

MP309

Experiment 3

BJT Common Base
Characteristics

Patel Mihir Hemantkumar

I18PH037

**Part 2 :- BJT CB Output
Characteristics**

EXPERIMENTAL TABLE		
Serial No.	Emitter Current 1.0 mA	
	Base-Collector Voltage V	Collector Current mA
1	2.080	0.9764
2	3.080	1.003
3	4.080	1.007
4	5.080	1.007
5	6.080	1.007
6	7.080	1.007
7	8.080	1.007
8	9.080	1.007
9	9.780	1.007

Figure 1: Observation table for $I_E=1\text{mA}$

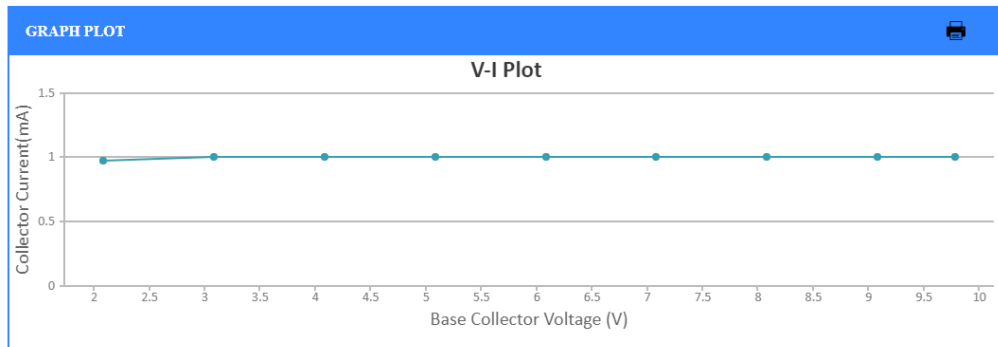


Figure 2: Collector Current (mA) Vs Base-Collector Voltage (V) for $I_E=1\text{mA}$

$$\begin{aligned}
 1. \text{ Output resistance} &= \Delta V_{CB} / \Delta I_C \\
 &= (8.080 - 3.080)V / (1.007 - 1.003) * 10^{-3}A \\
 &= 1250000\Omega
 \end{aligned}$$

$$2. \text{ Average } I_C = 1.003 \text{ mA}$$

$$\begin{aligned}
 3. \text{ Current Gain} &= I_C / I_E \\
 &= 1.0032
 \end{aligned}$$

EXPERIMENTAL TABLE		
Serial No.	Emitter Current 2.0 mA	
	Base-Collector Voltage V	Collector Current mA
1	1.000	1.523
2	2.000	1.928
3	3.000	1.990
4	4.000	1.999
5	5.000	2.000
6	6.000	2.000
7	7.000	2.000
8	8.000	2.000
9	9.000	2.000
10	9.300	2.000

Figure 3: Observation table for $I_E=2\text{mA}$

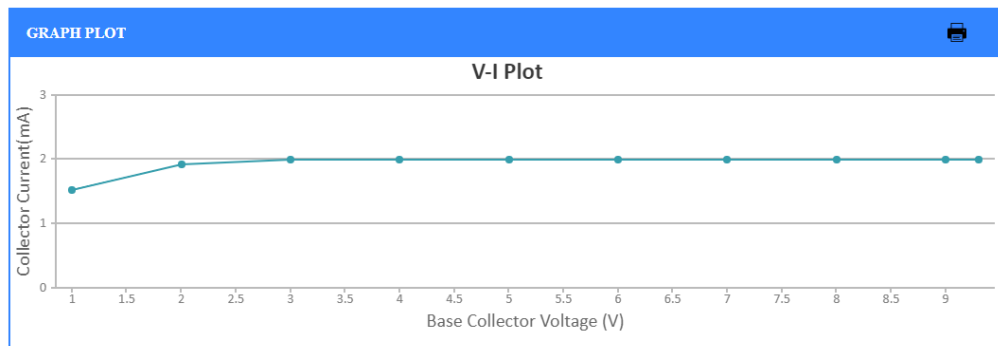


Figure 4: Collector Current (mA) Vs Base-Collector Voltage (V) for $I_E=2\text{mA}$

$$1. \text{ Output resistance} = \Delta V_{CB} / \Delta I_C$$

$$= (8.0 - 3.0)V / (2 - 1.990) * 10^{-3} A$$

$$= 500000\Omega$$

$$2. \text{ Average } I_C = 1.944 \text{ mA}$$

$$3. \text{ Current Gain} = I_C / I_E$$

$$= 1.944 / 2$$

$$= 0.972$$

EXPERIMENTAL TABLE		
Serial No.	Emitter Current 3.0 mA	
	Base-Collector Voltage V	Collector Current mA
1	2.020	2.881
2	3.020	2.970
3	4.020	2.982
4	5.020	2.984
5	6.020	2.984
6	7.020	2.984
7	8.020	2.984
8	9.020	2.984

Figure 5: Observation table for $I_E=3\text{mA}$

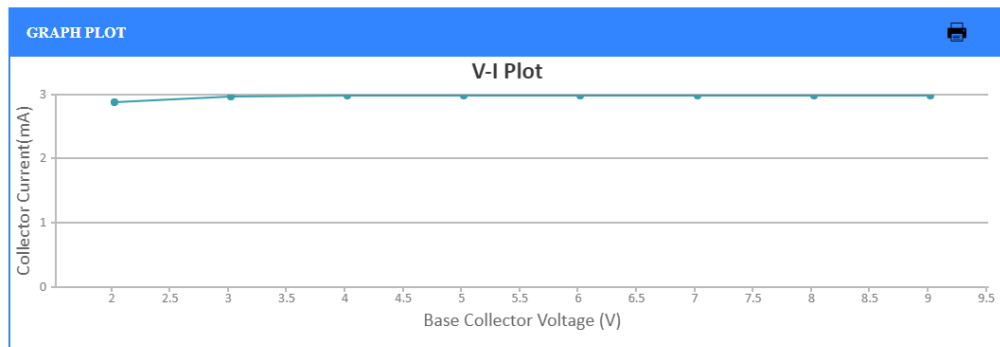


Figure 6: Collector Current (mA) Vs Base-Collector Voltage (V) for $I_E=3\text{mA}$

$$\begin{aligned}
 1. \text{ Output resistance} &= \Delta V_{CB} / \Delta I_C \\
 &= (9.020 - 4.020)V / (2.984 - 2.982) * 10^{-3}A \\
 &= 2500000\Omega
 \end{aligned}$$

$$2. \text{ Average } I_C = 2.969 \text{ mA}$$

$$\begin{aligned}
 3. \text{ Current Gain} &= I_C / I_E \\
 &= 2.969 / 3 \\
 &= 0.989
 \end{aligned}$$