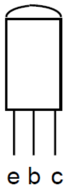
Working file

Lab 7 – Bipolar Transistor (2)



Transistor pin connections

Experiment 1: For Figure 1:

- Connect the circuit, realize that base is held near ground by (100Ω), and the emitter is attached to 1kΩ t0 -5.7 volts (forward bias EBJ)
- Measure   by 0.7 V (for silicon)
- If you ever see a larger difference, the transistor is burned

Almost all goes to the collector (): is large

Only goes to the base (). Compute ?

- Measure , , and
- Then find:

Remember to use the correct values of the resistors and

input voltage sources

- Record these values in a table

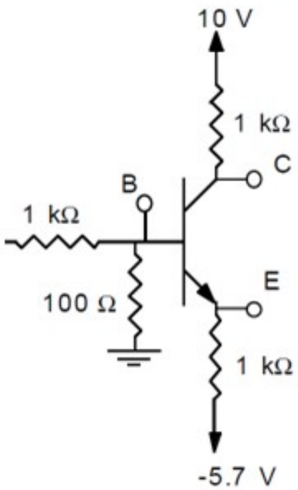


Figure 1

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Experiment 2:

- Connect Input (Vin) to the 1k at the Base (B).
- Use it to apply voltages 0 to 1 (step 0.1)
- Measure and

  of and at different values of Vin
- Plot(2 Plots)
- Compute the gain at C and E

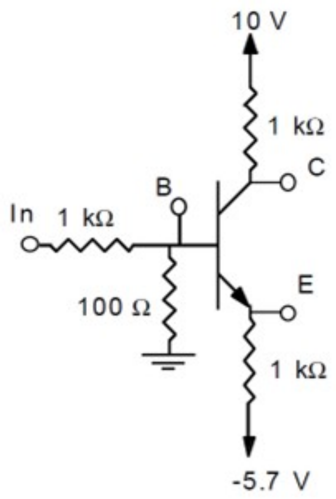

Figure 2

[V]	[V]	[V]	[V]	[V/V]	
-	-	-	-	-	-
-	-	-	-	-	-

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	[V]	[V]	[V]	[V]	[V/V]	
	-	-	-	-	-	-
	-	-	-	-	-	-

Experiment 3: For Figure 2:

- Use Function Generator to apply 0.2 sine wave @ to Vin
- Observe @ point C and E with the scope. Capture the displays of the oscilloscope.
- Compute the gain @ point C and E= =
- Repeat with applying 2 sine wave @

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Experiment 4: For Figure 3:

- Disconnect the sine wave (AC) voltage supply and connect Vin to a 10V DC voltage supply, measure and . Then, connect the 10 uF capacitor to E and measure and Compare the values of and before and after connecting the capacitor.
- Disconnect the DC voltage, and apply signal **less than** 0.1 sine wave @
- Observe @ point C with the scope. Capture the displays of the oscilloscope
- Compute the gain @ point C =
- Vary the input frequency to find a lower frequency where the gain drops 0.71 of its high frequency value (this frequency is called the break point frequency)

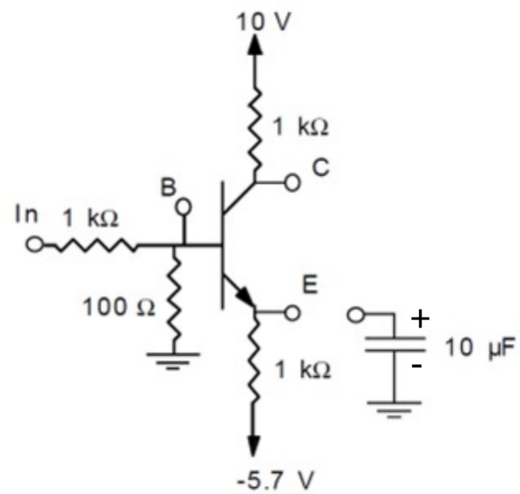

Figure 3

Lab 7 Report

- Include to your circuit image in practical implementation, oscilloscope displays.

Questions and Requirements

- Experiment 1: A table contains the values of , , , , ,
- Experiment 2: A table contains the values of at different values of Vin.

Plot

- Experiment 3: The displays of the oscilloscope at C, E for 0.2 sine wave and 2 sine wave.

The gains at C,E for 0.2 sine wave and 2 sine wave.

- Experiment 4: The values of , before and after connecting the capacitor are the same. Why? Hint: In DC circuit, How does the capacitor act as after the transient time, Does it allow current to flow through it?

Questions and Requirements

- Experiment 4:In AC signal: the display of oscilloscope at C for signal less than 0.1 sine wave. What is the gain?

Compare this gain to the gain you obtained from experiment 3. Why the gain is larger than the one in experiment 3?

From the DC, AC signals' measurement, Comment on the advantages of the capacitor in this experiment

What is the break point frequency?