

**DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
College of Engineering and Technology
SRM Institute of Science and Technology**

MINI PROJECT REPORT

ODD Semester, 2023-24

Lab code & Name : 21ECC211L- Devices and Digital IC Lab

Year & Semester : II Year, IV semester

Project Title : ***LASER BASED. SECURITY ALARM SYSTEM***

Course Teacher : **Mr.M.Mario Dominic Savio**

Electronics and Communication Department

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 Yash Meena. (552)
 Om Shukla. (533)

Reg. No →	Abhishek kumar	Yash Meena	Om Shulka
Mark split up ↓	RA2211004 010547	RA2211004 010552	RA221100 4010533
Novelty in the project work (10 marks)			
Level of understanding of the design formula (5 marks)			
Contribution to the project (5 Marks)			
Report writing (10 Marks)			
Total (30 Marks)			

Date:

Signature of Course Teacher

LASER BASED SECURITY ALARM SYSTEM

OBJECTIVE:

The objective of a laser-based security alarm system is to detect unauthorized intrusions by utilizing laser beams as a trigger mechanism. This system aims to provide a reliable and efficient means of securing an area by instantly detecting disruptions in the laser beams, subsequently triggering an alarm to alert security personnel or occupants.

ABSTRACT:

The automatic bathroom light off timer is built around IC 555 timer which will turn off the light after a preset time.

The main advantages of this circuit are when there is no one in the bathroom it will automatically switch off the light after preset time, thus saving electricity. Once timer switches off it will not reset automatically until we supply power. Consume no current in standby mode therefore longer battery life. Provide facility to set time according to the requirement. It can be easily mounted.

INTRODUCTION:

The Laser-Based Security Alarm System represents a cutting-edge approach to safeguarding environments with heightened precision. Leveraging advanced laser technology, this system is designed to create an impervious perimeter, relying on strategically placed laser beams. Intricately woven into the fabric of modern security, the system acts as a vigilant sentinel, promptly detecting any breach of its laser web. This introduction explores the innovative features and applications that make the Laser-Based Security Alarm System an indispensable asset in the realm of contemporary security solutions.

HARDWARE REQUIREMENT/DESCRIPTION:

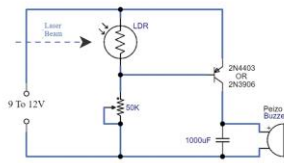
- 1:-LDR
- 2:-Transistor BC547
- 3:-LED
- 4:-Buzzer
- 5:-Resistor
- 6:-Bredboard

CIRCUIT/COMPONENT SPECIFICATIONS:

Supply voltage (V_{CC})	4.5 to 15 V
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Supply current ($V_{CC} = +5\text{ V}$)	3 to 6 mA
Output current (maximum)	200 mA
Power consumption (minimum operating)	30 mW@5V
Operating temperature	0 to 70 °C

CIRCUIT DIAGRAM:



DESIGN ISSUES:

- Maximum supply voltage should not exceed 15V
- Humidity should not exceed 85% relative humidity.
- Timing tolerance should not exceed +10 sec for 1 min.

RESULTS:

The result of a laser-based security alarm system is a robust and responsive defense mechanism against unauthorized access. By utilizing laser beams as a virtual barrier, the system can promptly detect any disruption, triggering an immediate alarm. This real-time response enhances security measures, allowing for swift intervention and mitigating potential threats. Additionally, the system's adaptability makes it suitable for various applications, ranging from residential properties to high-security installations, ensuring a reliable safeguard against intrusions.

CONCLUSIONS:

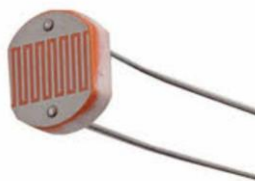
In conclusion, the laser-based security alarm system stands as a formidable solution in the realm of contemporary security technologies. Its ability to establish a precise and impenetrable perimeter, coupled with real-time detection capabilities, makes it a reliable safeguard against unauthorized access.

REFERENCES:

www.engineersgarage.com/electronic-circuits/bathroom-light-timer

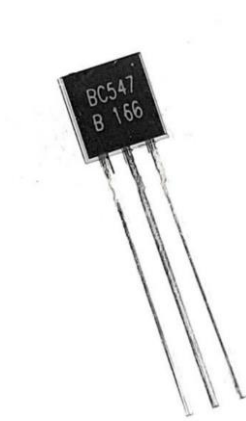
APPENDIX:**LED :**

LEDs are Light Emitting Diodes. They are super compact and do not emit heat ; most commonly used in emergency lightings, automotive tail lights.

LDR:

LDR stands for "Light Dependent Resistor." It is a type of resistor whose resistance changes with the amount of light falling on it. LDRs are commonly used in electronic circuits, particularly in applications like light-sensitive switches, dusk-to-dawn lighting controls, and ambient light sensing in cameras. The resistance of an LDR decreases with an increase in light intensity, making it a valuable component in devices where light levels need to be detected or controlled.

TRANSISTOR:



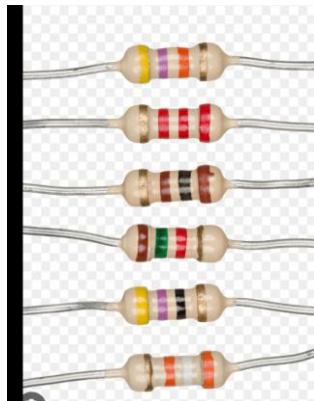
The BC547 is a commonly used NPN bipolar junction transistor (BJT). It is part of a family of general-purpose transistors and is widely employed in electronic circuits for amplification and switching purposes. The BC547 transistor has three terminals: the collector (C), the base (B), and the emitter (E). It is known for its low noise and high amplification characteristics, making it suitable for a variety of applications in audio amplifiers, signal processing circuits, and other electronic projects. The BC547 is often used in small-signal amplification due to its versatility and widespread availability.

BUZZER:



A buzzer is an electrical device that produces a buzzing or beeping sound. It's commonly used in various applications, such as alarms, timers, and electronic games. The sound is typically generated by a vibrating membrane or an oscillating circuit. Buzzers come in different types, including piezoelectric and electromagnetic, each with its own method of producing sound.

RESISTOR:



A resistor is an electrical component that restricts or limits the flow of electric current in a circuit. It's commonly used to control the amount of current flowing through a particular part of a circuit, protect components, and set specific voltage levels. Resistors are measured in ohms (Ω) and come in various types, such as fixed resistors

with a constant resistance value or variable resistors (potentiometers) that allow adjustment of resistance.

