



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++'(III Cycle) Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

23ECB101 – CIRCUIT ANALYSIS AND DEVICES

I YEAR/ II SEMESTER

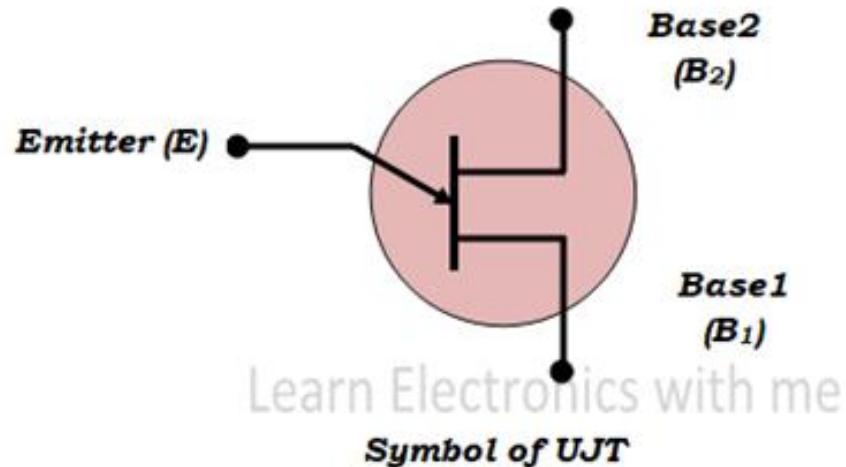
UNIT 4 – SEMICONDUCTOR DIODES AND THEIR APPLICATIONS

TOPIC - Unijunction Transistor



Unijunction Transistor

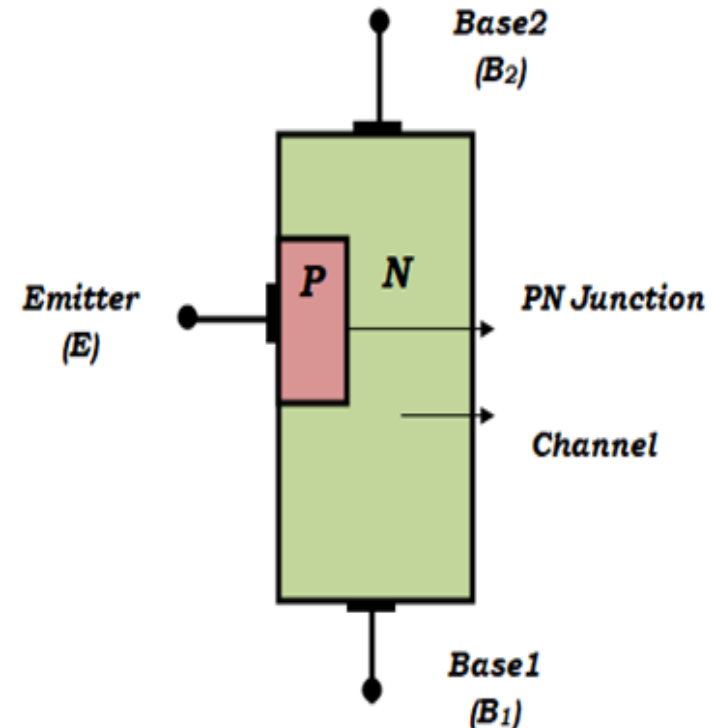
Unijunction Transistor (UJT) is a three terminal semiconductor device.





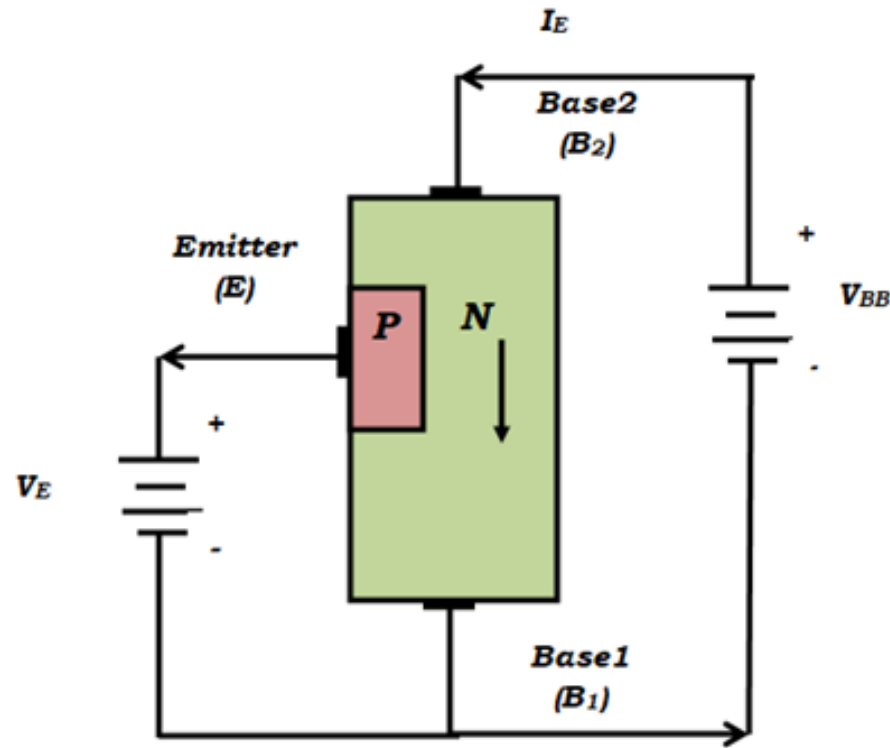
Construction of UJT

The channel is formed of N type which is lightly doped and P type material is infused on it and the doping concentration of P type is very high. Thus it forms single PN junction and this is the reason for the name Unijunction. The terminals Base2 (B2), Base1 (B1) are taken from the N channel through the Ohmic contacts and Emitter taken from the heavily doped P type material. The Emitter terminal is closer to the Base2 terminal than the Base1 terminal.





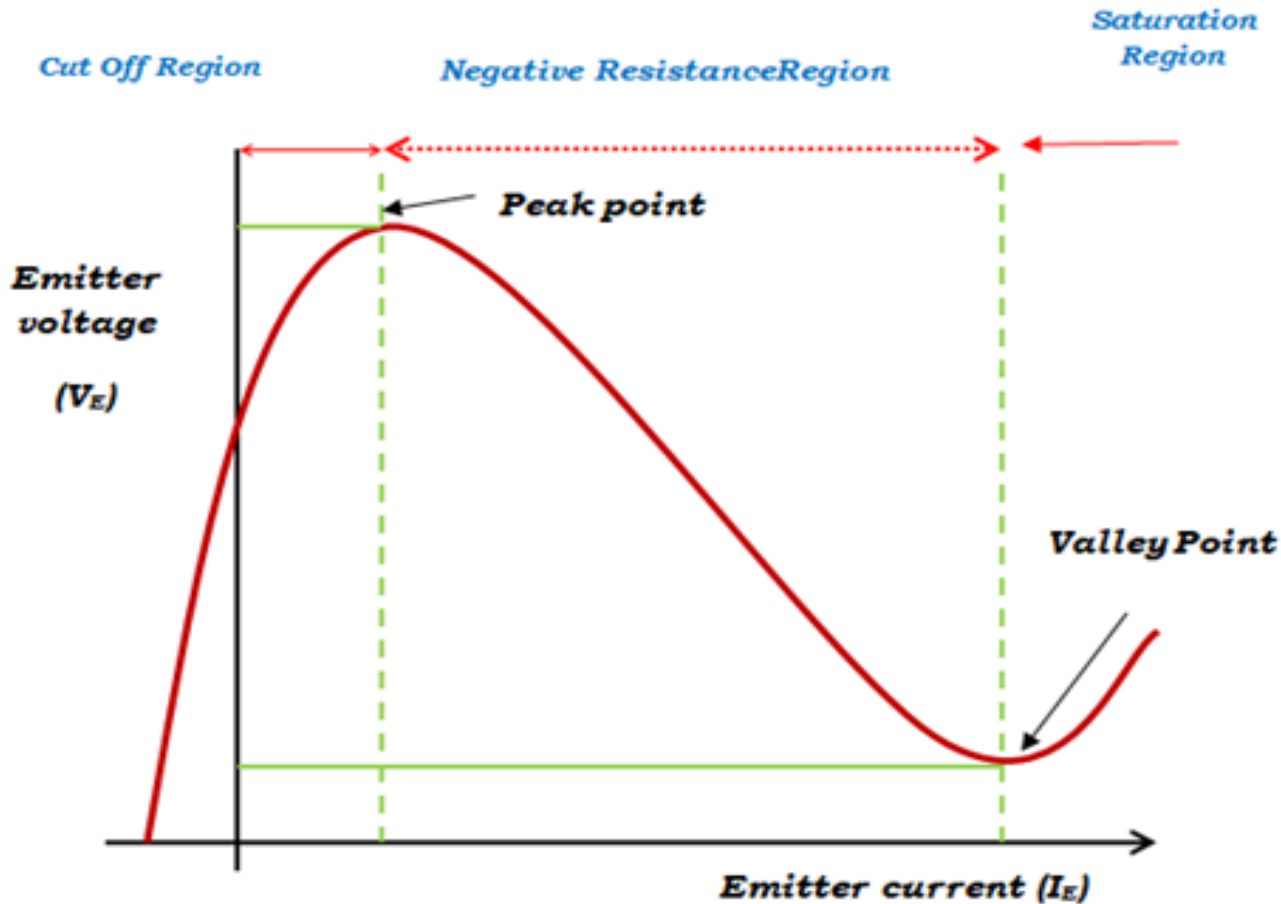
Working of UJT



Working of UJT



Characteristics of UJT



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Characteristics of UJT



Cut off Region:

In this region the applied input voltage is not sufficient to turn the device ON and the applied voltage didn't reach the triggering voltage.

Negative Resistance Region:

After the applied voltage reach the triggering voltage the device is turned ON and the emitter voltage reaches the peak voltage and it drops to valley point, even though the emitter current increases.

Saturation Region:

In this region when the applied voltage increases, the emitter voltage and the emitter current increase gradually.



Advantages

- Low cost and low power absorbing device
- UJT is good at blocking the reverse current
- Stable triggering voltage
- It provides very good switching response

Disadvantages

- It cannot be used for high frequency.
- Because of its negative impedance property, it cannot be used in all circuits.
- It does not provide amplification.



Application of Unijunction Transistor



- Used in timing circuits
- Used as switching device
- Used as oscillators
- Used for phase control
- Used in sawtooth generators



Assessment Questions



1. How many terminals are there in a unijunction transistor?

- a) 1
- b) 2
- c) 3**
- d) 4

2. What are unijunction transistors used for?

- a) Amplifying a circuit
- b) Circuit breaker
- c) Splitting device
- d) On-Off switching device**

3. Which type of material is the channel of a unijunction transistor made up of?

- a) PN type
- b) It doesn't affect the working
- c) P type
- d) N type**

