

<b>Experiment No. 7 c)</b> <b>Date :</b>	<b>CHARACTERISTICS OF BJT (CE CONFIGURATION)</b>
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**Aim**

To plot the transistor (BJT) characteristics of CE configuration.

**Apparatus Required**

S.No.	Name	Range	Qty
1	R.P.S	(0-30)V	2
2	Ammeter	(0-30) mA MC	1
		(0-250) $\mu$ A MC	1
3	Voltmeter	(0-30)V MC	1
		(0-1)V MC	1

**Components Required**

S.No.	Name	Range	Qty
1	Transistor	BC 107	1
2	Resistor	10 K $\Omega$	1
	Resistor	1 K $\Omega$	1
3	Bread Board		1
4	Wires		

**Theory**

A BJT is a three terminal two – junction semiconductor device in which the conduction is due to both the charge carrier. Hence it is a bipolar device. BJT is classified into two types – NPN & PNP. A NPN transistor consists of two N types in between which a layer of P is sandwiched. The transistor consists of three terminal emitter, collector and base. The emitter layer is the source of the charge carriers and it is heavily doped with a moderate cross sectional area. The collector collects the charge carries and hence moderate doping and large cross sectional area. The base region acts a path for the movement of the charge carriers. In order to reduce the recombination of holes and electrons the base region is lightly doped and is of hollow cross sectional area. Normally the transistor operates with the EB (emitter-base) junction forward biased.

## Procedure

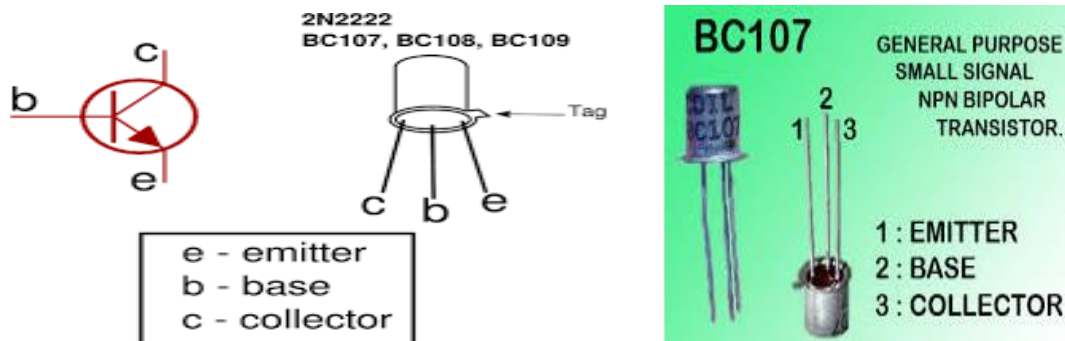
### Input Characteristics

1. Connect the circuit as per the circuit diagram.
2. Set  $V_{CE}$ , vary  $V_{BE}$  in regular interval of steps and note down the corresponding  $I_B$  reading. Repeat the above procedure for different values of  $V_{CE}$ .
3. Plot the graph:  $V_{BE}$  Vs  $I_B$  for a constant  $V_{CE}$ .

### Output Characteristics

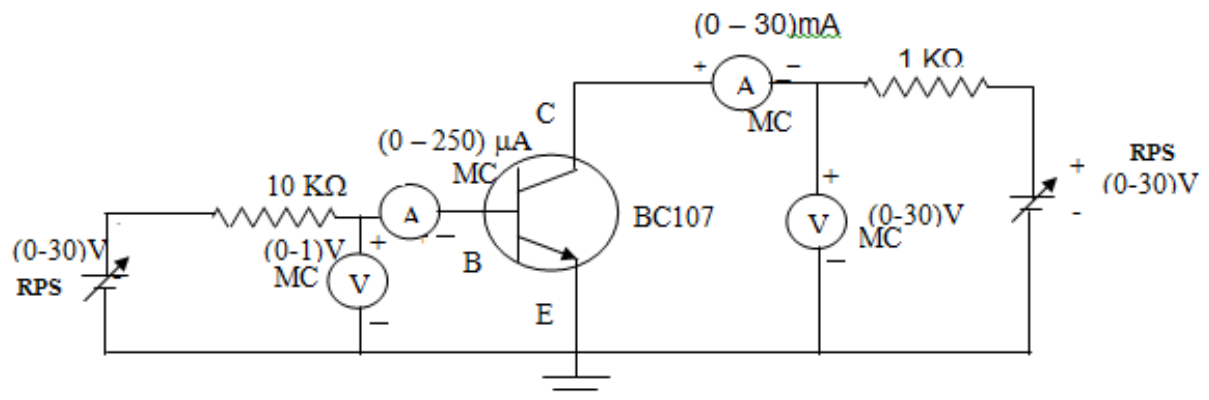
1. Connect the circuit as per the circuit diagram.
2. Set  $I_B$ , Vary  $V_{CE}$  in regular interval of steps and note down the corresponding  $I_C$  reading. Repeat the above procedure for different values of  $I_B$ .
3. Plot the graph:  $V_{CE}$  Vs  $I_C$  for a constant  $I_B$ .

### Pin Diagram



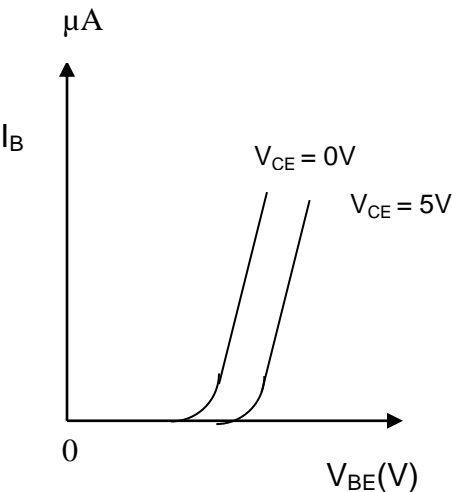
Specification: BC107/50V/0.1A,0.3W,300 MH

### Circuit Diagram

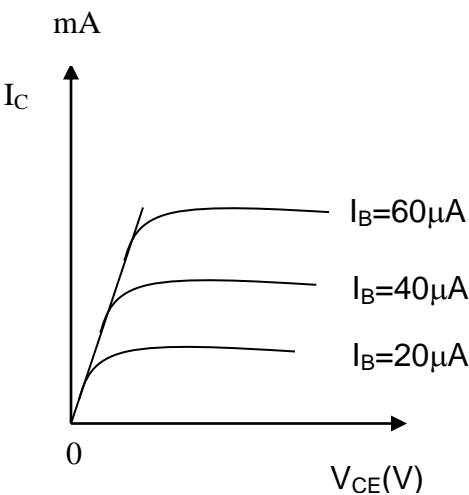


Model Graph

Input Characteristics



Output Characteristics



Tabular Column

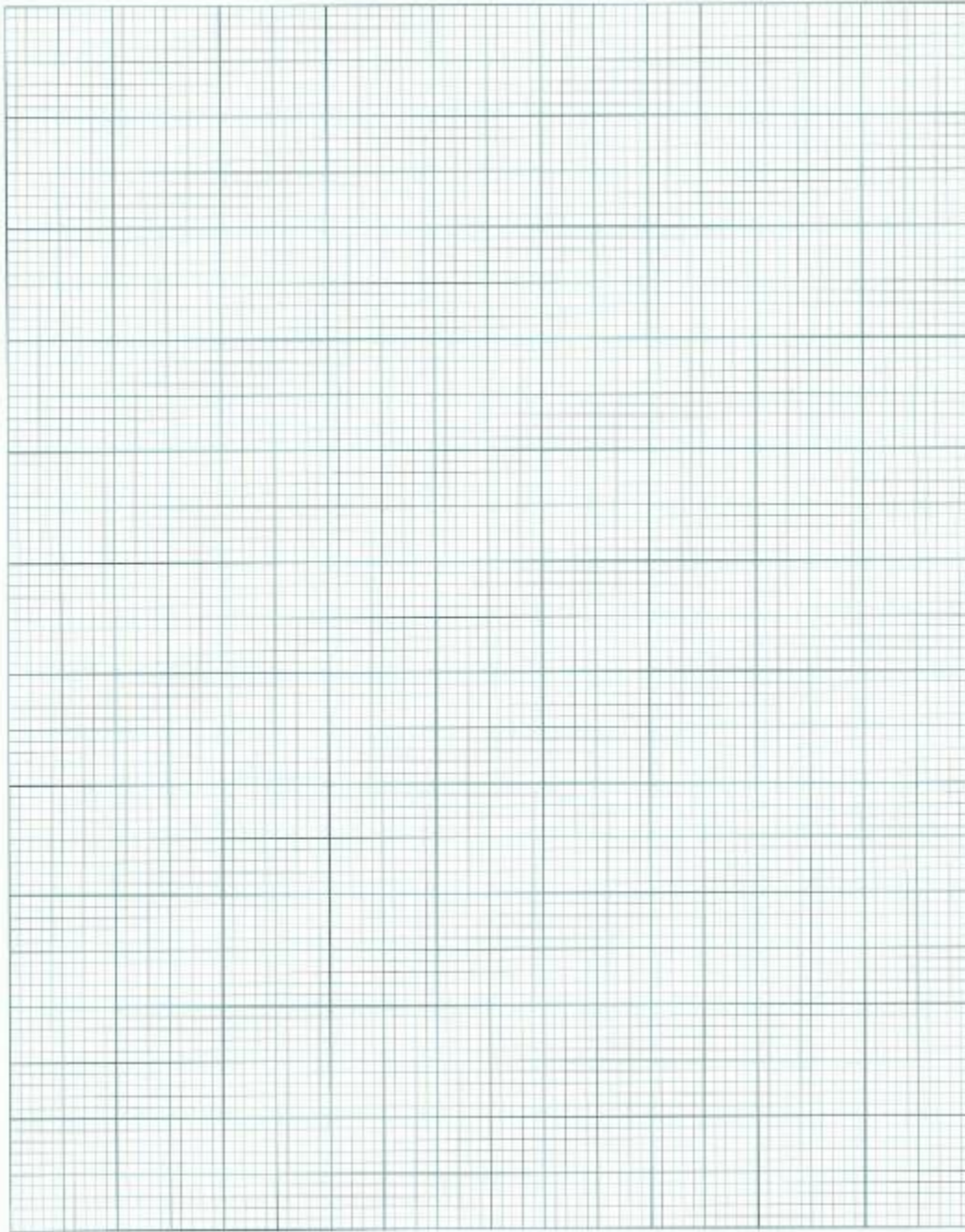
Input Characteristics

$V_{CE} = 0\text{ V}$		$V_{CE} = 2\text{ V}$	
$V_{BE}(V)$	$I_B(\mu A)$	$V_{BE}(V)$	$I_B(\mu A)$

**Output Characteristics**

$I_B=20\mu A$		$I_B=40\mu A$	

**GRAPH:**



**Result**

**POST LAB QUESTIONS**

- 1      What is Punch through voltage?**
  
  
  
  
  
  
  
  
  
  
- 2      What is early effect?**
  
  
  
  
  
  
  
  
  
  
- 3      What are the differences between NPN and PNP transistors?**
  
  
  
  
  
  
  
  
  
  
- 4.      What is leakage current and mention its range?**
  
  
  
  
  
  
  
  
  
  
- 5.      What is base – width modulation?**