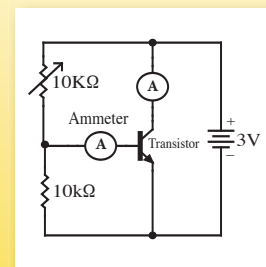
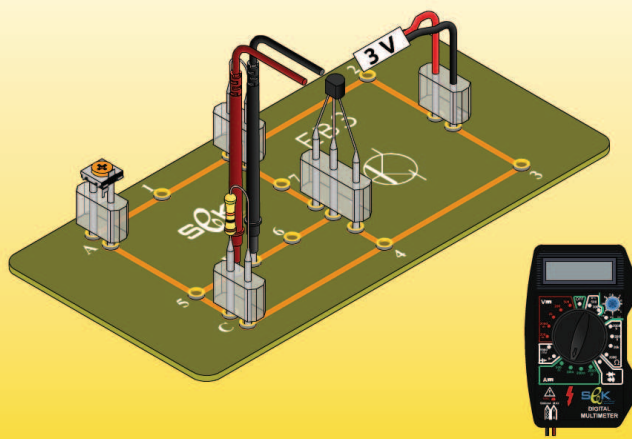


Experiment No. (36) Transistor as an Amplifier



Objectives:

1. The student will set up an amplification circuit using the transistor.
2. The student will calculate the amplification factor (gain) of a transistor.

Apparatus:

- | | | |
|------------------------------|---------------------|-------------------|
| • EB3 Board | • Resistor 10KΩ | • Connection Wire |
| • Voltage Source (PSB Board) | • Mini Screw Driver | • Transistor |
| • Variable resistor 10KΩ | • DMM | • Jumper |

Procedure and Conclusions:

1. Use EB3 Board to set up a circuit by inserting the transistor at (F) in a way that the collector will be towards the point (7), a resistor 10KΩ at the pair (C), a variable resistor 10KΩ at the pair (A), and a jumper at the pair (E).
2. Connect (3 volt) from PSB Board to the pair (B) using a connection wire in a way that the positive terminal (red wire) will be towards the point (2).
3. Turn the selection dial of the DMM to DCA mode (range 200mA), insert its probes at the pair (D) to measure the base current (I_b). Record the Ammeter reading in the table below.
4. Using a mini screw driver, rotate the wiper for the variable resistor clockwise and anticlockwise until the Ammeter gives a base current reading 0.2mA.
5. Set the Ammeter to the range 200mA, insert its probes at the pair (E) instead of the jumper, this way you can measure the Collector current

- (Ic), insert a jumper at the pair (D). Record the Ammeter reading of the collector current (Ic).
- Insert a jumper at the pair (E) instead of the probes, repeat steps 3 to 6, adjust the variable resistor to obtain different values for the base current (Ib) (0.3, 0.4 and 0.5mA). Record the corresponding Ammeter readings in the table.
 - Calculate the Amplification Factor (hfe) using the formula ($hfe = I_c/I_b$), record the results in the table.
- Table for (Ib) current and corresponding (Ic) current, where (hfe) is the amplification factor:

Base Current (Ib) (mA)	Collector Current (Ic) (mA)	Amplification Factor ($hfe = I_c/I_b$)
0.2		
0.3		
0.4		
0.5		

- Compare the results you calculated for the Amplification Factor with the values in the transistor datasheet available in the index C.



Notes:

- Many modern digital multimeters have a socket for testing the (hfe) of the transistors as shown in the photo below.

