

Password Based Door Lock System Using 8051 Microcontroller

Mrs.Sapna Gangrade¹, Abdul Muqeed², Farhan Ahmed Siddiqui³, Md Adnan Khan⁴

¹Assistant Professor Department of ECE, Lords Institute of Engineering and Technology
Hyderabad, India

^{2,3,4,5}Department of ECE, Lords Institute of Engineering and Technology Hyderabad, India

Abstract

This circuit can be used as a warning device which triggers an alarm whenever the temperature exceeds a preset level. The project is built around AT89S52 microcontroller and uses 5 volts power supply. It detects fire and automatically switches on the motor and buzzer. It can be used to detect fire and to control fire. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Introduction

The project is built around AT89S52 microcontroller and uses 5 volts power supply. It detects fire and automatically switches on the motor and buzzer. It can be used to detect fire and to control fire. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Literature Survey

The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79 regulators provide fixed negative regulated voltages from 5 to 24 volts. Voltage regulator ICs are available with fixed (typically 5, 12 and 15V) or variable output voltages. They are also rated by the maximum current they can pass. Negative voltage regulators are available, mainly for use in dual supplies. Most regulators include some automatic protection from excessive current ('overload protection') and overheating ('thermal protection'). Many of the fixed voltage regulator ICs have 3 leads and look like power transistors, such as the 7805 +5V 1Amp regulator. They include a hole for attaching a heat sink if necessary.

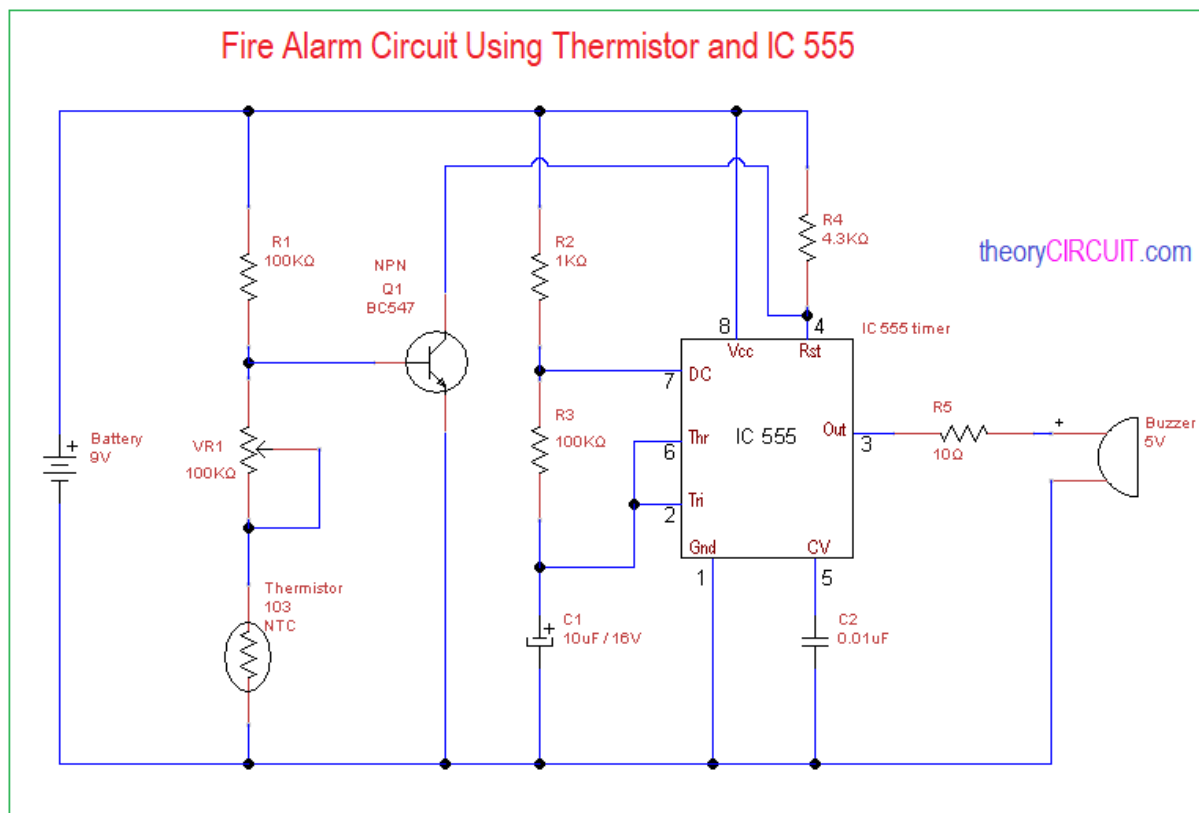
Working Principle

.Transformers convert AC electricity from one voltage to another with little loss of power. Transformers work only with AC and this is one of the reasons why mains electricity is AC.

Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high mains voltage (230V in India) to a safer low voltage. The input coil is called the primary and the output coil is called the secondary. There is no electrical connection between the two coils; instead they are linked by an alternating .

The transformer will step down the power supply voltage (0-230V) to (0- 6V) level. Then the secondary of the potential transformer will be connected to the bridge rectifier, which is constructed with the help of PN junction diodes. The advantages of using a bridge rectifier are it will give peak voltage output as DC.

Schematic Diagram



HARDWARE DESCRIPTION

a. Power Supply

The power supply section is the section which provides +5V for the components to work. IC LM7805 is used for providing a constant power of +5V.

The ac voltage, typically 220V, is connected to a transformer, which steps down the ac

voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also retains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

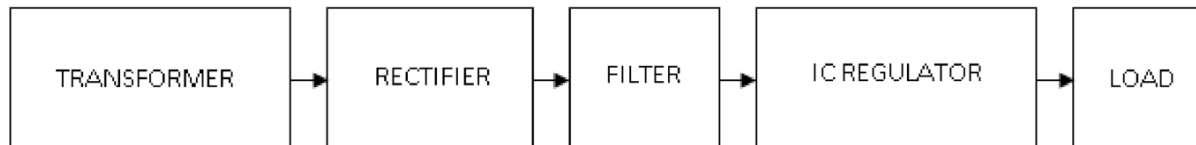


Figure 3.1 Block Diagram of Power Supply

b. Microcontroller

A Microcontroller (or MCU) is a computer-on-a-chip used to control electronic devices. It is a type of microprocessor emphasizing self-sufficiency and cost-effectiveness, in contrast to a general-purpose microprocessor (the kind used in a PC). A typical microcontroller contains all the memory and interfaces needed for a simple application, whereas a general purpose microprocessor requires additional chips to provide these functions.

A microcontroller is a single integrated circuit with the following key features:

- ☐ central processing unit - ranging from small and simple 8-bit processors to sophisticated 32- or 64-bit processors
 - ☐ input/output interfaces such as serial ports
 - ☐ RAM for data storage
 - ☐ ROM, EEPROM or Flash memory for program storage
 - ☐ Clock generator - often an oscillator for a quartz timing crystal, resonator or RC circuit
- Microcontrollers are inside many kinds of electronic equipment (see embedded system).

They are the vast majority of all processor chips sold. Over 50% are "simple" controllers, and another 20% are more specialized digital signal processors (DSPs) (ref?). A typical home in a developed country is likely to have only one or two general-purpose microprocessors but somewhere between one and two dozen microcontrollers. A typical mid range vehicle has as many as 50 or more microcontrollers. They can also be found in almost any electrical device: washing machines, microwave ovens, telephones etc.

An automatic fire alarm system is designed to detect the unwanted presence of fire by monitoring environmental changes associated with combustion. In general, a fire alarm system is classified as either automatically actuated, manually actuated, or both. Automatic fire alarm systems are intended to notify the building occupants to evacuate in the event of a fire or other

emergency, report the event to an off-premises location in order to summon emergency services, and to prepare the structure and associated systems to control the spread of fire and smoke.

- Fire alarm control panel: This component, the hub of the system, monitors inputs and system integrity, controls outputs and relays information.
- Primary Power supply: Commonly the non-switched 120 or 240 Volt Alternating Current source supplied from a commercial power utility. In non-residential applications, a branch circuit is dedicated to the fire alarm system and its constituents. "Dedicated branch circuits" should not be confused with "Individual branch circuits" which supply energy to a single appliance.
- Secondary (backup) Power supplies: This component, commonly consisting of sealed lead-acid storage batteries or other emergency sources including generators, is used to supply energy in the event of a primary power failure.
- Initiating Devices: This component acts as an input to the fire alarm control unit and are either manually or automatically actuated. Examples would be devices like pull stations or smoke detectors.
- Notification appliances: This component uses energy supplied from the fire alarm system or other stored energy source, to inform the proximate persons of the need to take action, usually to evacuate. This is done by means of a flashing light, strobe light, electromechanical horn, speaker, or a combination of these devices.
- Building Safety Interfaces: This interface allows the fire alarm system to control aspects of the built environment and to prepare the building for fire and to control the spread of smoke fumes and fire by influencing air movement, lighting, process control, human transport and exit.

Fire sensor used

The St-1KL3B are high sensitivity NPN silicon photo transistors mounted on durable, hermetically sealed To-18 metal cans or a plastic can providing years of reliable performance even under demanding conditions such as use outdoors.

Features

- TO-18 can type with lens
- high reliability
- with the base terminal
- narrow angular response

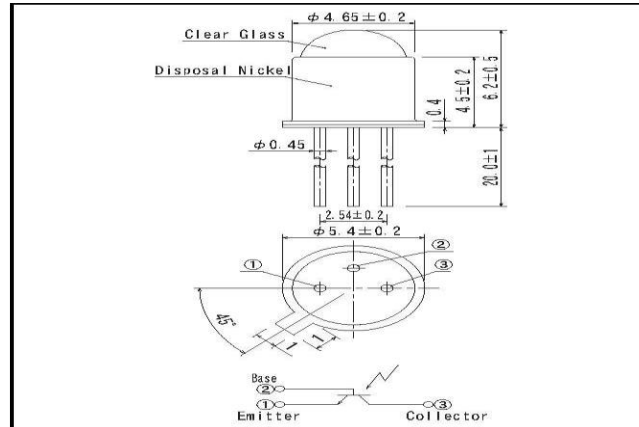
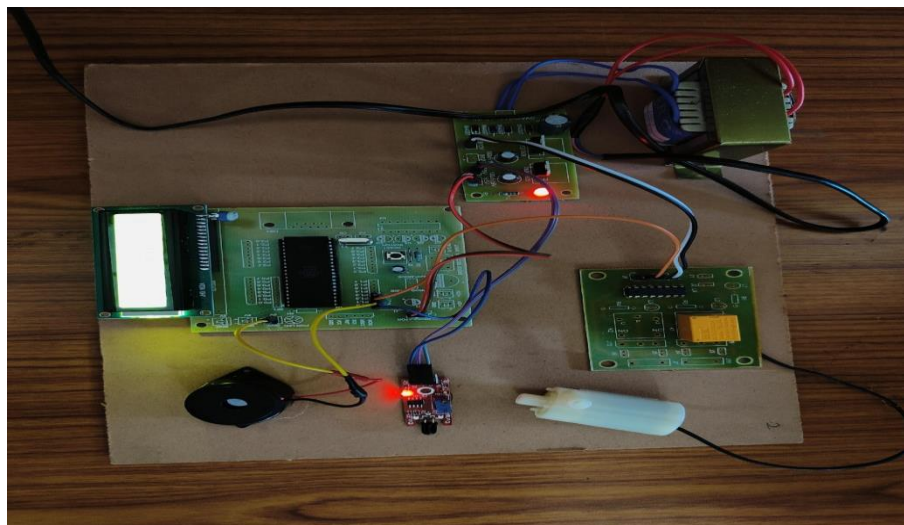


Fig:

The common-collector amplifier (Fig. 2) generates an output which transitions from a low state to a high state when IR light is detected by the phototransistor. The output is created by connecting a resistor between the emitter pin of the component and ground. The output is read at the emitter terminal.

This output terminal is connected to a comparator's non-inverting terminal.

Result & Discussion



Conclusion

The project “**Fire Alarm Circuit**” has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly using highly advanced IC's and with the help of growing technology the project

has been successfully implemented

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