MP309

Experiment 3

BJT Common Base Characteristics

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Part 1 :-BJT CB Input Characteristics

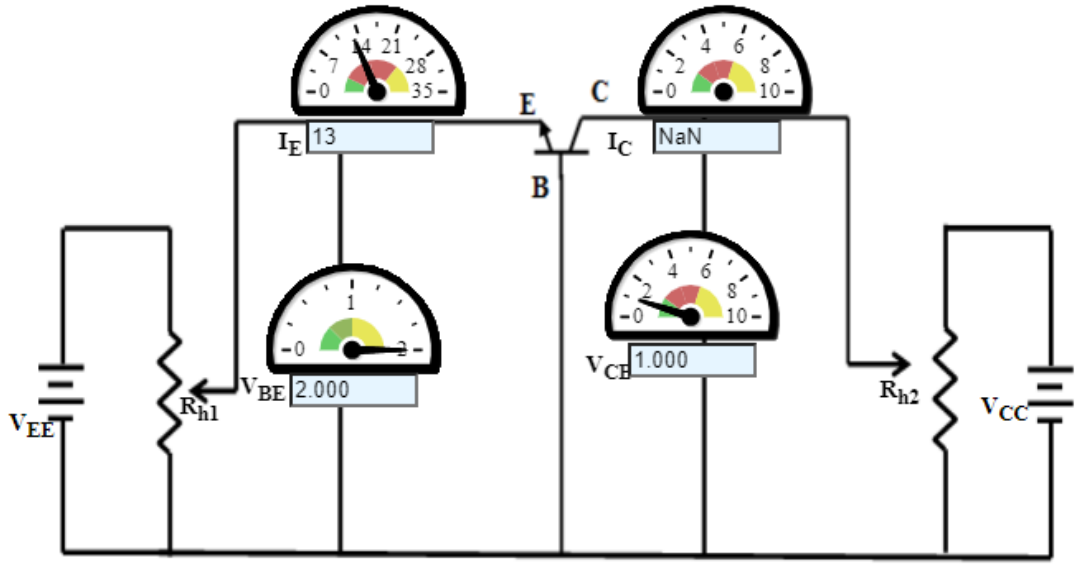

Figure 1: Circuit Diagram

EXPERIMENTAL TABLE

Serial No.	Base-Collector Voltage 1.000 V	
	Base-Emitter Voltage V	Emitter Current mA
1	0.1000	0.85
2	0.2000	0.98
3	0.3000	1.1
4	0.4000	1.3
5	0.5000	1.5
6	0.6000	1.7
7	0.7000	2.0
8	0.8000	2.3
9	0.9000	2.7
10	1.000	3.1
11	1.100	3.5
12	1.200	4.1
13	1.300	4.7
14	1.400	5.4
15	1.500	6.3
16	1.600	7.2
17	1.700	8.3
18	1.800	9.6
19	1.900	11
20	2.000	13

Figure 2: Observation table for V_{BC}=1V

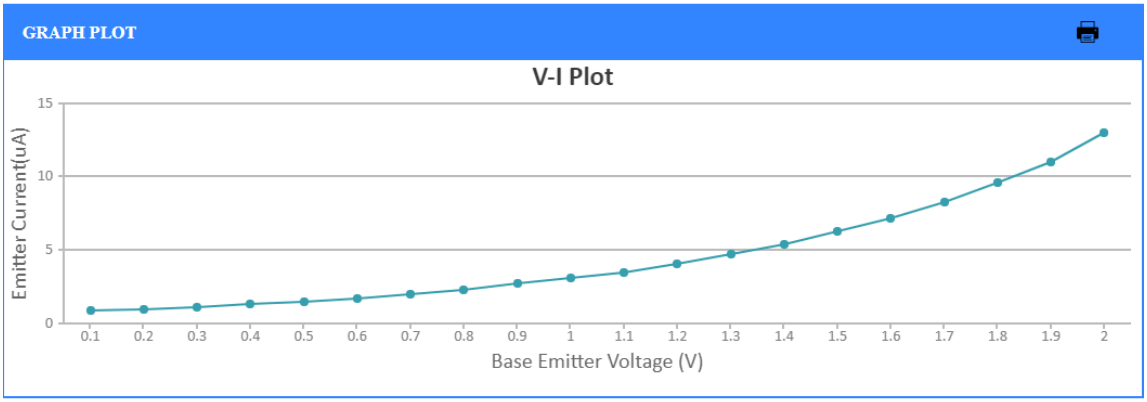

Figure 3: Emitter Current Vs Base-Emitter Voltage for V_{BC}=1V

Input resistance = $\triangle\ V_{BE}\ /\ \triangle\ I_E$

$=(1.2-0.7)V/(4.1-2.0)*10^{-3}A$

$=238.095\Omega$

EXPERIMENTAL TABLE

Serial No.	Base-Collector Voltage 2.000 V	
	Base-Emitter Voltage V	Emitter Current mA
1	0.1000	0.85
2	0.2000	0.98
3	0.3000	1.1
4	0.4000	1.3
5	0.5000	1.5
6	0.6000	1.7
7	0.7000	2.0
8	0.8000	2.3
9	0.9000	2.7
10	1.000	3.1
11	1.100	3.5
12	1.200	4.1
13	1.300	4.7
14	1.400	5.4
15	1.500	6.3
16	1.600	7.2
17	1.700	8.3
18	1.800	9.6
19	1.900	11
20	2.000	13

Figure 4: Observation table for V_{BC}=2V

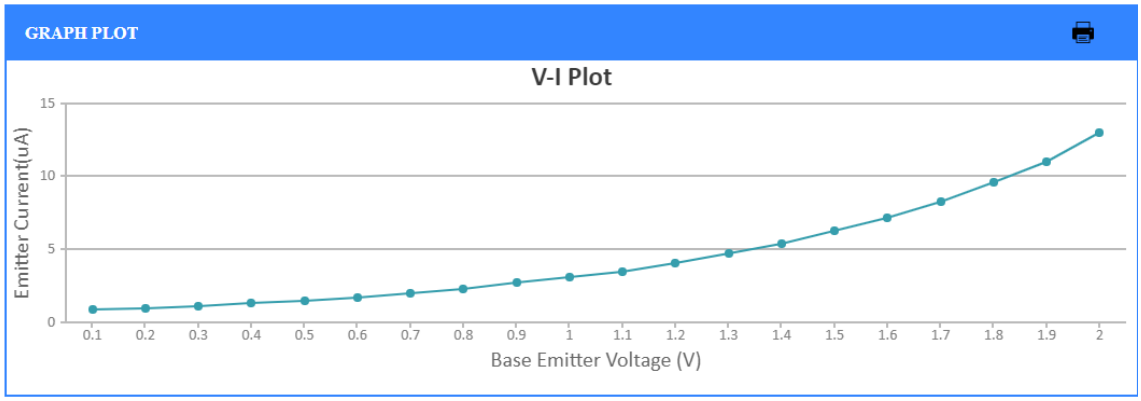

Figure 5: Emitter Current Vs Base-Emitter Voltage for V_{BC}=2V

Input resistance = $\triangle V_{BE}$ / $\triangle I_E$

=$(1.1 - 0.8)V/(3.5 - 2.3) * 10^{-3}A$

= 250Ω

EXPERIMENTAL TABLE

Serial No.	Base-Collector Voltage 3.000 V	
	Base-Emitter Voltage V	Emitter Current mA
1	0.1000	0.85
2	0.2000	0.98
3	0.3000	1.1
4	0.4000	1.3
5	0.5000	1.5
6	0.6000	1.7
7	0.7000	2.0
8	0.8000	2.3
9	0.9000	2.7
10	1.000	3.1
11	1.100	3.5
12	1.200	4.1
13	1.300	4.7
14	1.400	5.4
15	1.500	6.3
16	1.600	7.2
17	1.700	8.3
18	1.800	9.6
19	1.900	11
20	2.000	13

Figure 6: Observation table for V_{BC}=3V

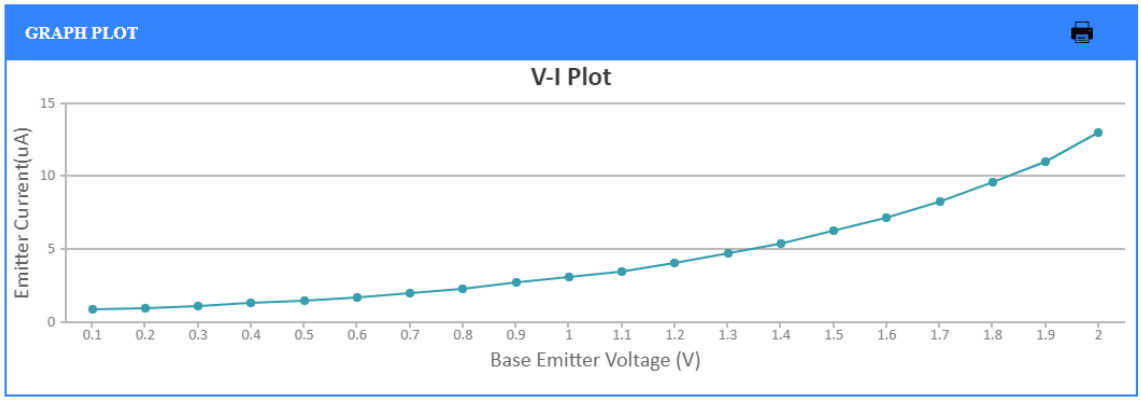

Figure 7: Emitter Current Vs Base-Emitter Voltage for V_{BC}=3V

Input resistance = $\triangle V_{BE}$ / $\triangle I_E$

=$(1.1 - 0.7)V/(3.5 - 2.0) * 10^{-3}A$

= 266.66Ω

EXPERIMENTAL TABLE		
Serial No.	Base-Collector Voltage 4.000 V	
	Base-Emitter Voltage V	Emitter Current mA
1	0.1000	0.85
2	0.2000	0.98
3	0.3000	1.1
4	0.4000	1.3
5	0.5000	1.5
6	0.6000	1.7
7	0.7000	2.0
8	0.8000	2.3
9	0.9000	2.7
10	1.000	3.1
11	1.100	3.5
12	1.200	4.1
13	1.300	4.7
14	1.400	5.4
15	1.500	6.3
16	1.600	7.2
17	1.700	8.3
18	1.800	9.6
19	1.900	11
20	2.000	13

Figure 8: Observation table for V_{BC}=4V

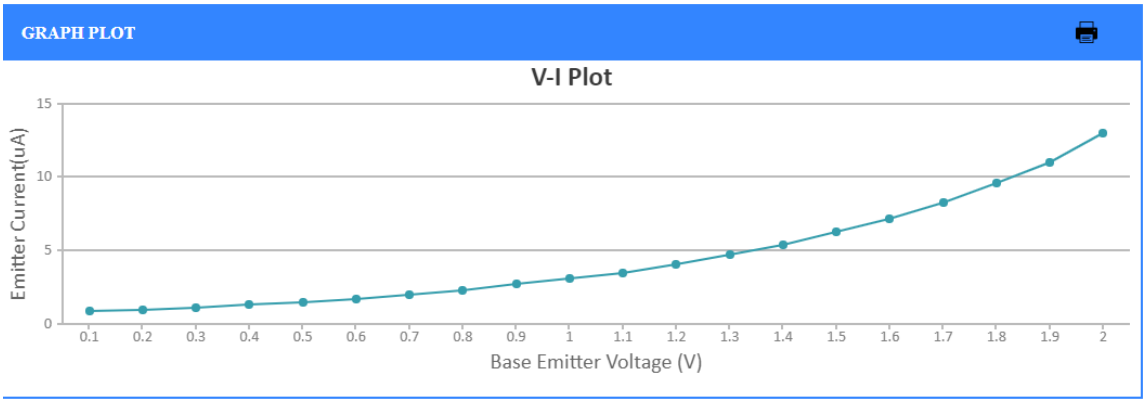

Figure 9: Emitter Current Vs Base-Emitter Voltage for V_{BC}=4V

Input resistance = $\triangle V_{BE}$ / $\triangle I_E$

=$(1.3 - 0.7)V/(4.7 - 2.0) * 10^{-3}A$

= 222.22Ω

EXPERIMENTAL TABLE		
Serial No.	Base-Collector Voltage 5.000 V	
	Base-Emitter Voltage V	Emitter Current mA
1	0.1000	0.85
2	0.2000	0.98
3	0.3000	1.1
4	0.4000	1.3
5	0.5000	1.5
6	0.6000	1.7
7	0.7000	2.0
8	0.8000	2.3
9	0.9000	2.7
10	1.000	3.1
11	1.100	3.5
12	1.200	4.1
13	1.300	4.7
14	1.400	5.4
15	1.500	6.3
16	1.600	7.2
17	1.700	8.3
18	1.800	9.6
19	1.900	11
20	2.000	13

Figure 10: Observation table for V_{BC}=5V

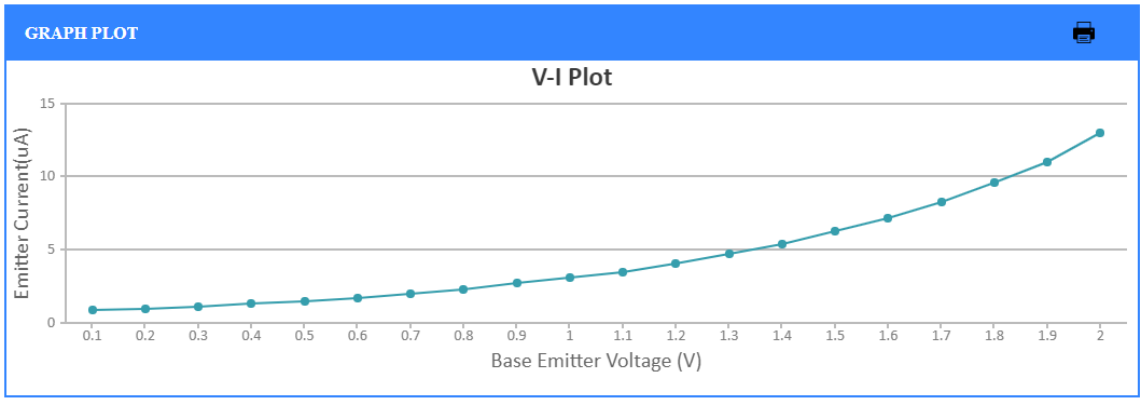

Figure 11: Emitter Current Vs Base-Emitter Voltage for V_{BC}=5V

Input resistance = $\triangle\ V_{BE}\ /\ \triangle\ I_E$

$=(1.3-0.8)V/(4.7-2.3)*10^{-3}A$

$=208.33\Omega$