



# SNS COLLEGE OF TECHNOLOGY

Coimbatore-35  
An Autonomous Institution

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



## DEPARTMENT OF MECHATRONICS

### **16 MC302 – INDUSTRIAL ELECTRONICS & APPLICATION** *III YEAR V SEM*

#### *UNIT 1 – INTRODUCTION TO POWER ELECTRONICS*

#### *TOPIC –BJT*

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## BJT-History





## BJT-History

# TRANSISTOR



VACUUM TUBE COMPUTER - 1940s



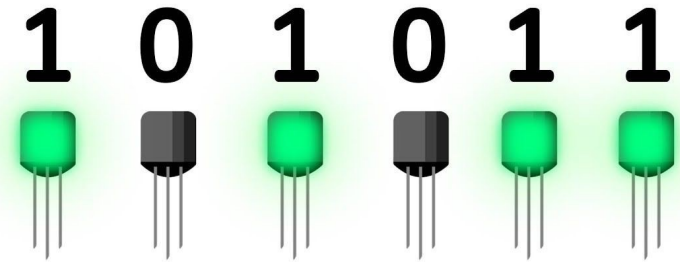
TODAY'S COMPUTER



## BJT-History

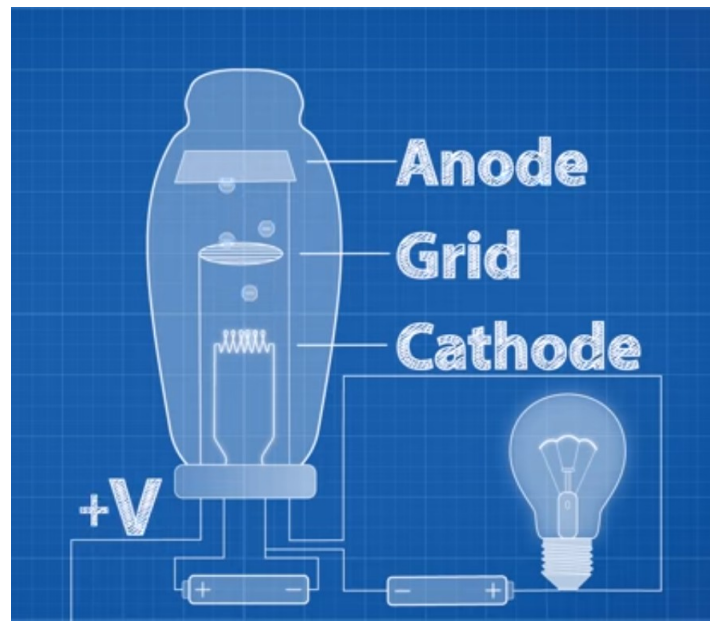
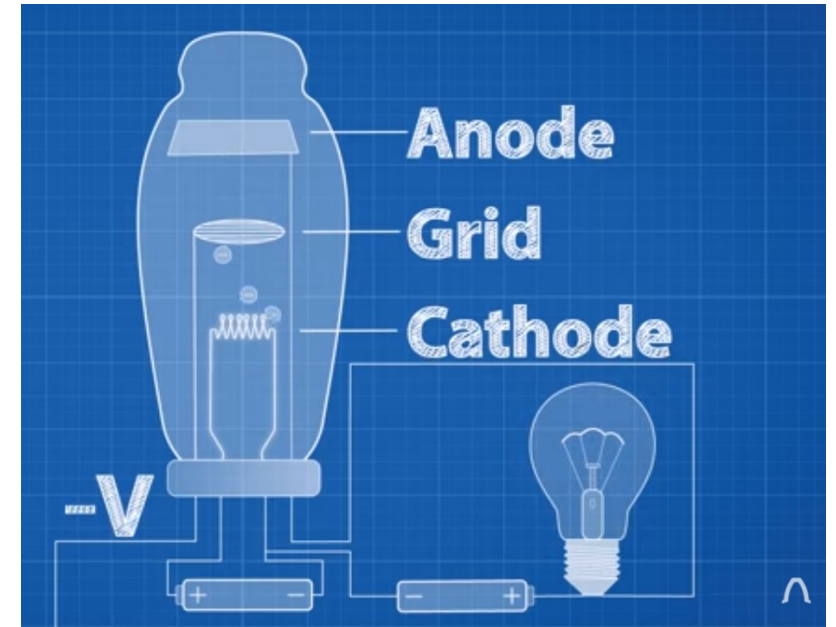
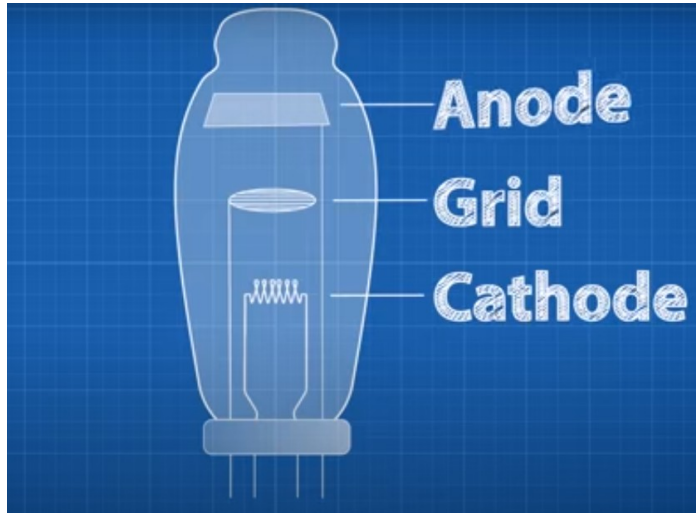


# Binary!



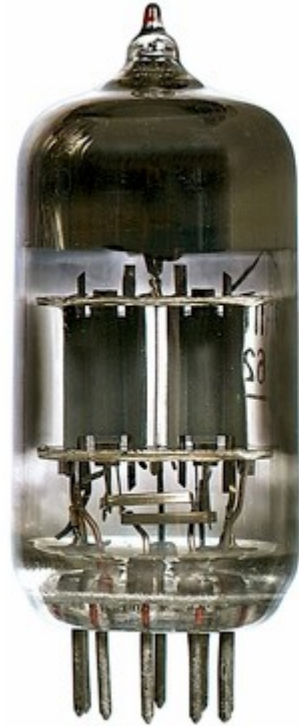


## BJT-History

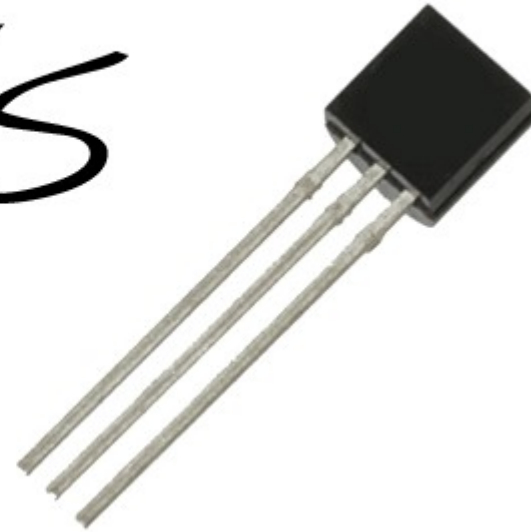




# Vacuum tube to BJT

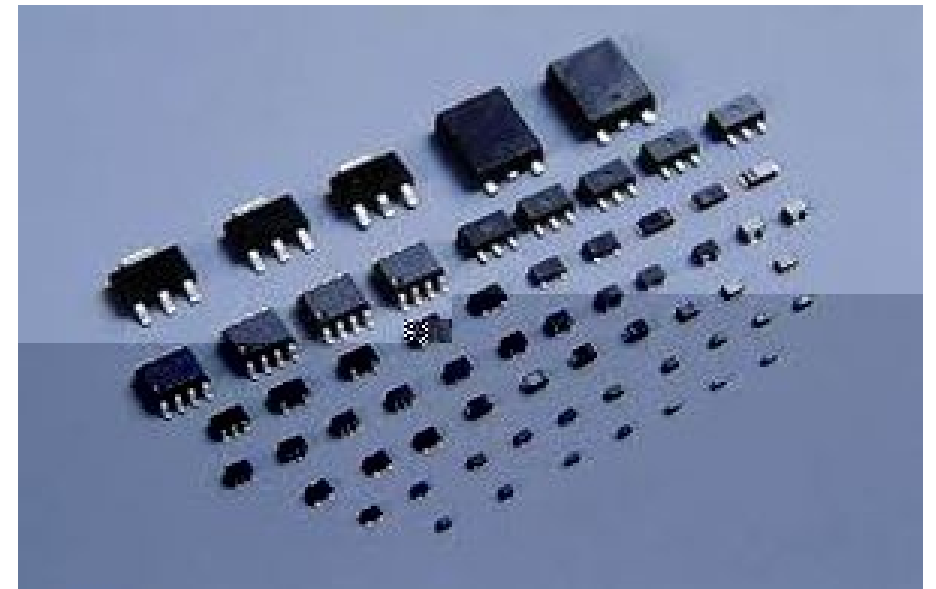
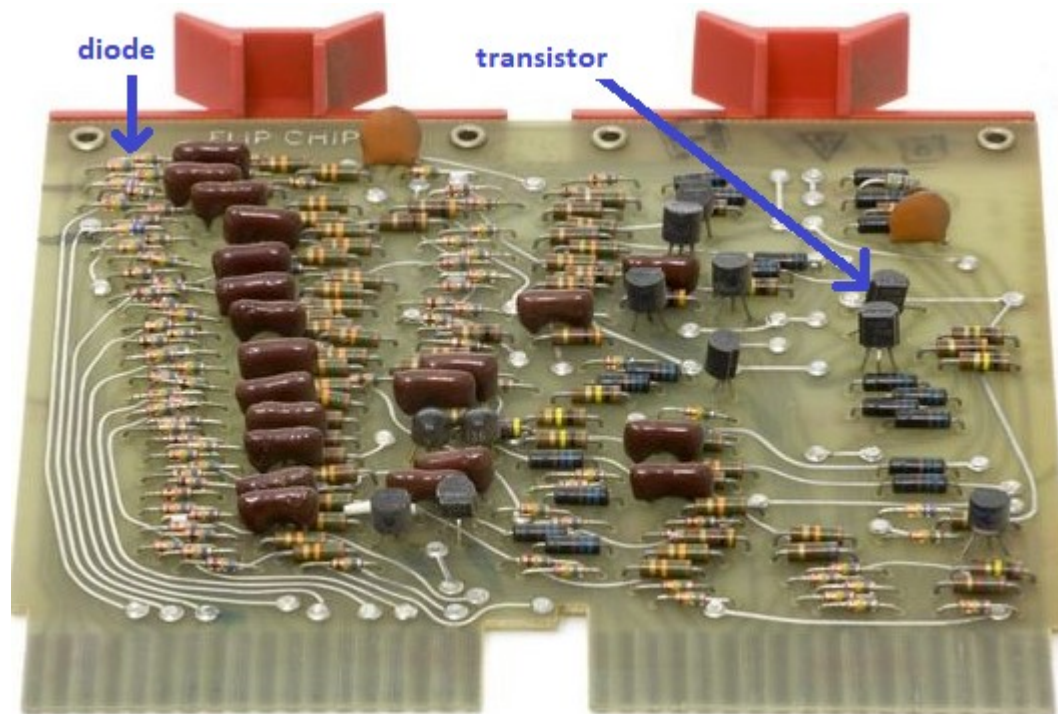


VS





## BJT-History





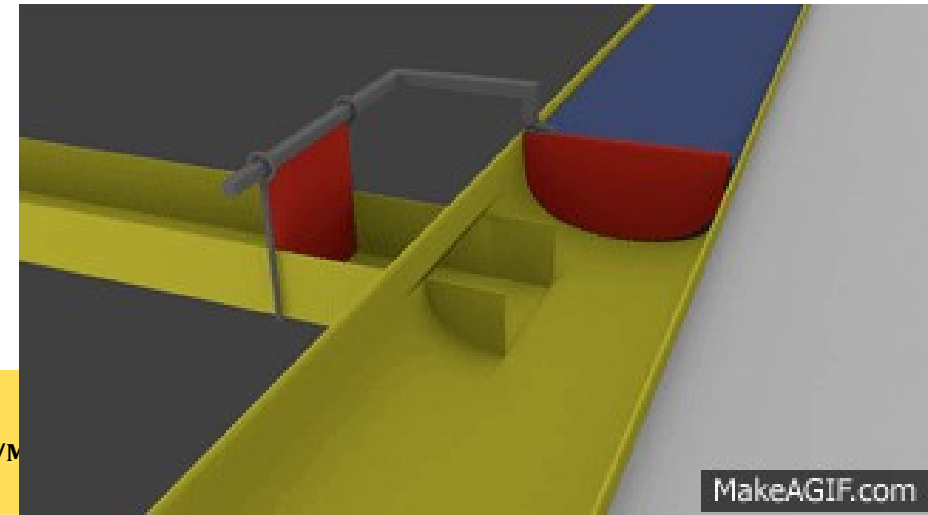
## BJT

A **transistor** is a semiconductor device used to amplify or switch ***electronic signals*** and ***electrical power***.

3 Terminal Device

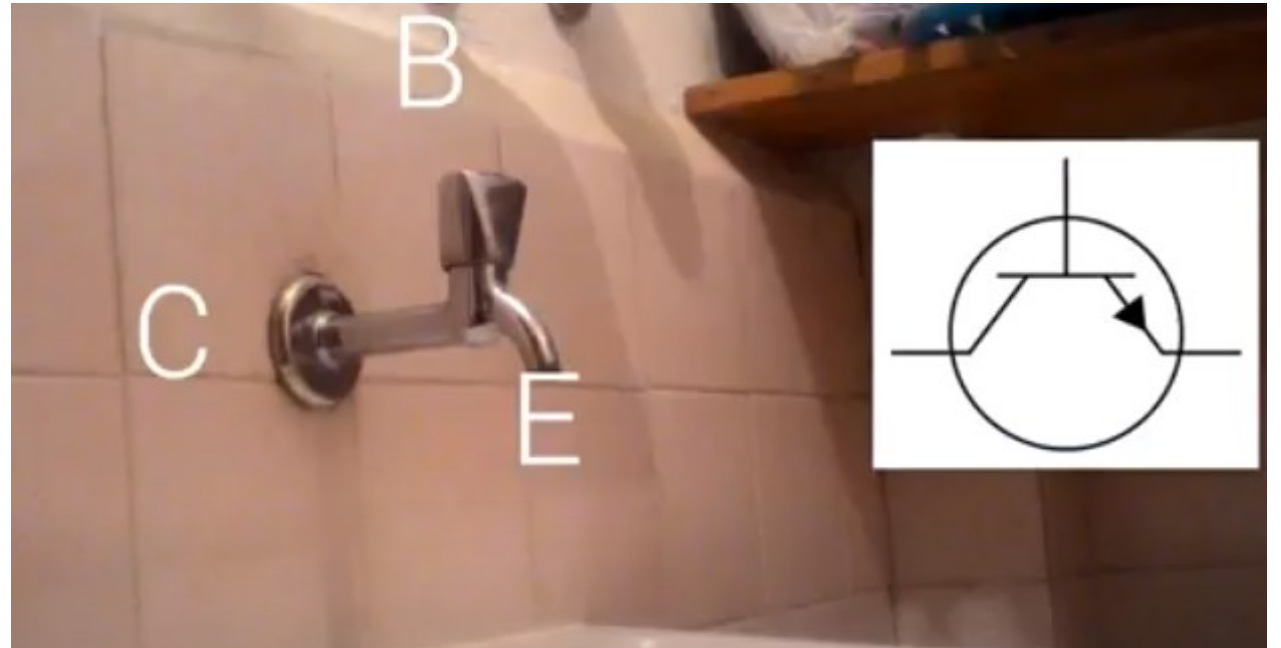
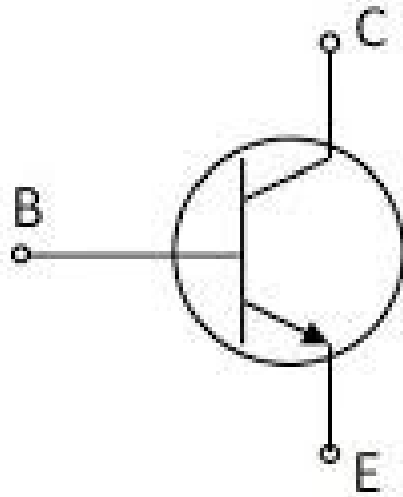
3 layer Device

2 Junction Device



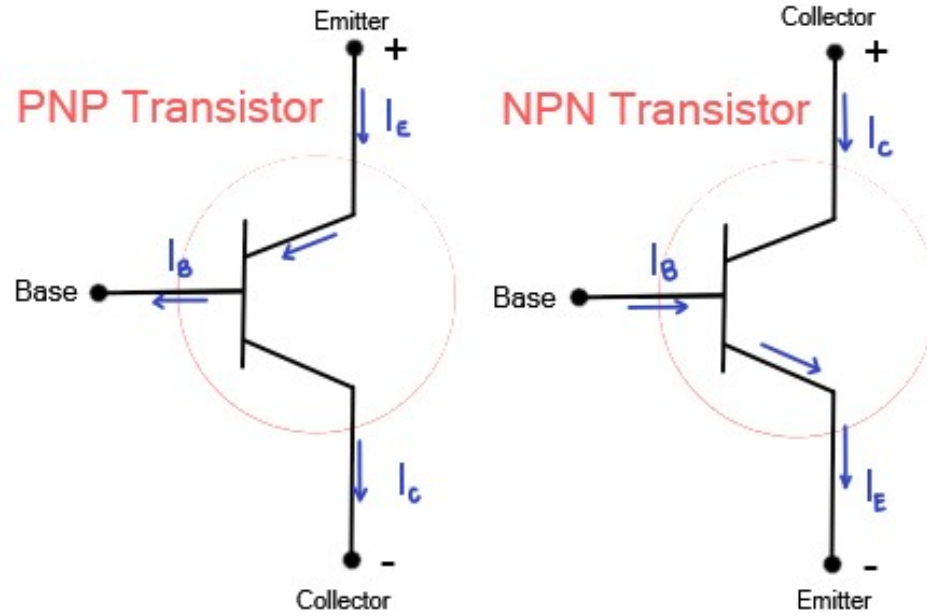


## BJT- Basics

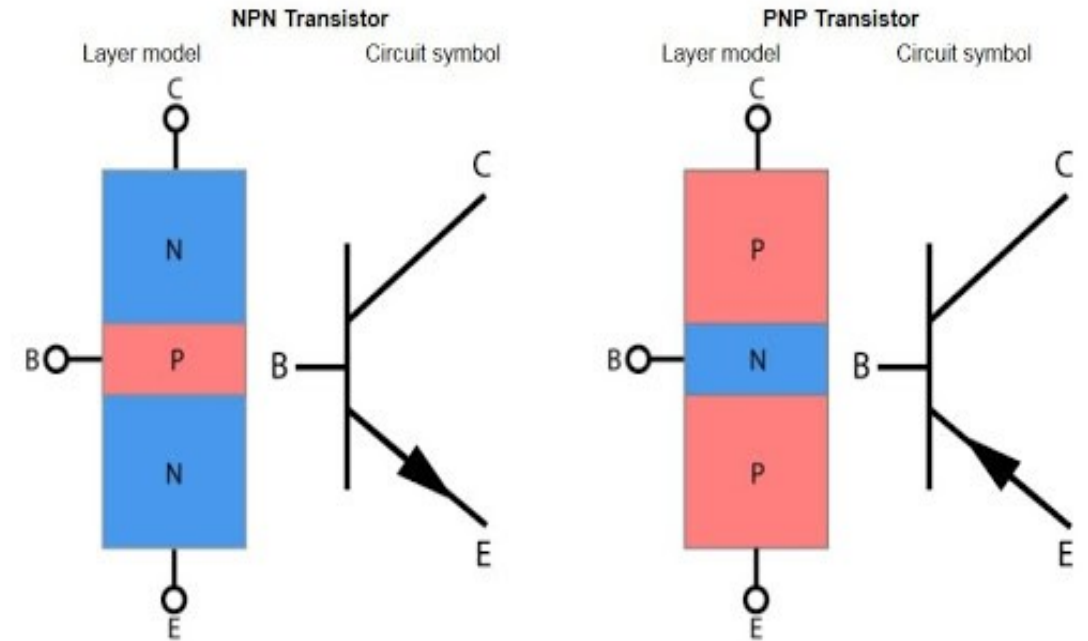




## SYMBOL

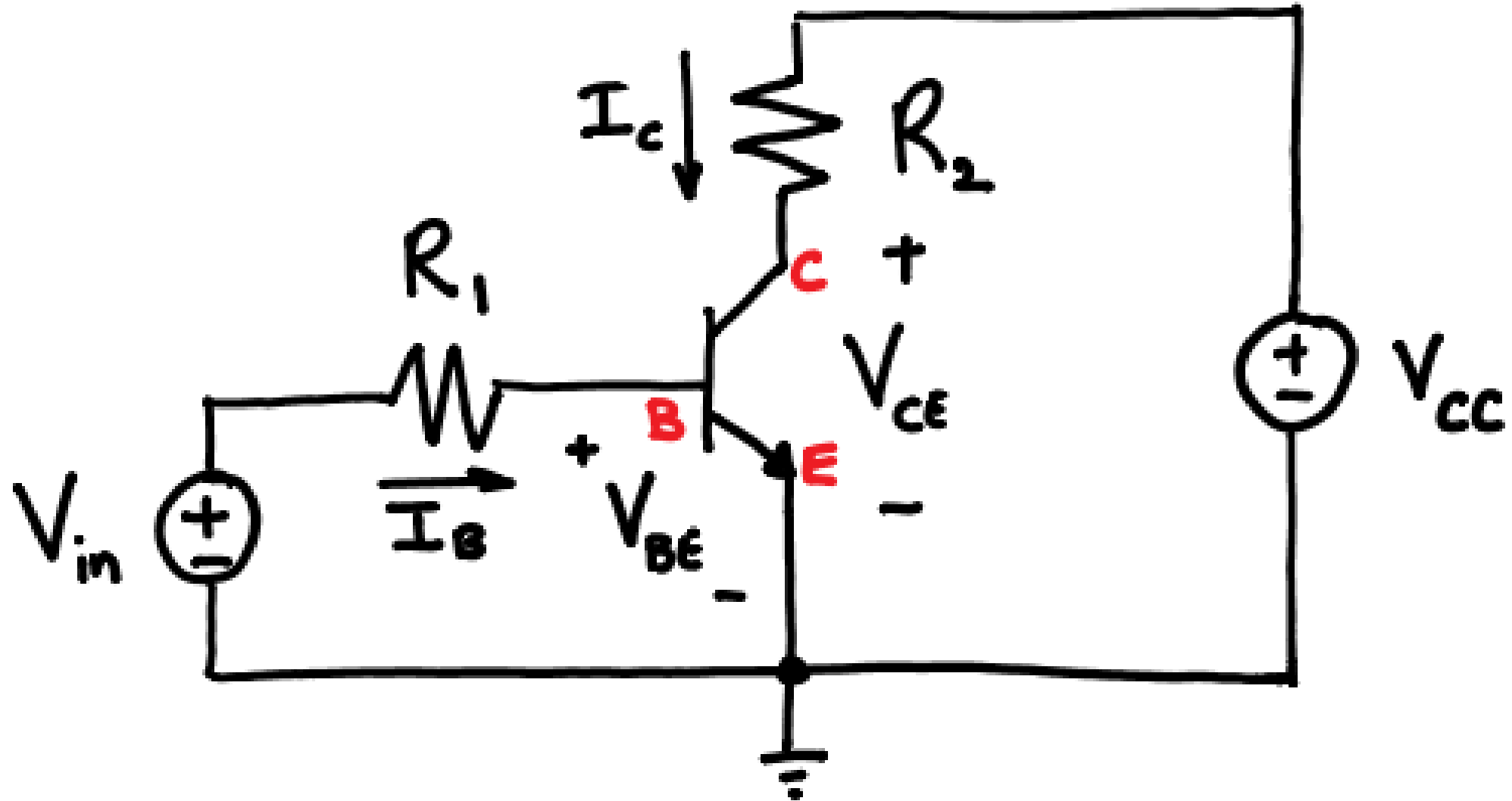


## Layer



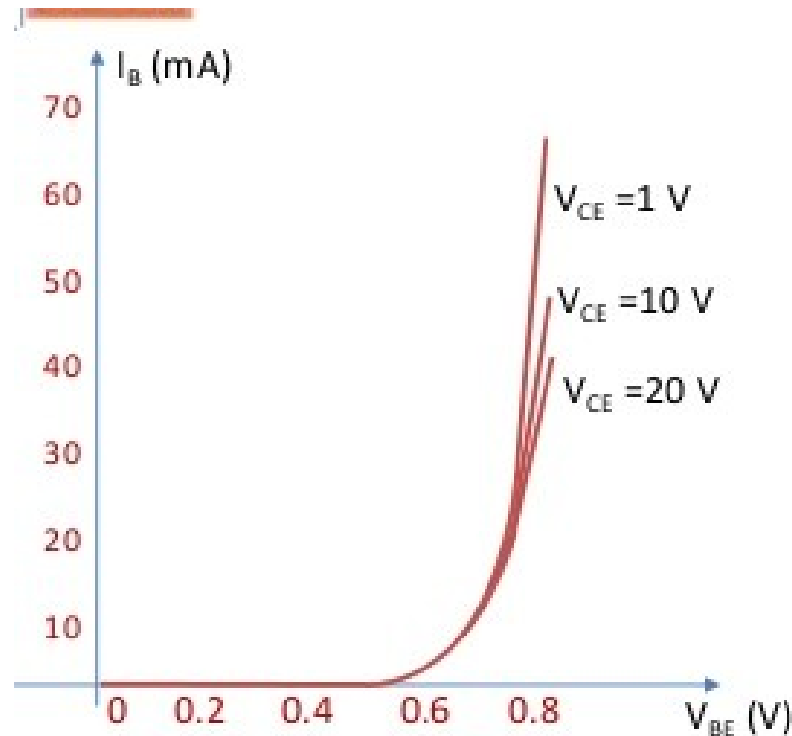


## CIRCUIT DIAGRAM

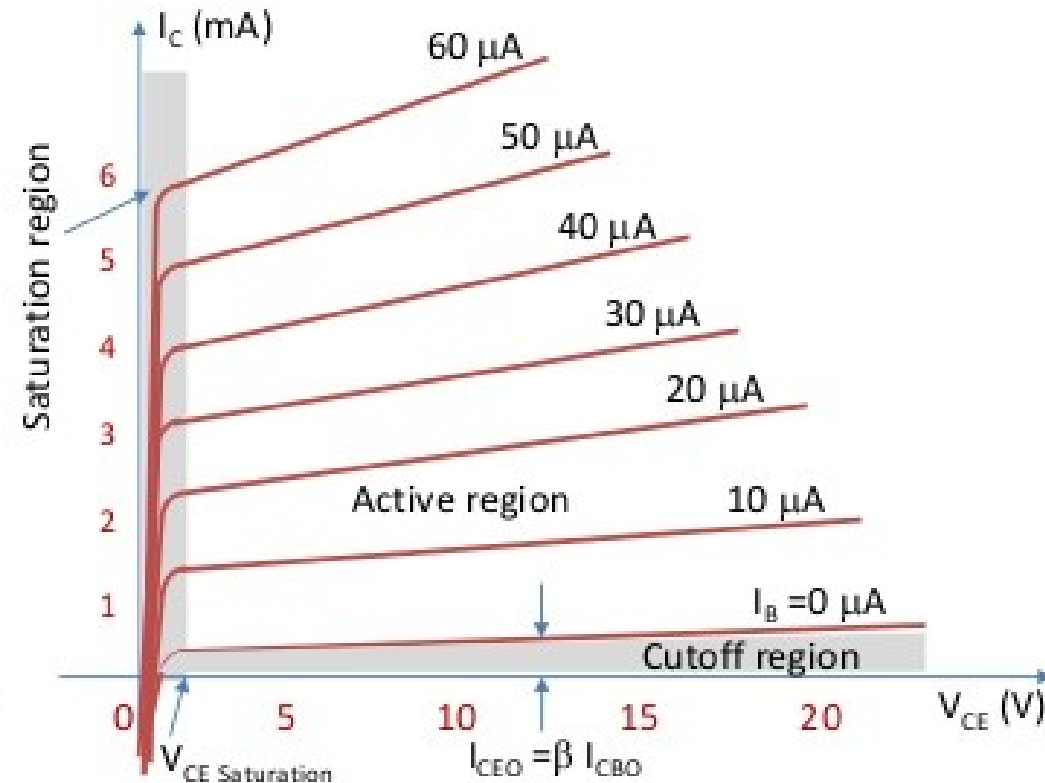




## CHARACTERISTIC DIAGRAM



Input characteristics of CE configuration



Output characteristics of CE configuration



## Advantages of Transistor:

- Lower cost and smaller in size, especially in small-signal circuits.
- Low operating voltages for greater safety, lower costs.
- Extremely long life.
- No power consumption by a cathode heater.
- Fast switching



# Applications

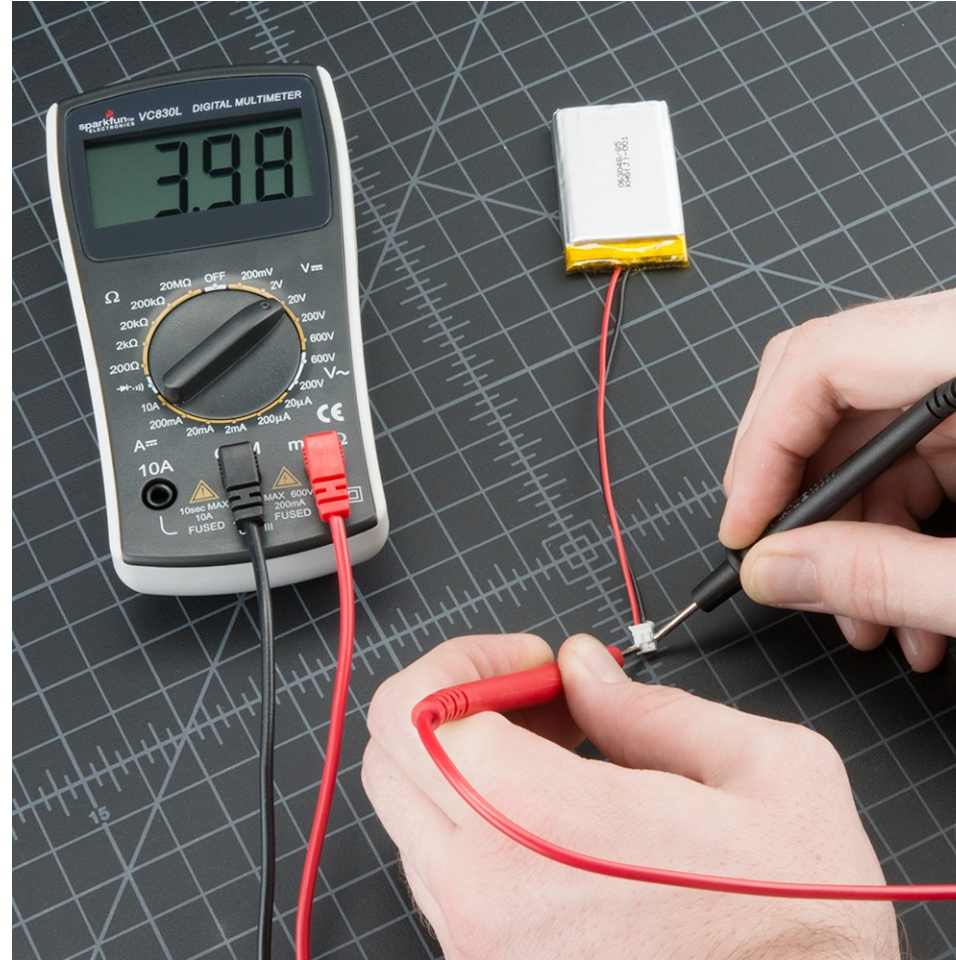
- Daily Life Applications
  - Smart Phones
    - CPU, DSP, Controllers
  - Processors
    - CPU, DSP, Controllers
  - Computers
  - Commercial Electronics
  - Medicine
  - Memory chips
    - RAM, ROM, EEPROM
  - Analog
    - Mobile communication, audio/video processing
  - Programmable
    - PLA, FPGA
  - Embedded systems
    - Used in cars, factories
    - Network cards
  - System-on-chip (SoC)





## ASSIGNMENT

Test a transistor(Both NPN, PNP) with a multimeter.





## References

1. [https://www.electronics-tutorials.ws/transistor/tran\\_1.html](https://www.electronics-tutorials.ws/transistor/tran_1.html)
2. <https://components101.com/articles/understanding-bjt-transistor-and-how-to-use-it-in-your-circuit-designs>
3. <https://www.electrical4u.com/bipolar-junction-transistor-or-bjt-n-p-n-or-p-n-p-transistor/>
4. <https://www.youtube.com/watch?v=-VwPSDQmdjM>
5. <https://www.youtube.com/watch?v=7ukDKVHnac4>

