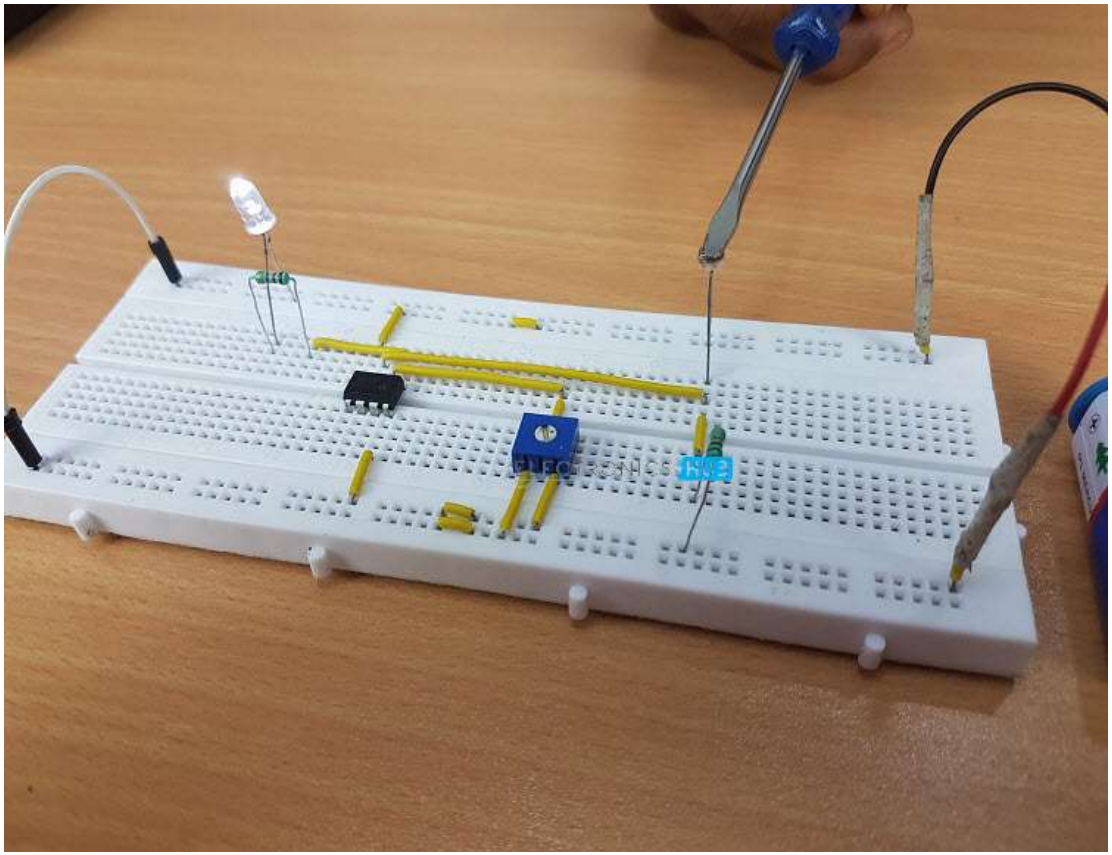
Light Detector using LDR and LM358

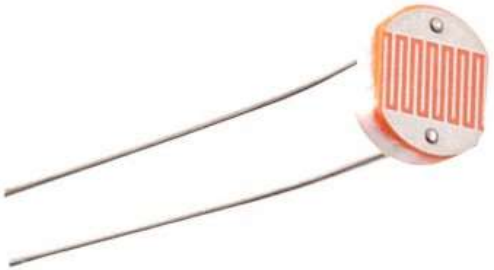


About project

- A Light Detector or a Light Sensor is a device or circuit that detects the intensity of the light incident on it. Different types of light detectors are LDRs (or Light Dependent Resistors), Photo Diodes, Photo Transistors, etc.
- In this project, we have designed a simple Light Detector using LDR and LM358 IC.
- We have connected the wiper terminal of the 10 KΩ Potentiometer to the inverting terminal of LM358. To the non – inverting terminal, we have connected the junction of a 10 KΩ Resistor and the LDR. These two will form a potential divider feeding its output to the LM358.

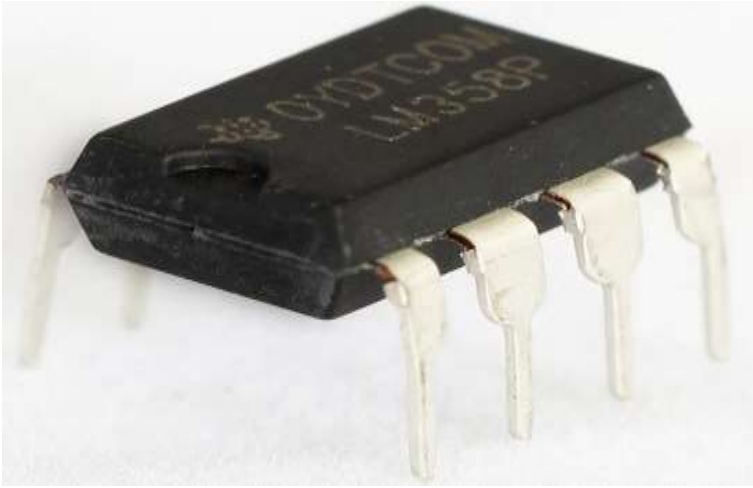
Light Dependent Resistor

An **LDR** is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light **sensing** circuits. A Light Dependent **Resistor** (**LDR**) or a photo **resistor** is a device whose resistivity is a **function** of the incident electromagnetic radiation. Hence, they are light sensitive devices. They are also called as photo conductors, photo conductive cells or simply photocells.

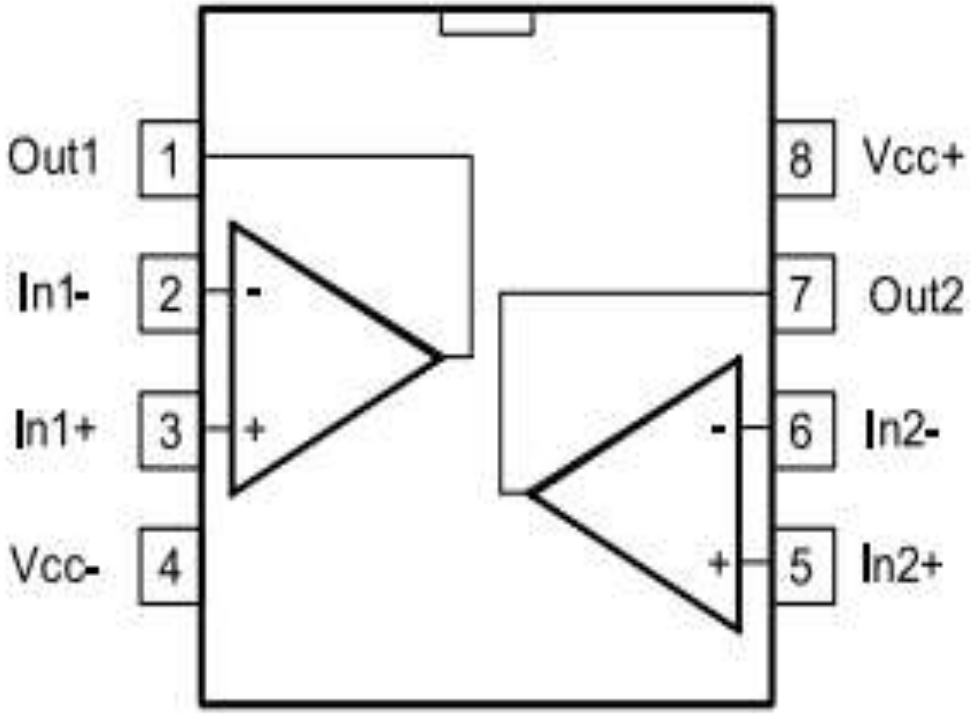


LM358 IC

The LM358 IC is a great, low power and easy to use dual channel op-amp IC. It is designed and introduced by national semiconductor. It consists of two internally frequency compensated, high gain, independent op-amps. This IC is designed for specially to operate from a single power supply over a wide range of voltages.



Pin configuration of LM358 IC



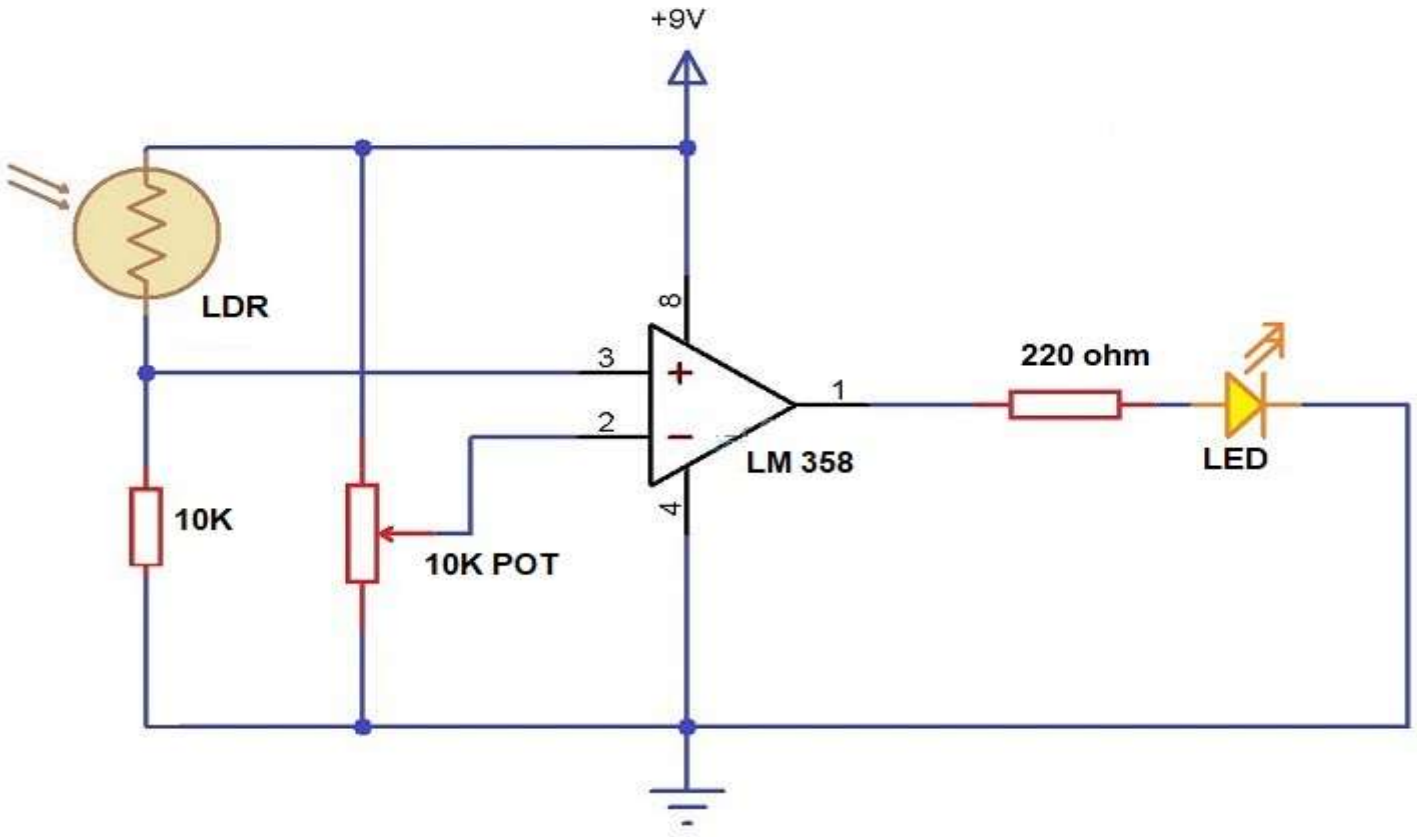
Working of project

- Typically, when light is incident directly on the LDR, its resistance will be very low and when there is no light i.e. in darker conditions, its resistance jumps to few mega Ohms.
- We will use this feature of the LDR is our project to detect light and turn on an LED. For this we have used an Operational Amplifier LM358. The Op – Amp is configured in comparator mode i.e. it will compare the voltages at inverting and non – inverting terminals and correspondingly generate a HIGH or LOW output.
- By adjusting 10k variable resistor, set the voltage at the pin 2 of LM358 which should be greater than the voltage at pin 3 of LM358.
- When there is no light on LDR, the voltage at the pin 3 is less than pin 2 and LED will be OFF. When light falls on LDR, the voltage at pin 3 becomes more than pin 2 and LED turns ON.

Components Required

- One LM358 IC
- One LDR
- One 10k Variable Resistor
- One 10k and One 220 ohm Resistors
- One Led
- One Breadboard
- One 9 Volt Battery
- One Battery Cap
- Connecting Wires

Connection Diagram



Project Link : https://youtu.be/nqCqjcOWd1E