

Project-I Report  
On  
**UV LIGHT SANITIZER**  
submitted towards the partial fulfillment of the requirement for the  
award of the degree of  
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in Engineering physics

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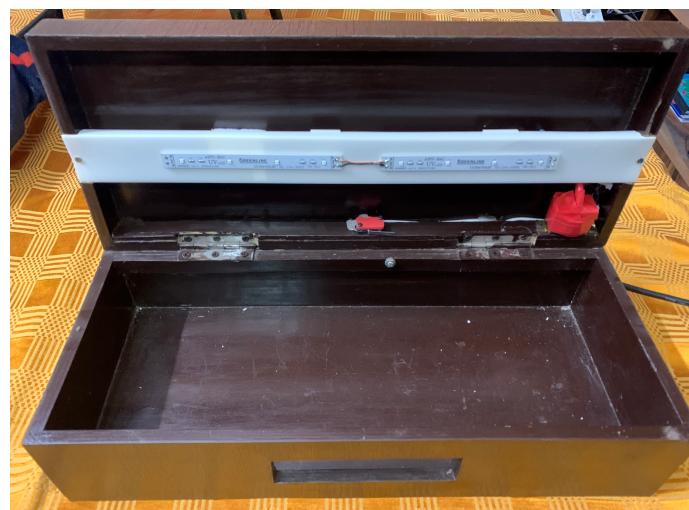
## ABSTRACT

In this period of Global pandemic Covid 19 there is a need for sanitize everything.

The liquid sanitizer available in the market can sanitize only certain things which don't get spoil on getting wet like our hands etc.

But there are many things which cannot be sanitize with liquid sanitizer like electronics gadgets , mobile phone, computer keyboard, mouse etc.

So the idea is to built a Dry Sanitizer based on UV light, which can kill Virus and Bacteria if exposed for certain duration of 3 to 5 minutes.



## PRINCIPLE INVOLVED

Ultraviolet UV means beyond violet and refer to a range of electromagnetic waves with shorter wavelength ( high frequency and energy ) than visible violet light.

The **UV** region covers the **wavelength range** 100-400 nm

UV is divided into three types within reducing wavelength and increasing energy.

They are (1) UVA. , (2) UVB, (3) UVC , ONLY UVC (100-280 nm) has high energy enough to effectively kill microorganisms ( Bacteria and viruses).

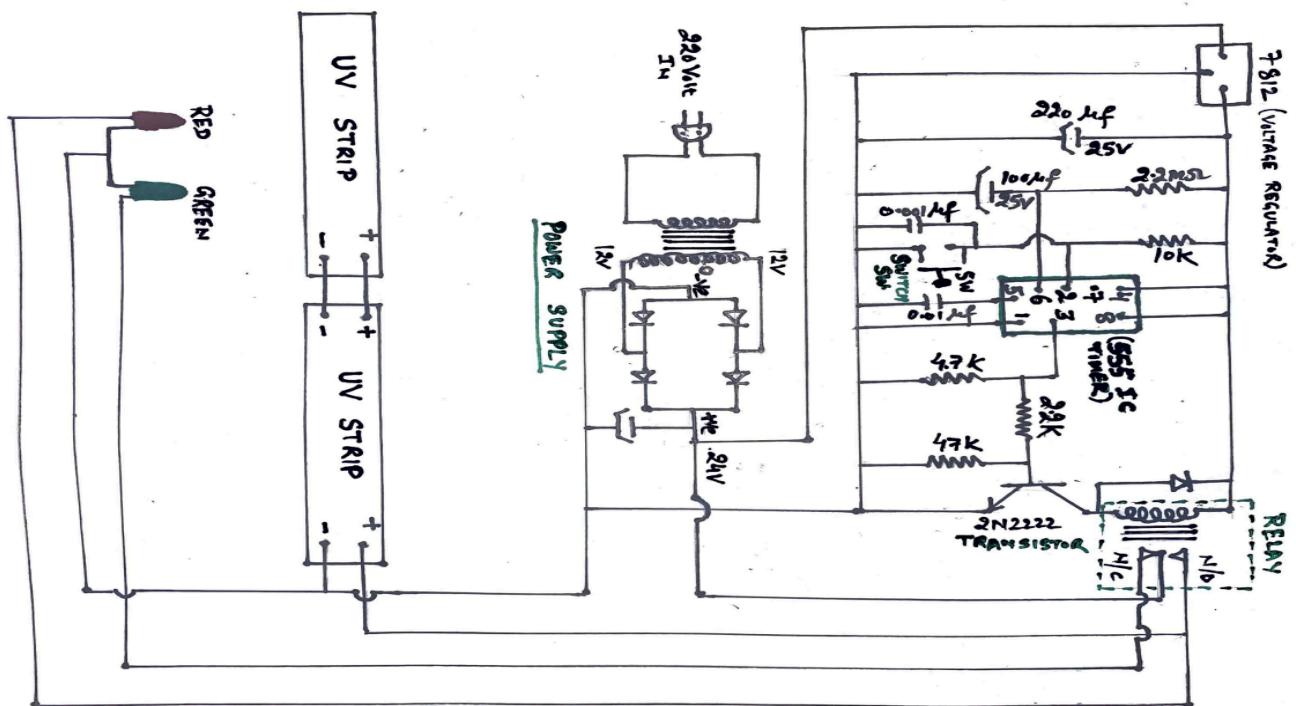
Studies has shown that UVC is effective against all foodborne, pathogens, natural microbacteria , and virus.

UV Sanitizer works by breaking down certain chemical bonds and scrambling the structure of DNA , RNA and proteins ,causing microorganism to be unable to multiply, when a microorganism is unable to multiply , it is considered dead, since it cannot reproduce within host and is no longer Infectious.

The killing dose (exposure time )of UV light depends on the sizes of microorganisms.

usually 3 to 5 minutes exposure is sufficient to kill all types of viruses.

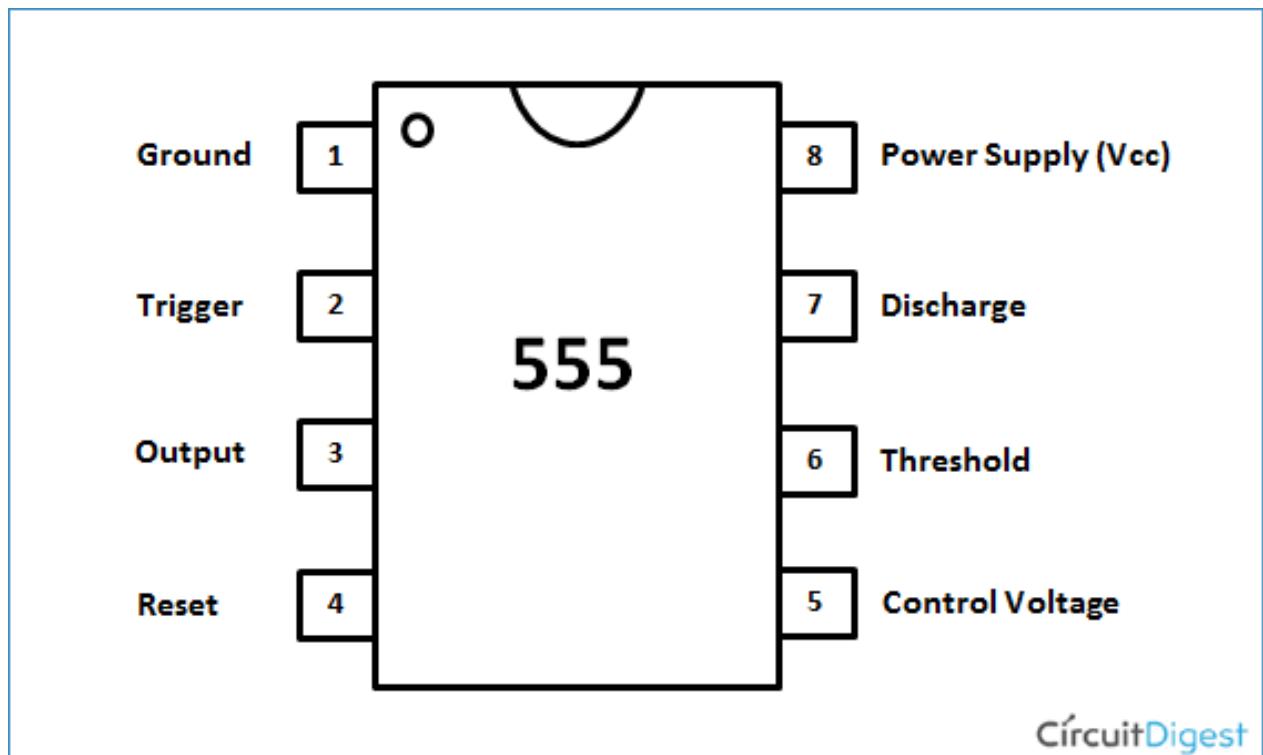
# UV SANITIZER CIRCUIT DIAGRAM



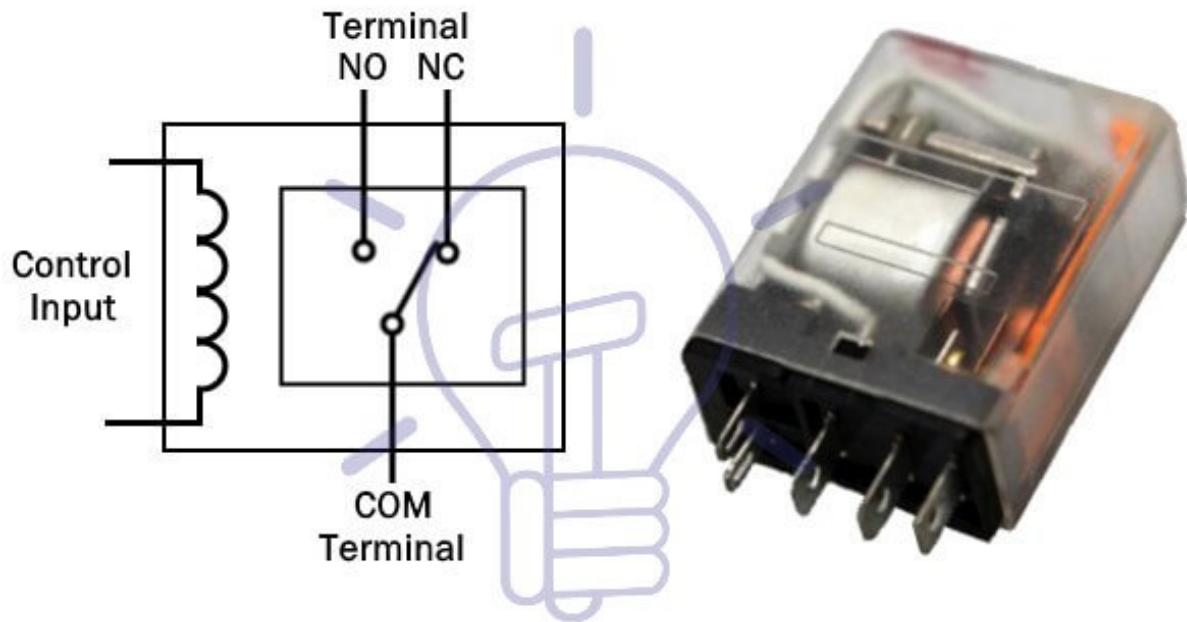
## ELECTRONICS INVOLVED

IC 555 AS TIMER -WE HAVE USED TIMER IC -555 FOR THE PURPOSE OF TIME CONTROLLED SANITIZATION.

WE HAVE SET A 5 MINUTE TIME LIMIT FOR SWITCHING ON OF UV LIGHTS BY USING PARTICULAR RESISTANCES



# RELAY



## ElectroMechanical Relay

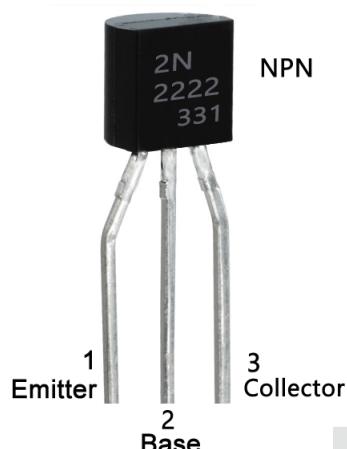
A relay can be defined as a switch. Switches are generally used to close or open the circuit manually . Relay is also a switch that connects or disconnects two circuits. But instead of manual operation a relay is applied with electrical signal, which in turn connects or disconnects another circuit

# Basics of 2N2222 TRANSISTOR

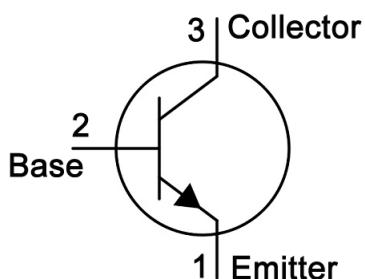
- 2N2222 is an NPN transistor
- It has three terminals named as:
  - Emitter.
  - Collector.
  - Base.
- It's a current controlled transistor.
- It has a Collector current of 800 mA.
- Power Dissipation of 2N2222 is 500mW.
- It can operate between -65 C to 200 C temperature.
  - Collector base voltage of 2n2222 is 60.
  - Collector Emitter Voltage of 2n2222 is 30.
  - Emitter Base voltage of 2n2222 is 5.

## 2N2222 Transistor Pinout

TO-92 Package



NPN



# **MATERIAL USED**

The components used for the UV Sanitizer box is as follows

- a. Relay
- b. UVC (100-280 nm) LED 2 No.
- c. 2N2222 NPN TRANSISTOR(AS SWITCH)(common emitter)
- d. IC -555 AS TIMER
- e. Power supply 24V DC 1 No.
- f. Box 1 No.
- g. Push switch 1 No.
- h. Misc. items

# INSTRUCTION FOR USE

## UV Sanitizer Box

- 1. This device work on Ultra violet rays and kills all the Bacteria and Virus**
- 2. This is to be done by the individual only.**
- 3. To sanitize the Key Board(KB), Mouse don't disconnect the Mouse and Key Board from working system**
- 4. Keep the Key Board, Mouse and Head Phone inside the box which has the provision keeping the KB/Mouse along with Wires.**
- 5. Press the Trigger once and the RED Led will light and indicate sanitizing is under process.**
- 6. When sanitization is under process / Red Led is on Please do not open the Box as it is Highly Dangerous for your Eyes and skin in the long run.**
- 7. After five minutes the Green Led will light automatically come indicating the sanitization is over.**
- 8. Now it is safe to open and take out the sanitized KB/Mouse etc.**

## **Advantages of LED UV sanitization**

1. UV light has been used for sterilization and disinfection as early as the mid-20th century.
2. UVC is capable of sanitizing almost anything including Glasses, Electronic Devices, Masks, Mobiles etc.
3. However, the UV is capable as a surface disinfectant only. That means all items should be open from respective packaging and placed inside the box.
4. It is convenient to use and no chemicals are needed. Therefore, you won't leave any chemical residue behind.
5. It is able to kill all kinds of microorganisms, including drug resistant bacteria and Virus.
6. The ability of the germicidal fluorescent lamp to produce UV light decreases with age but the LED UV does not decrease with age.
7. Energy efficient and Long Life