MP309

Experiment 3

BJT Common Base Characteristics

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Roll no. :- I18PH037

Part 1 :-BJT CB Input Characteristics

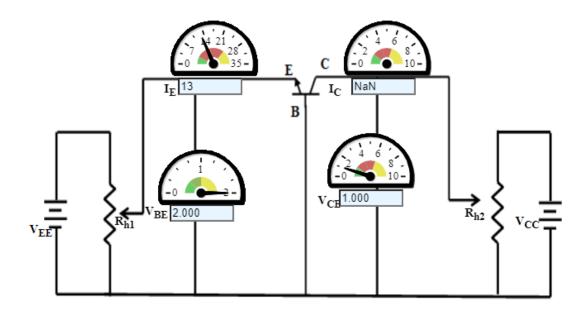


Figure 1: Circuit Diagram

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 $V_{BC}{=}1\mathrm{V}$

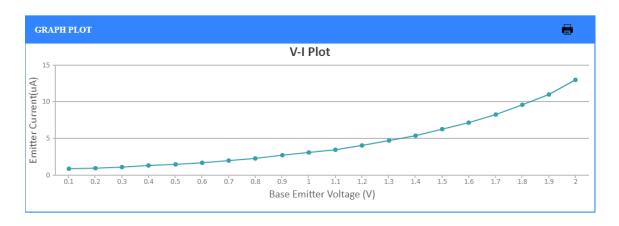


Figure 3: Emitter Current Vs Base-Emitter Voltage for $V_{BC}{=}1\mathrm{V}$

Input resistance =
$$\triangle V_{BE} / \triangle I_{E}$$

= $(1.2 - 0.7)V/(4.1 - 2.0) * 10^{-3}A$
= 238.095Ω

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

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

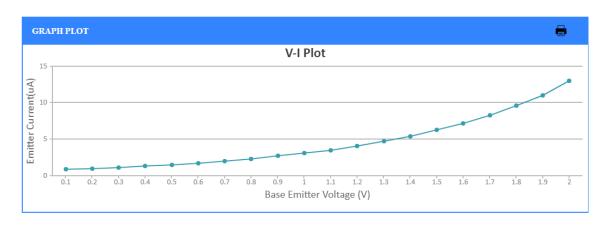


Figure 5: Emitter Current Vs Base-Emitter Voltage for $V_{BC}{=}2V$

Input resistance =
$$\triangle$$
 V_{BE} / \triangle I_{E}
= $(1.1-0.8)V/(3.5-2.3)*10^{-3}A$
= 250Ω

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

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

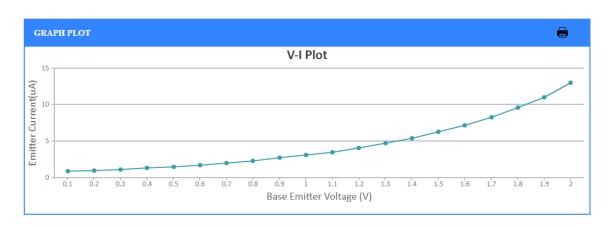


Figure 7: Emitter Current Vs Base-Emitter Voltage for $V_{BC}{=}3V$

Input resistance =
$$\triangle$$
 V_{BE} / \triangle I_{E}
=(1.1 - 0.7) V /(3.5 - 2.0) * $10^{-3}A$
= 266.66 Ω

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 $V_{BC}{=}4V$

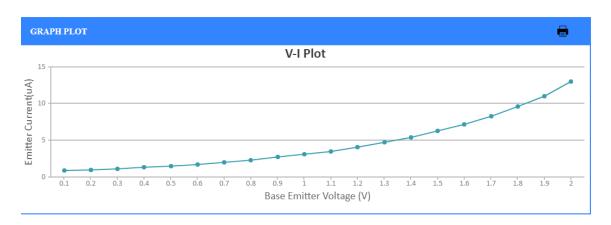


Figure 9: Emitter Current Vs Base-Emitter Voltage for $V_{BC}{=}4\mathrm{V}$

Input resistance =
$$\triangle$$
 V_{BE} / \triangle I_{E}
=(1.3 - 0.7) V /(4.7 - 2.0) * $10^{-3}A$
= 222.22 Ω

EXPERIMENTAL TABLE			
G . 1	Base-Collector Voltage 5.000 V		
Serial No.	Base-Emitter Voltage V	Emitter Current mA	
1	0.1000	0.85	
3	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

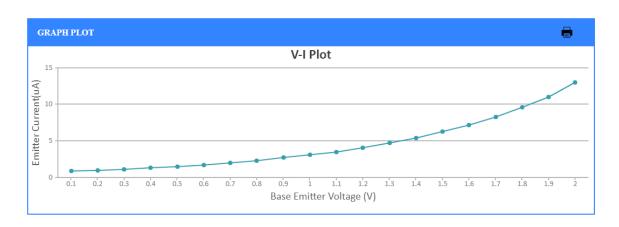


Figure 11: Emitter Current Vs Base-Emitter Voltage for $V_{BC}{=}5\mathrm{V}$

Input resistance =
$$\triangle$$
 V_{BE} / \triangle I_{E}
=(1.3 - 0.8) V /(4.7 - 2.3) * $10^{-3}A$
= 208.33 Ω