

# Security Alarm System based upon PIR Sensor

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# PIR sensor based Alarm

Introduction

Circuit Diagram

Components

Circuit Analysis

Circuit Analysis

Circuit Analysis

Circuit Analysis

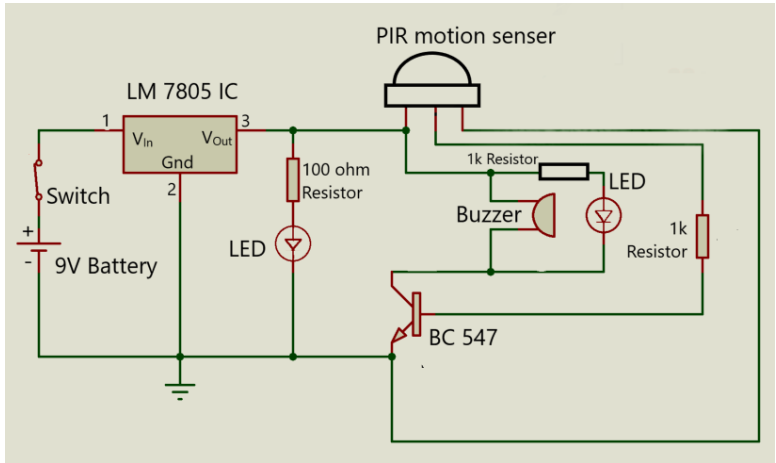
Results

A simple PIR sensor based Alarm system works upon motion detection.

It Detects motion by monitoring fluctuations in surrounding IR radiations.

When the PIR sensor detects a change in IR radiations, it sends a high current to BC 547 transistor which closes the buzzer circuit and a sound is produced. This circuit works on the same principle

- Introduction
- Circuit Diagram**
- Components
- Circuit Analysis
- Circuit Analysis
- Circuit Analysis
- Circuit Analysis
- Results



# Components

The main components of this circuit are:

## 1. PIR Sensor

- Detects IR radiations.
- Uses a Fresnel lens that focuses IR on a Pyroelectric sensor.
- Pyroelectric sensor generates electric signal upon fluctuating IR radiation.

## 2. LM 7805 IC

- Restricts output voltage to 5V for various ranges of input voltages.

## 3. BC 547

- NPN transistor for quick switching.

# Current Flow and Direction

Introduction  
Circuit Diagram  
Components  
Circuit Analysis  
Circuit Analysis  
Circuit Analysis  
Circuit Analysis  
Results

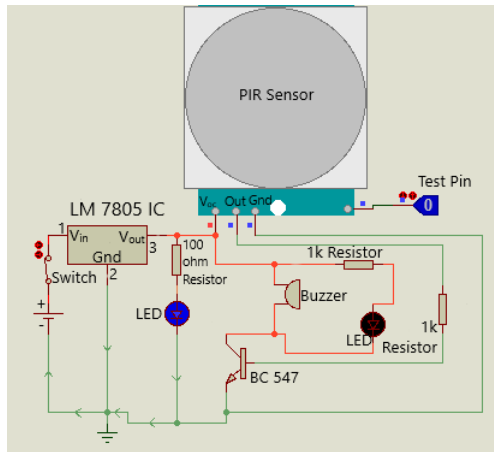


Figure: Current Direction when PIR sensor is in idle state

# Current Flow and Direction

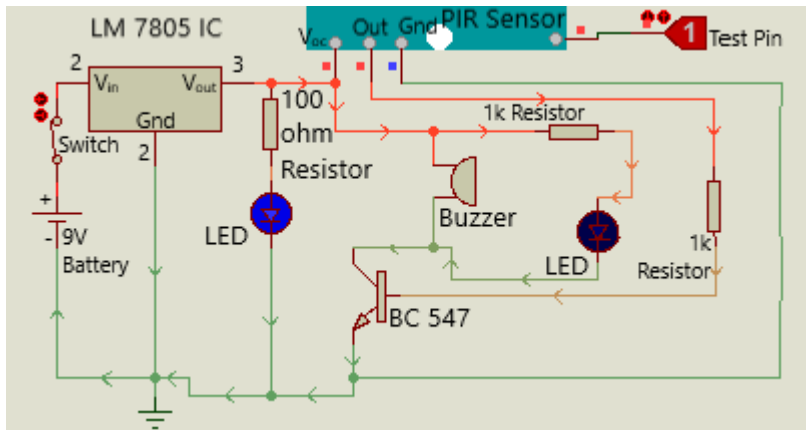
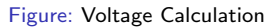


Figure: Current Direction when PIR sensor is in on state

- Introduction
- Circuit Diagram
- Components
- Circuit Analysis
- Circuit Analysis
- Circuit Analysis**
- Circuit Analysis
- Results



# Current Measurement

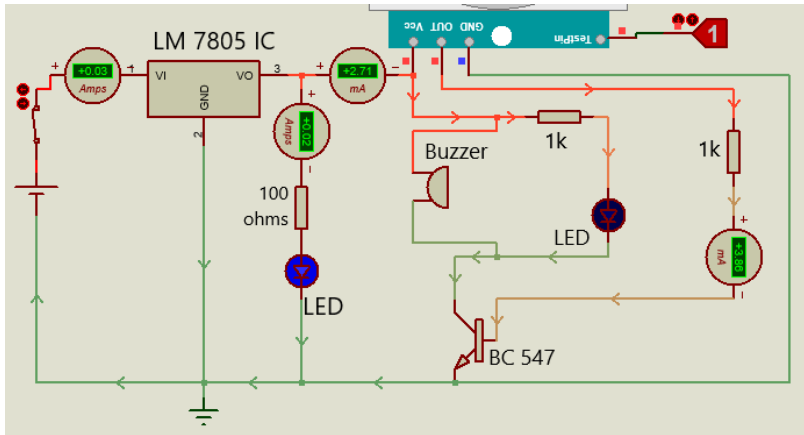


Figure: Current Calculation



# Results

We compare the simulation and manual calculations.

## Simulation Values

## Manual Values

**9V**

**V<sub>cc</sub>**

**6.5V**

**5V**

**LM 7805**

**4.96V**

**2.28V**

**LED 100 ohm Res**

**2.17V**

**1.06V**

**Transistor Base**

**1.10V**

Introduction  
Circuit Diagram  
Components  
Circuit Analysis  
Circuit Analysis  
Circuit Analysis  
Circuit Analysis  
**Results**

# THANKS