester have two input sites. One is for polarity and another is for continuity test. The output has been taken by two LED and one buzzer.

In daily life we use TV, light, fan, motors, mobile, as like many more electrical and electronics device. Those are operating by electric input. So we need to check polarity of input side and continuity of the current flow. All of these can be done with the help of the polarity cum continuity tester.

The device has been built with inexpensive components. So it's price is lower than the other available checking device in market.

## 2.CIRCUIT DIAGRAM

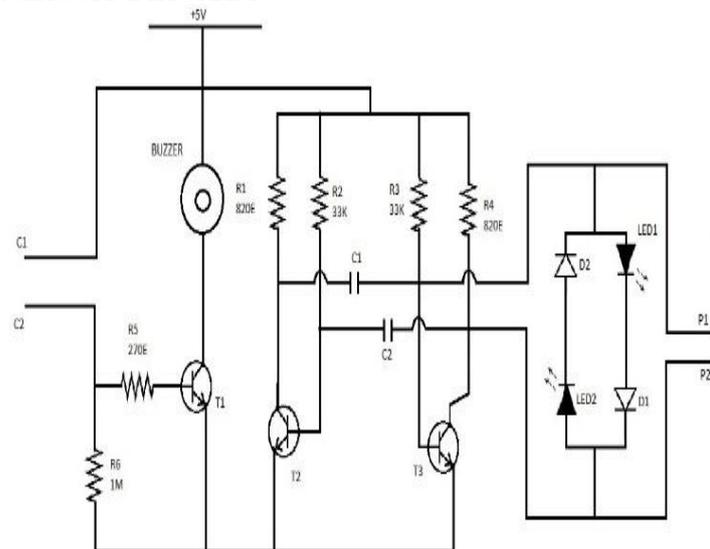


Fig: Circuit diagram of tester

## 3.WORKING PRINCIPAL

In this continuity tester circuit cathode terminal is indicated by glowing of any of the LED. When you first switch on the circuit, both the LED's will glow. Now connect the component across the probe. If the cathode terminal of the component is connected to probe 1, LED1

will glow and if the cathode terminal is connected to probe2, LED2 will glow.

The circuit is made with the help of two transistor configured as a stable multi-vibrator. Outputs of both the transistors are out of phase with each other meaning that if output of one transistor is high then output of another transistor will be low or vice versa. When transistor T1 is "on" and T2 is "off", Led1 will glow similarly when transistor T1 is "off" and transistor T2 is "on" current flow through LED2 and it starts glowing.

When the component under test (diode, LED) is kept between the test probe, it bypasses either of the LED depending upon the polarity. Now the test current will flow through the component instead of the bypassed LED on the circuit. In this circuit we have connected the series combination of LED and Diode at the collector of transistor T1 and T2 to increase the forward voltage drop. This will ensure that the voltage drop across either of the LED is greater than the forward drop of the component being tested.

Test result-When you connect the component.

1. If LED 1 glows it indicates that cathode is connected to probe 1 and anode is connected to the probe 2.
2. If LED 2 glows, it indicates that cathode is connected to probe 2 and anode is connected to the probe 1.
3. If neither of the LED glows, component connected across is short circuited which has made the stable multi-vibrator stop oscillating.
4. If both the LEDs glow, component is open-circuited.

Now for **testing the continuity of the circuit** use the probe C1 and C2 connected to the circuit. When you touch both the probes, buzzer start sounding indicating that circuit is working properly. When both the probes are disconnected, the transistor T3 is closed, there is no base current. At this time, emitter and base of transistor T3 are on the same voltage level. When you go for the continuity test it will open the transistor making the base to go reach a higher voltage level in comparison to emitter and buzzer connected to it starts sounding. With the help of this circuit you can also check different type of cables, PCBs etc.

#### 4.SNAP OF HARDWEAR

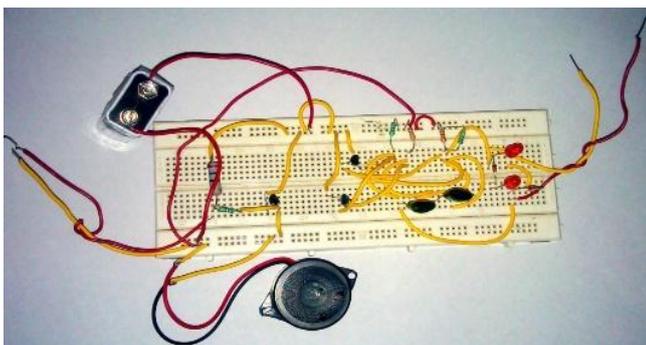


Fig.Picture of tester

#### 5. STEPS BEFORE OPERATION

This can also be used to check the above components are good or bad before mounting them on the PCB. Many a times, it happens that people are unable to identify the polarity of the component which leads due to wrong soldering of components that damages not only the components, it may damage the whole circuit also.

#### 6.APPLICATION

By this device we checked the polarity of any electrical and electronics circuit which is essential for designing any required important system. This tester also helps to check the continuity of the wire of our house wearing system. It can find that the polarity is very important part of a machine for it's parallel operation and this tester is very helpful in that point of view also.

#### 7.CONCLUSION

From this work it can be easily conclude that it is a circuit which can be used for checking both polarity as well as continuity of any electrical and electronics circuit. With the help of this device, we can avoid any unexpected accident. The component of any circuit can also be tested with the help of the device. Before involving the machine (e.g. Transformer etc.) in parallel operation safely the polarity has to be checked out by this device for getting the expected result. As it has been designed in very simple way and it's components are also not too much costlier, it can be easily acceptable for any one.

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