

Fire Alarm

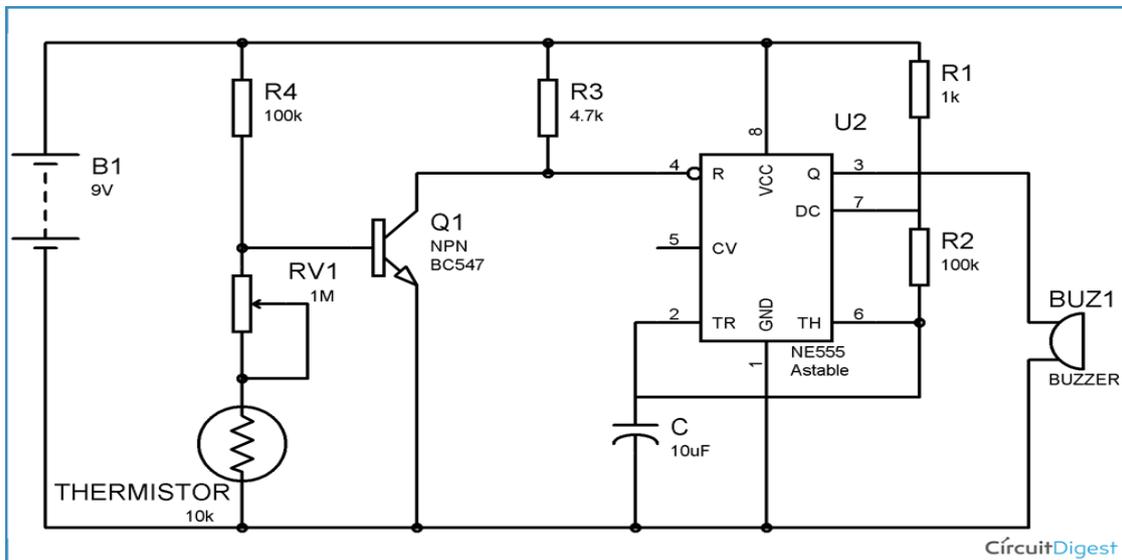
Introduction

Fire alarms are prime necessities in modern buildings and architectures, especially in banks, data centers and gas stations. They detect the fire in the ambient at a very early stage by sensing smoke or/and heat and raise an alarm which warns people about the fire and furnishes sufficient time to take preventive measures. It not only prevents a big loss caused by a deadly fire but sometimes proves to be a life saver. Here we are building one simple fire alarm system with the help of 555 Timer IC, which will sense the fire (temperature rise in surrounding), and trigger the alarm. The key component of the circuit is Thermistor, which has been used as a fire detector or fire sensor. Thermistor is a temperature sensitive resistor, whose resistance changes according to the temperature, its resistance decreases with the increase in temperature and vice versa. We have built the circuit using, mainly three components that is Thermistor, NPN transistor and 555 Timer IC.

Working Concept

Here the 555 timer IC has been configured in an astable mode so that the Alarm (Buzzer) can produce an oscillating sound. In an astable mode, capacitor C charges through resistance R1 and R2, till $\frac{2}{3} V_{CC}$ and discharges through R2 till it reaches to $\frac{1}{3} V_{CC}$. During the charging time OUT PIN 3 of 555 IC remains HIGH and during discharging it remains LOW, that's how it oscillates. We have connected a Buzzer to OUT pin, so that it produces a beep sound, when 555 is high. We can control the oscillation frequency of the alarm by adjusting the value of R2 and/or capacitor C.

Circuit Diagram



Component

- 555 Timer IC
- NPN Transistor BC547
- Thermistor (10K)
- Resistors (1K, 100K, 4.7K)
- Variable resistor (1M)
- Capacitor (10uF)
- Buzzer and Battery (9v)

Application

- Fire Alarm Circuits are very useful in homes, offices, schools, labs, etc. to detect and prevent any disasters due to fire.

- Fire Alarm Systems can work as a stand – alone devices or be a part of a complex home security system with other security features like smoke detection, intruder alert, motion detection, etc.