Autonomous Dark-Activated Switch

Introduction:

A dark activated switch is a circuit that senses the level of light and turns a relay on or off accordingly. Measure the light intensity using an LDR (Light Dependent Resistor). A switch that turns on a circuit or device when it gets dark. So when it's bright and there's a lot of light, the switch won't work. However, it activates as soon as it gets dark

Components:

- 2N2222 transistor
- 100k potentiometer
- 1N4001 diode
- 12v power supply
- LDR 2Mohm
- 1Kohm resistor
- 12v relay
- Breadboard
- Wires
- 220v bulb

Working:

The light falls on the surface of the LDR, the LDR changes its resistance. The more the light, the less the resistance of the LDR, the less the resistance, the less the voltage drop across it. The less the light, the more the resistance and thus the more the voltage drop across. As the voltage drop increases, so does the V_B of the 2N2222 transistor and therefore the I_{CE} increases accordingly, until the time that the current is enough to actuate the relay. The amount of light needed to actuate the relay can be changed by changing the 100K potentiometer. Basically, any change to the potentiometer will have an effect to the voltage drop of the LDR, as they are both members of the voltage divider described above. The 1N4001 diode is used to eliminate any back voltage when

the relay is disarmed. It is very important to have this diode because without it, the transistor may be damaged.

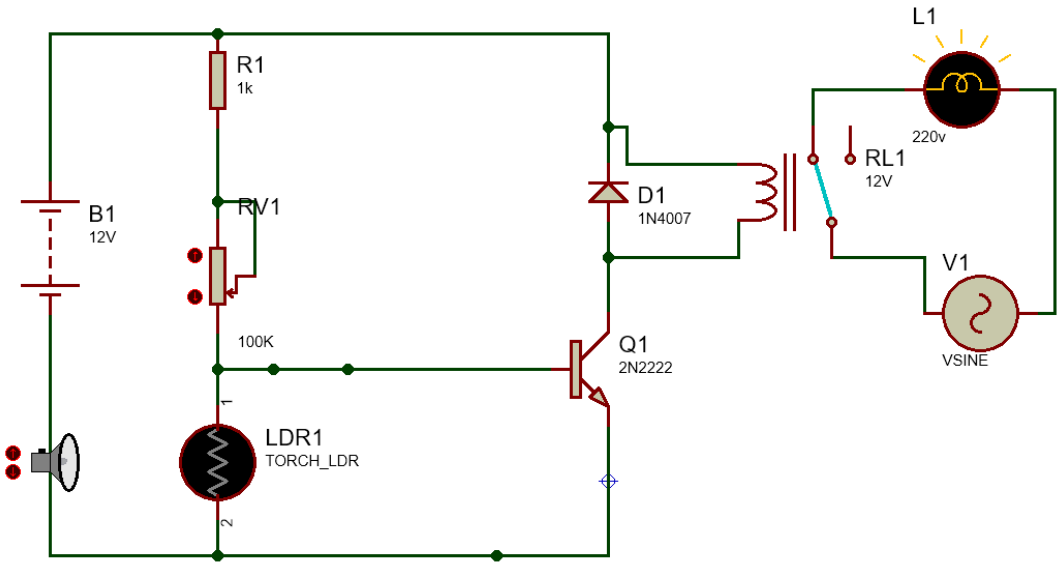

Figure 1 schematic diagram

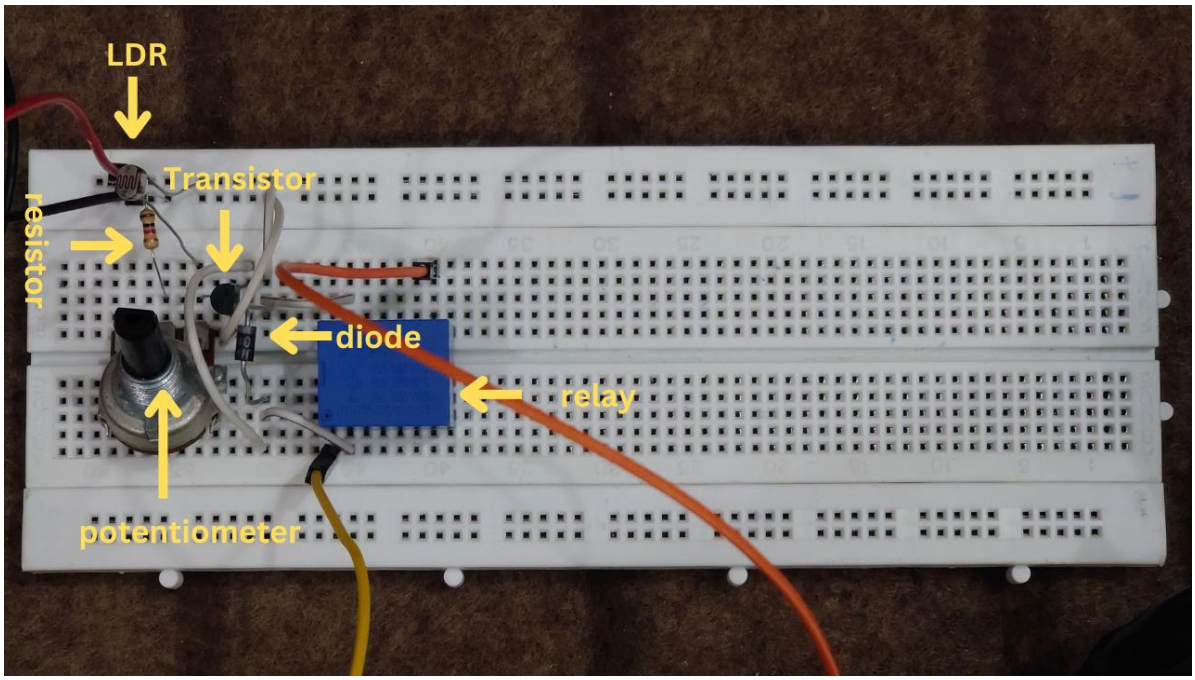

Figure 2 circuit on breadboard

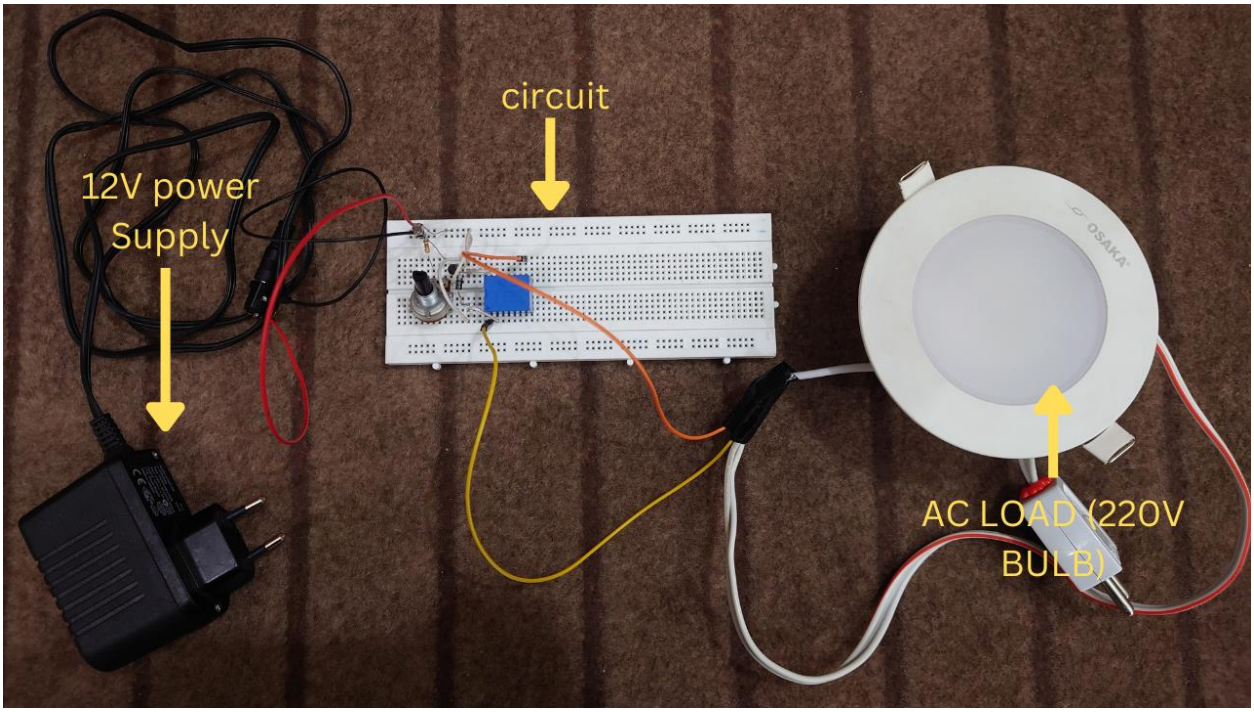

Figure 3 circuit with load and power supply