Electronics

Mini Project

Wireless AC Power Detector

Group members---

Aayushi Pohiya 191113050

Yashvi Sahu 191113063

Priyanshi Sahu 191113220

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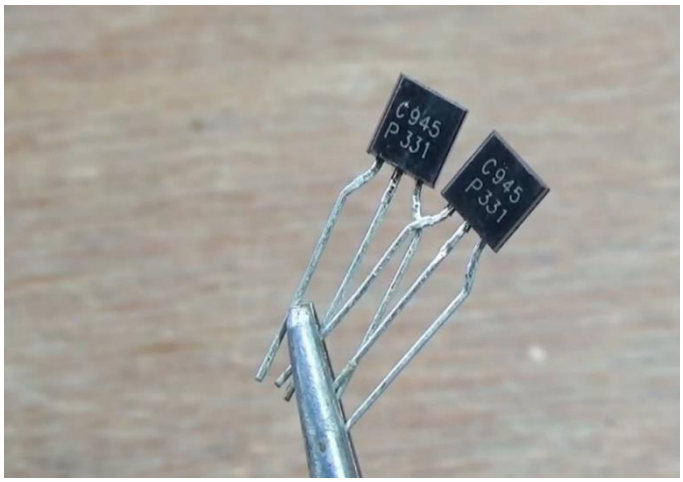
Importance of Wireless AC Power Detector

In Industries accident takes place due to leakage of electricity. The accidents can be avoided by using the wireless AC power detector. The motive of this project is to detect presence of electricity wirelessly.

Many of us know what an electric shock is, isn't it? Right from the day of advent of commercial distribution of electricity till today we have many live wires carrying AC current doing some harm or even sometimes killing some. This simple project has the capability to sense a flow of alternating current around its vicinity without even having a physical contact with the live wire. The concept of working behind this project is that a live wire has alternating current flowing through it. These also radiate from the wires and hence can be felt by a nearby sensing circuit which is properly tuned to do so.

Hardware Specifications--

• Two transistor

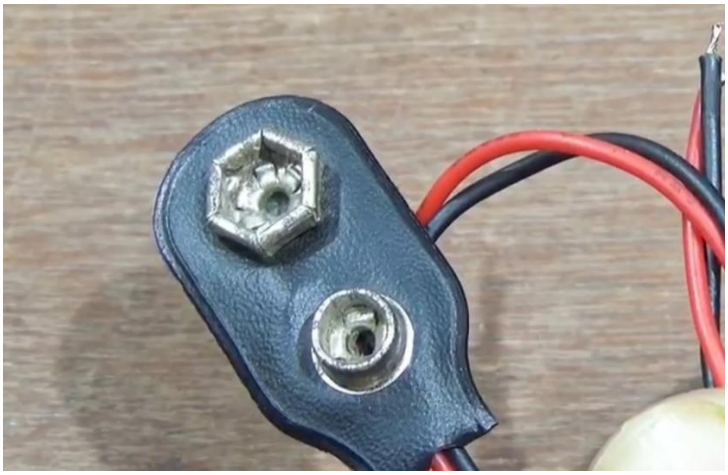


- LED

- Resistor

• 9V battery

• Connector



Construction—

STEP 1: CONNECTING THE TRANSISTORS

- Bend the collector of transistor 1 ninety degrees
- Bend the base of transistor 1 all the way over the transistor
- Bend the collector of transistor 2 ninety degrees
- Connect the emitter from transistor 1 to the base of transistor 2
- Connect the collector from transistor 1 to the collector of transistor 2
- Cut off the protruding ends
- Bend the protruding end where the collectors are connected 90 degrees

STEP 2: CONNECTING THE RESISTANCE

The second transistor controls the LED. A resistor must intervene here to protect the LED. In this circuit I am using a 220 ohm resistor.

The resistor can be placed in front of or behind the LED and works the same in both directions. To keep the whole compact so that it can be placed on the battery connector later, it comes directly after the transistor.

- Solder the resistor to the emitter (output) of the second transistor.
- Bend the other pin 90 degrees and cut it shortly after the bend.

STEP 3: CONNECTING THE LED

- Bend the anode (+) of the LED 90 degrees and cut it to a few millimeters.
- Solder the anode to the resistor.
- Cut the cathode (-) to the same length as the pin protruding from the connected emitters.

The 2 protruding pins should have about the same pitch as the 2 connectors of the battery connector. This is because the whole can be mounted on the battery connector later.

STEP 4: PREPARE THE CONNECTOR.

The whole is mounted on the connector in the next step. For this, the connector must first be adjusted a little.

- Cut the wires coming out of the connector.
- Drill 2 small holes of about 2 millimeters through the connector.

STEP 5: MOUNT THE CONNECTOR

- Slide the 2 protruding pins through the connector.
- Solder the pins to the connector.

The pin of the collectors to the + connector, the pin of the cathode of the LED comes to the - connector.

STEP 6: INSTALL THE ANTENNA

A antenna is attached to the base connection of transistor 1. This receive the electromagnetic induction from the AC circuit.

STEP 7: READY

The Wireless AC Power Detector is ready!

About circuit --

In this circuit, an antenna (spring) is connected to the base of first transistor. When we place this antenna near an object that is AC energized, a small current gets induced into the antenna due to electromagnetic induction. This current triggers the first transistor.

Output of the first transistor triggers the second. The second transistor switches on the LED indicating that AC voltage is present.