

**B V RAJU COLLEGE, VISHNUPUR, BHIMAVARAM.**  
**DEPARTMENT OF PHYSICS & ELECTRONICS**

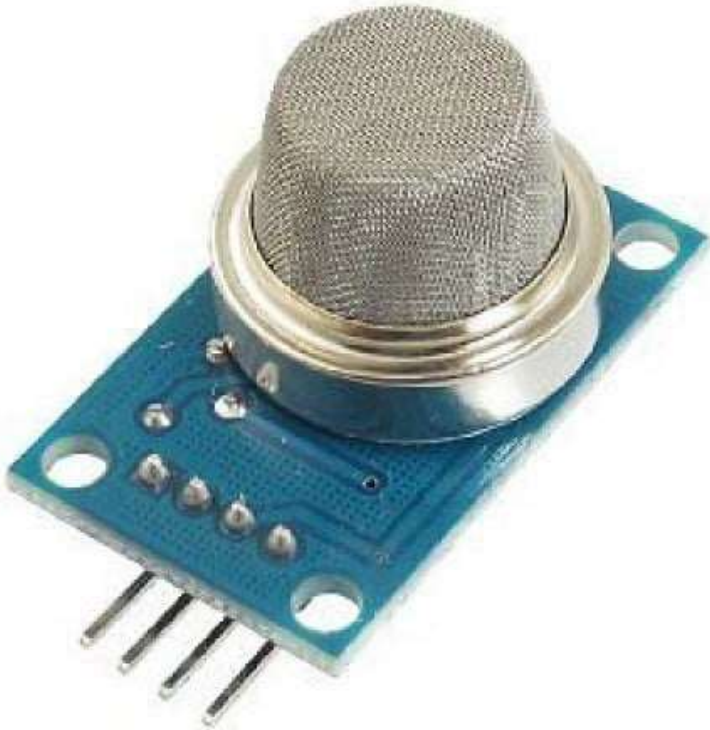
**PROJECT**

**MQ5 Methane LPG Liquid Propane Gas Sensor  
Module**

**Prepared by**  
**III B.Sc MPCs STUDENTS**

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# MQ5 Methane LPG Liquid Propane Gas Sensor Module



The Simple MQ-5 Methane LPG Liquid Propane [Gas Sensor](#) Module is a great way to add basic gas sensing to your project at a reasonable price. **The MQ-5 Methane LPG Liquid Propane Gas Sensor Module particulate sensor uses a Buzzer to sense any detected material that is even present in the air!**

This MQ-5 Methane LPG Liquid Propane Gas Sensor Module is widely used in gas leakage detecting pieces of equipment in family and industry, are suitable for **detecting LPG, natural gas, town gas, avoid the noise of alcohol and cooking fumes and cigarette smoke**

The MQ5 ( MQ-5 ) is used in gas leakage detecting equipment in consumer and industry applications, this sensor is suitable for detecting LPG, natural gas, coal gas. Avoid the noise of alcohol, cooking fumes, and cigarette smoke. The sensitivity can be adjusted by the potentiometer.

The sensitive material of the MQ-5 gas sensor is tin Oxide ( $\text{SnO}_2$ ), which with lower conductivity in clean air. When the target combustible gas exists, The sensor's conductivity is higher along with the gas concentration rising. Please use a simple electro circuit, Convert the change of conductivity to the corresponding output signal of gas concentration.

MQ-5 gas sensor has a high sensitivity to Methane, Propane, and Butane, and could be used to detect both Methane and Propane. The sensor could be used to detect different combustible gas especially Methane, it is with low cost and suitable for different application

## Connections

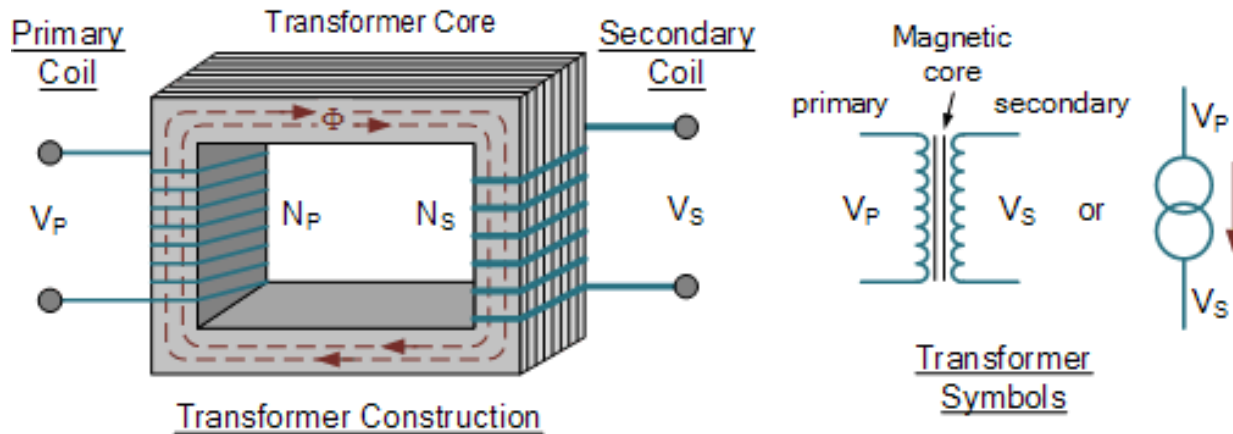
**VCC** ↔ 2.5V ~ 5.0V

**GND** ↔ ground

**Aout** ↔ *MCU.IO (analog output)*

**Dout** ↔ *MCU.IO (digital output)*

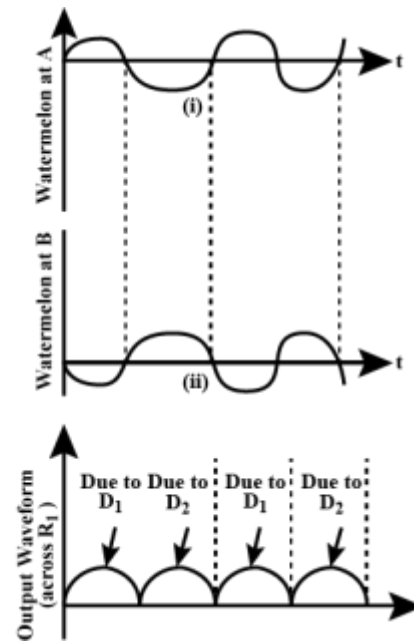
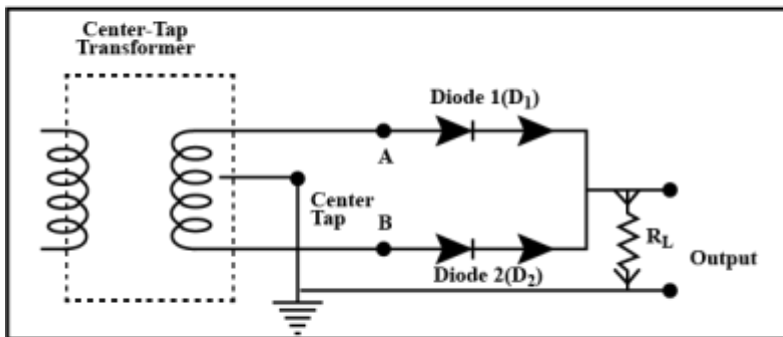
# Transformer



Transformer works on **Faraday's law of mutual induction**. Faraday's law of electromagnetic induction states that, when a change takes place in the magnetic flux which is linked with a circuit, an electromotive force current will induce in the circuit.

1. Transformer works on Faraday's law of mutual induction.
2. Faraday's law of electromagnetic induction states that, when a change takes place in the magnetic flux which is linked with a circuit, an electromotive force current will induce in the circuit.
3. The transformer consists of two separate winding placed over the laminated silicon steel core.
4. The winding to which AC supply is connected is called primary winding and to which load is connected is called secondary winding.
5. It works on the alternating current only because an alternating flux is required for mutual induction between the two winding.
6. When the AC supply is given to the primary winding with a certain voltage, an alternating flux sets up in the core of the transformer, which links with the secondary winding and as a result of it, an emf is induced in it called Mutually Induced emf.
7. The direction of this induced emf is opposite to the applied voltage.

# Rectifier circuit

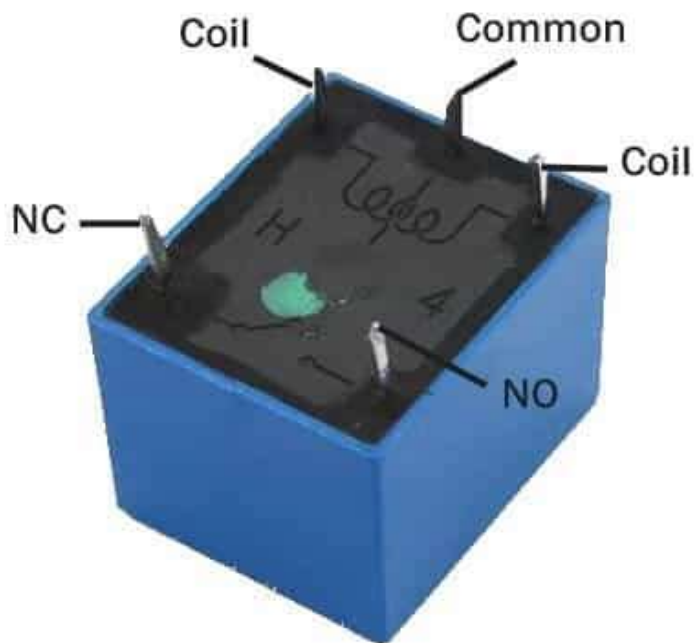


Rectifier is a device which converts AC in to DC.

During the positive half cycle appearing at A, the diode D<sub>1</sub> is forward biased, at the same time end B is negative and diode D<sub>2</sub> is reverse biased. The diode D<sub>1</sub> conducts. A current flow through the load resistor R<sub>L</sub> and output appears across R<sub>L</sub>

During negative half cycle appearing at A, the diode D<sub>1</sub> is reverse biased. End B is positive and diode D<sub>2</sub> is forward biased. The diode D<sub>2</sub> conducts. A current flow through R<sub>L</sub> in the same direction and output voltage appears across R<sub>L</sub>

# Relay



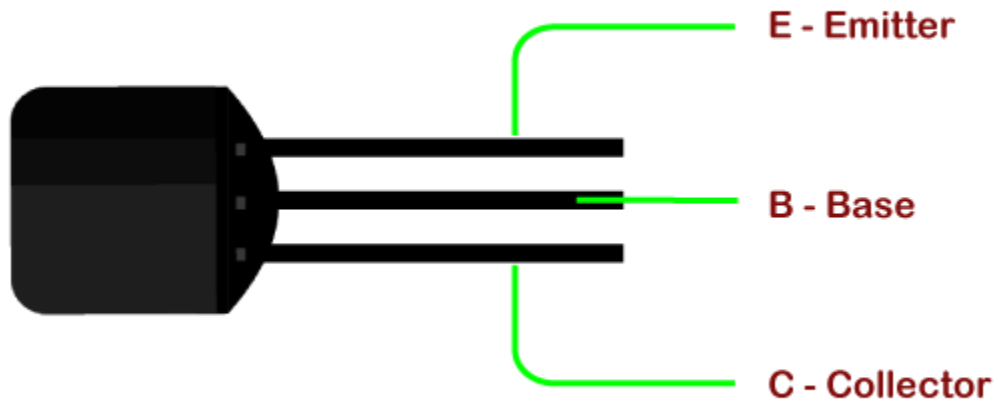
## Relay Terminals

A Relay is a simple electromechanical switch. While we use normal switches to close or open a circuit manually, a Relay is also a switch that connects or disconnects two circuits. But instead of a manual operation, a relay uses an electrical signal to control an electromagnet, which in turn connects or disconnects another circuit.

- Relay works on the principle of electromagnetic induction.
- When the electromagnet is applied with some current, it induces a magnetic field around it.
- Above image shows working of the relay. A switch is used to apply DC current to the load.
- In the relay, Copper coil and the iron core acts as electromagnet.
- When the coil is applied with DC current, it starts attracting the contact as shown. This is called energizing of relay.
- When the supply is removed it retrieves back to the original position. This is called De energizing of relay.

# Transistor

Parts of a Transistor



A transistor is a type of a semiconductor device that can be used to both conduct and insulate electric current or voltage. A transistor basically acts as a switch and an amplifier. In simple words, we can say that a transistor is **a miniature device that is used to control or regulate the flow of electronic signals.**

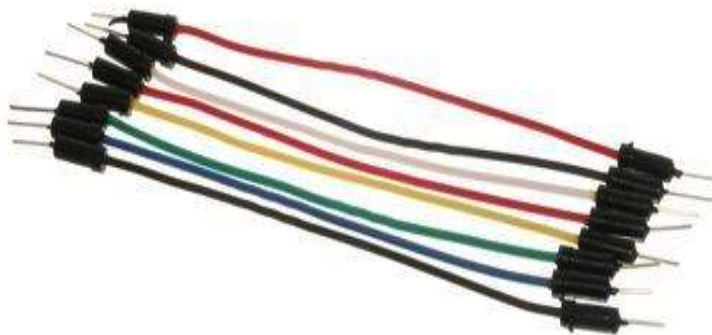


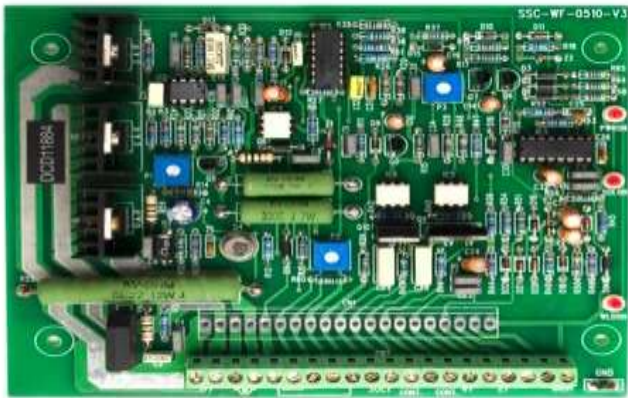
## Old mobile



Working old mobile is reused in this experiment.

## Connecting wires and PCB





connecting wires are used to connect all the elements and PCB is used for soldering.





