



# **SNS COLLEGE OF TECHNOLOGY**

**(An Autonomous Institution)**



**COIMBATORE-35**

**Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai**

**DEPARTMENT OF BIOMEDICAL ENGINEERING**

**COURSE NAME: 19EIB201/ ELECTRONIC DEVICES**

**II YEAR / III SEMESTER**

**Unit 1 – Transistors**

**Topic 2: UJT**

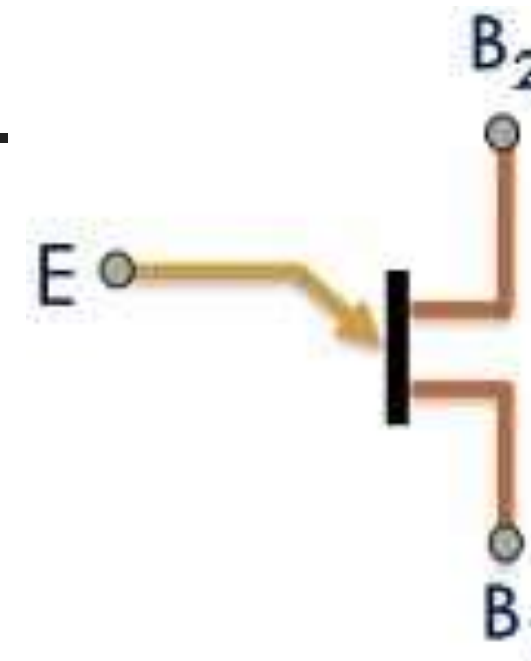




# UNI JUNCTION TRANSISTOR

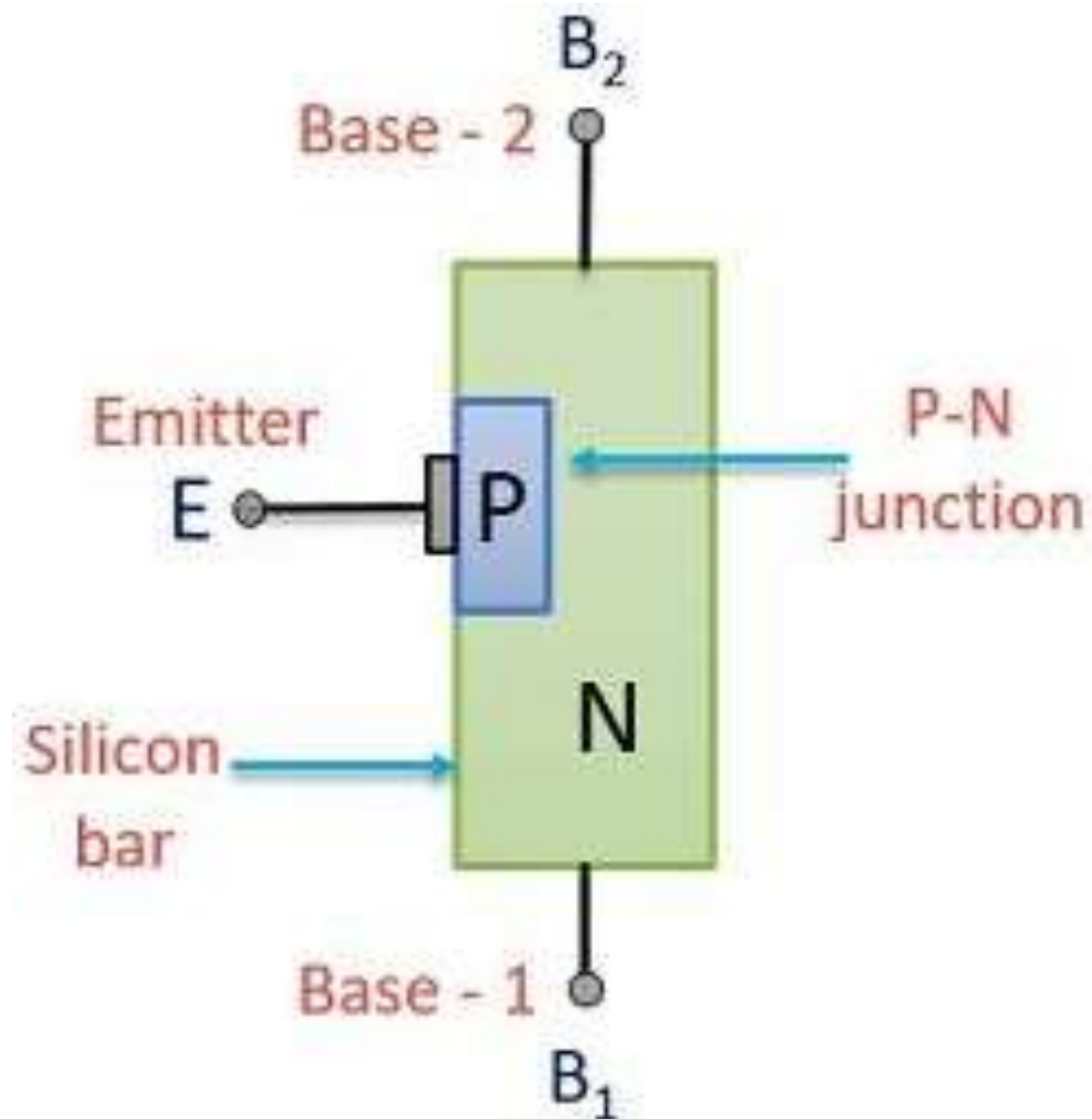


- Unijunction Transistor is a semiconductor switching device having 2 layers and 3 terminals and is abbreviated as UJT.
- It is called so because of the presence of only one junction.
- It has the ability to limit large power with a small input signal and is also known as a **double base diode**.
- UJT is a device that possesses negative resistance characteristic that means its emitter current rises regeneratively when triggered. Thus an emitter supply is needed in order to restrict it.





# Construction of UJT



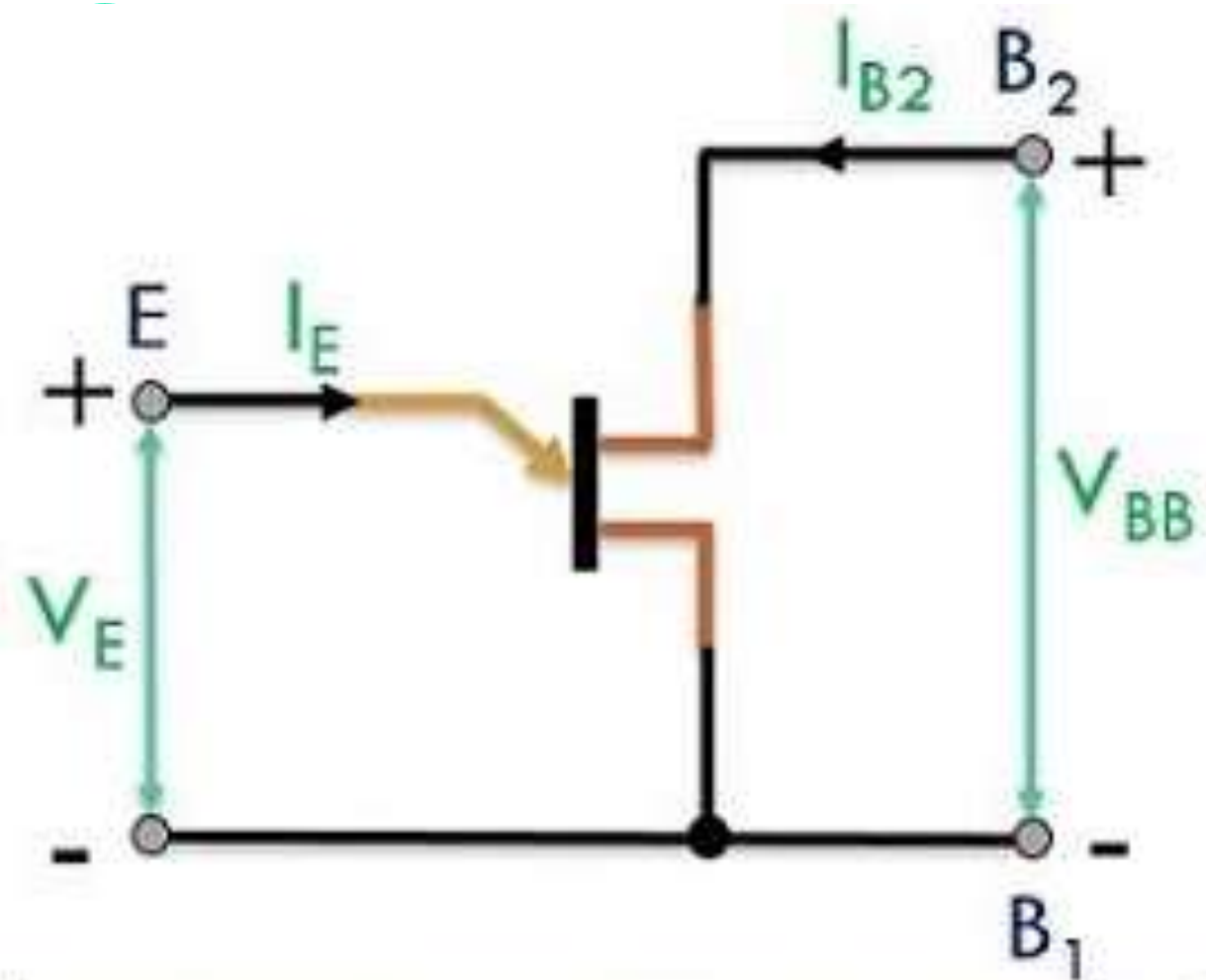
Basic structure of UJT

- Its structure is almost similar to an N-channel JFET. UJT consists of a lightly doped N-type silicon bar in which a P-type material is diffused thus producing PN junction.
- Due to the existence of a single PN junction, it is termed as a Unijunction device.
- It consists of two ohmic contacts at the end of the bar which is labelled as base 1 (B1) and base 2 (B2).
- Emitter region is closer to B2 in order to have the optimum electrical characteristic.

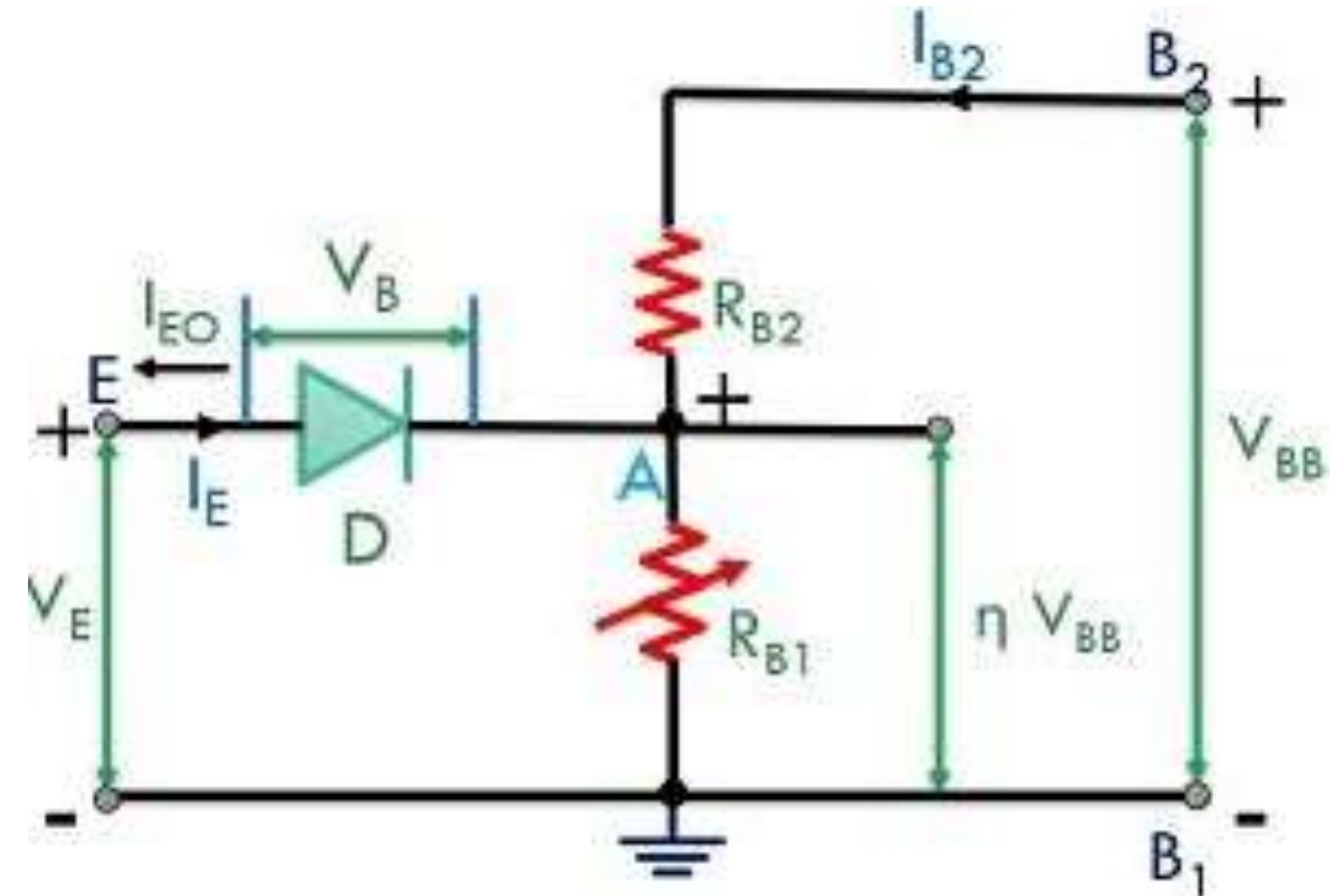




# Basic arrangement of a UJT



Basic UJT arrangement



Equivalent circuit of UJT



# Working of a UJT

- The two resistor of the circuit together constitutes the total resistance which is the resistance between B2 and B1 where the emitter is kept open is known as **Interbase resistance  $R_{BB}$** .

$$R_{BB} = R_{B1} + R_{B2}$$

- Normally the value of RB1 is greater than that of RB2.

$$V_A = V_{BB} \times \frac{R_{B1}}{R_{B1} + R_{B2}}$$

$$V_A = \eta V_{BB}, \quad \text{where } \eta \text{ is the intrinsic standoff ratio}$$



# Working of a UJT

- Consider a condition when there is no emitter potential supplied to the circuit. In such a case the diode gets reverse biased.

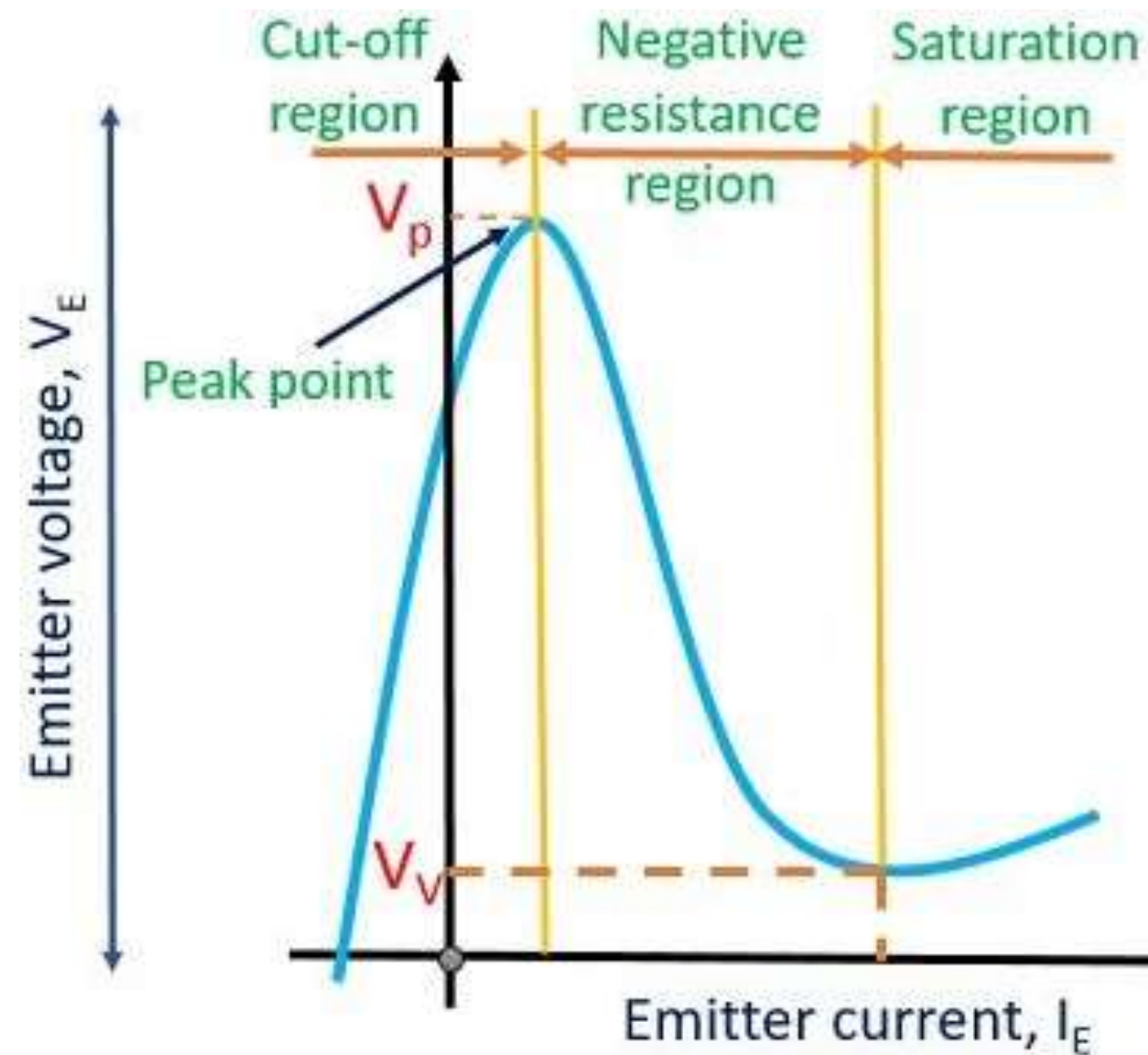
$$V_A + V_B = \eta V_{BB} + V_B$$

- On proceeding further, if the emitter potential is increased more, the diode will now get forward biased. The emitter potential that puts the diode in forward biased condition is known as **peak point voltage** and is denoted by  $V_p$ .
- The minimum value of  $I_E$  to trigger the device is known as **peak point current** of the emitter terminal denoted by  $I_p$ .





# Characteristics of Unijunction transistor



Emitter characteristic of UJT



# SUMMARY





# ASSESSMENT

---

Dear student,

Quiz is posted in your Google class room

Allotted time for quiz is 5 min

No of Questions is 10





KEEP  
LEARNING..  
**Thank u**

SEE YOU IN NEXT CLASS