SNS COLLEGE OF TECHNOLOGY

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Department of Biomedical Engineering

Course Name: 23BMB101-Electron Devices and Circuits

I Year : II Semester

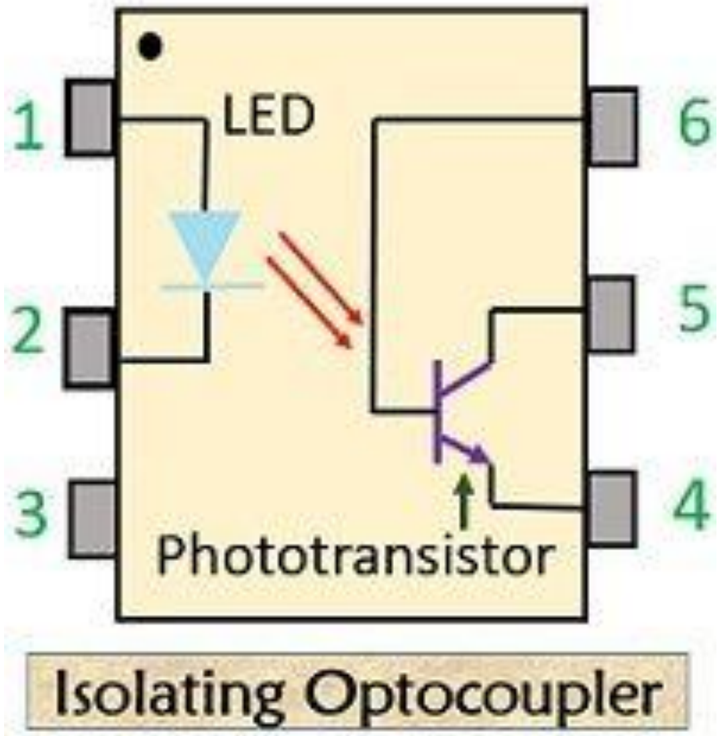
Unit II –Transistors

Topic : Optocouplers

INTRODUCTION

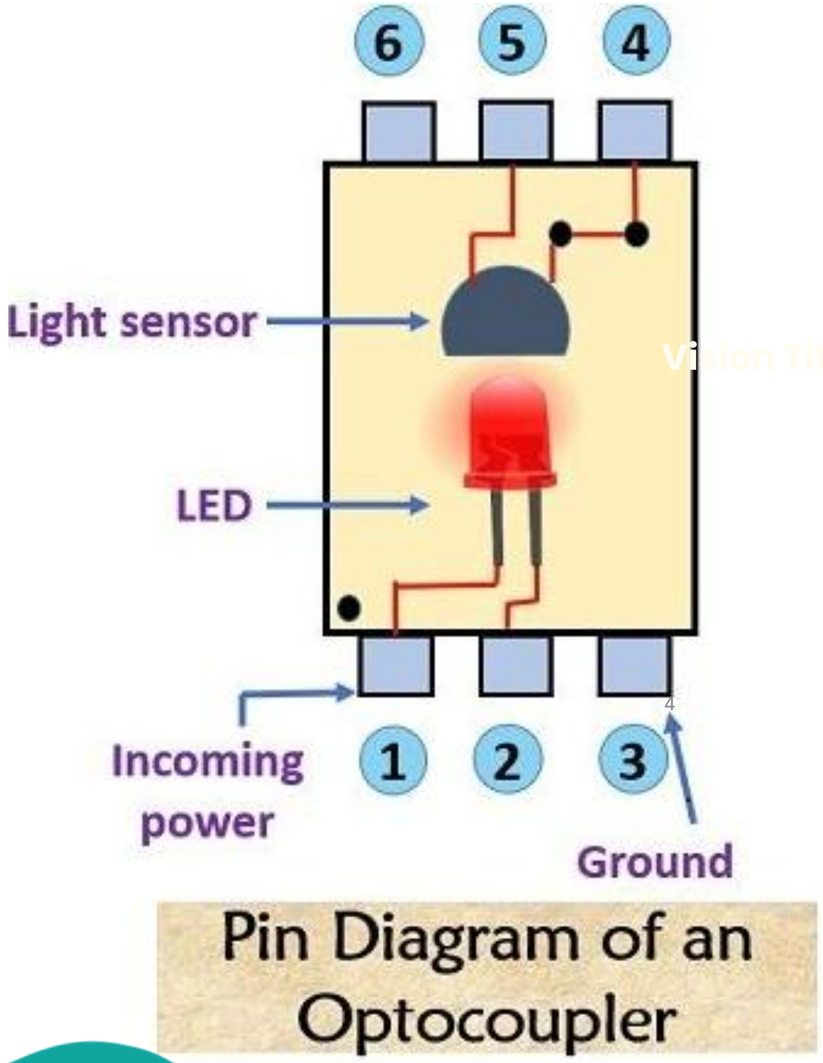
- An optocoupler or optoelectronic coupler is an electronic component that basically acts as an interface between the two separate circuits with different voltage levels.
- Optocouplers are common component by which electrical isolation can be supplied between the input and output source.
- It is a 6 pin device and can have any number of photodetectors.
- In high voltage applications where the voltage difference between the two circuits differs by several thousand volts, such isolation is favourable.
- Isolated circuits are the circuits which do not have a common conductor in between them and proper isolation is maintained.

Construction of Optocouplers



- An optocoupler mainly consists of an infrared LED and a photosensitive device that detects the emitted infrared beam.
- The semiconductor photosensitive device can be a photodiode, phototransistor, a Darlington pair etc.
- The LED is kept on the input side and the light-sensitive material is placed on the output side. A resistance is connected at the beginning of the circuit which is used to limit the current.

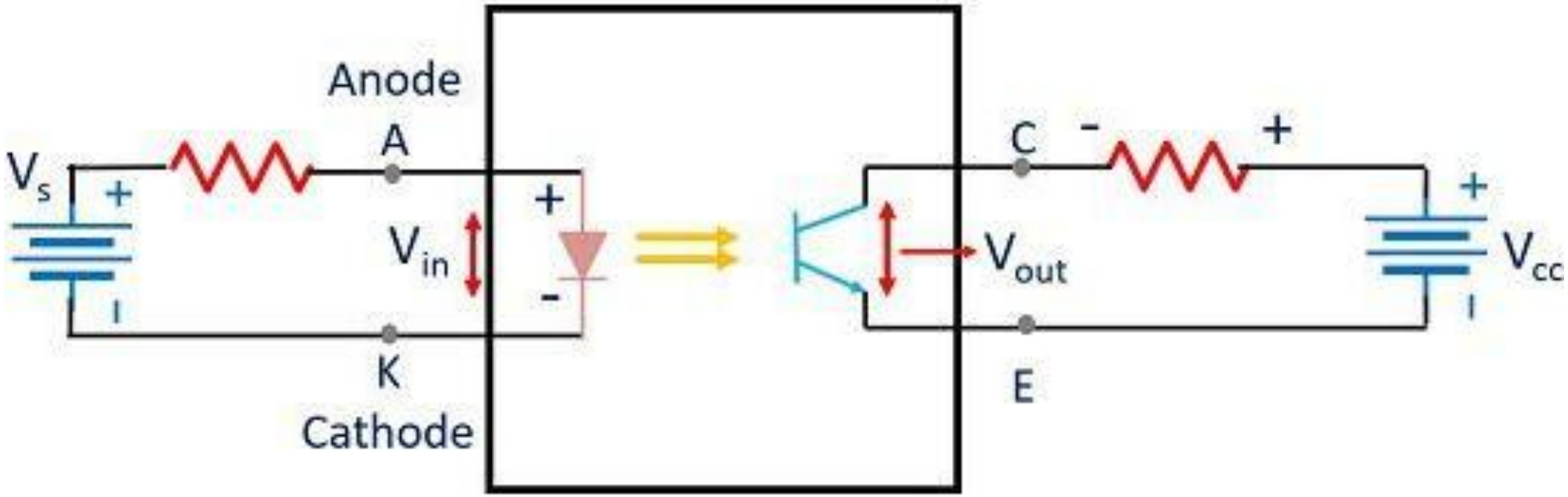
Pin Diagram of Optocoupler



Pin Diagram of an Optocoupler

- Pin 1: Anode
- Pin 2: Cathode
- Pin 3: Ground
- Pin 4: Emitter
- Pin 5: Collector
- Pin 6: Base

Working of a Optocoupler



LED Driving a Phototransistor

Advantages & Disadvantages

Advantages	Disadvantages
Optocouplers allow easy interfacing with logic circuits.	The operational speed of Optocouplers is low.
Electrical isolation provides circuit protection.	In case of a very high power signal, the possibility of signal coupling may arise.
It allows wideband signal transmission.	
It is small in size and lightweight device	

Applications

1.It is used in high power inverters.

2.It is used in high power choppers.

3.In AC to DC converters optocouplers are widely used.