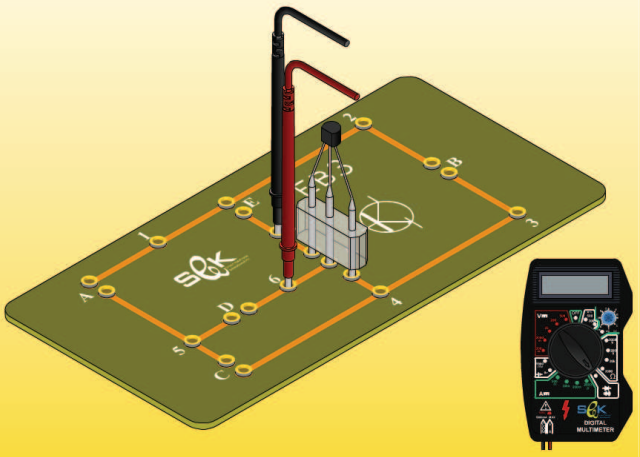
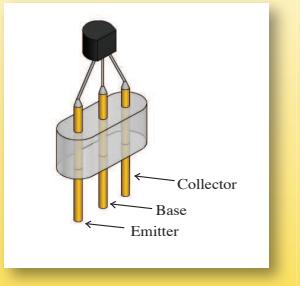
Experiment No. (32) The Transistor





Objectives:

1. The student will differentiate between NPN and PNP transistors.
2. The student will be able identify each terminal of a transistor (Emitter, Base & Collector)
3. The student will be able to test a transistor.

Apparatus:

- EB3 Board
- DMM
- Transistor

Procedure and Conclusions:

1. Insert a transistor at the pair (F).
2. Assume that the transistor is NPN.
3. Assume that the transistor base is the terminal connected to the point (7).
4. Turn the selection dial of the DMM to the Ohm mode (range 2000Ω), insert the DMM red probe at the point (7) and black probe at the point (6) then at point (4), record Ohmmeter readings.
   - The reading of the Ohmmeter between the points (7) and (6) is ....., and between the pints (7) and (4) is .....
5. If you get readings in both cases (e.g. 850 & 860), this indicates that our assumption is correct i.e. the transistor is NPN and the base is the terminal

connected to the red probe and the emitter is the terminal which gives the higher value on the Ohmmeter.

6. If you get one reading only or no readings in both cases then the assumed base terminal is wrong, then assume that the transistor base is the terminal connected to the point (6), insert the positive probe at the point (6), and the black probe at the point (4) then at point (7), record Ohmmeter readings.

- The reading of the Ohmmeter between the points (6) and (4) is ....., and between the pints (6) and (7) is .....

7. If you get readings in both cases (e.g. 850 & 860), this indicates that our assumption is correct i.e. the transistor is NPN and the base is the terminal connected to the red probe (point 6), and the emitter is the terminal which gives the higher value on the Ohmmeter.
8. If you get one reading only or no readings in both cases then the assumed base terminal is wrong, then assume that the transistor base is the terminal connected to the point (4), insert the positive probe at the point (4), and the black probe at the point (6) then at point (7), record Ohmmeter readings.

- The reading of the Ohmmeter between the points (4) and (7) is ....., and between the pints (4) and (6) is .....

9. If you get readings in both cases (e.g. 850 & 860), this indicates that our assumption is correct i.e. the transistor is NPN and the base is the terminal connected to the red probe (point 4), and the emitter is the terminal which gives the higher value on the Ohmmeter.
10. If none of the three precedent assumptions is correct then the transistor is PNP, and you can identify its terminals by touching the black probe to the assumed base terminal, and repeat the precedent steps.
11. If all assumptions don't work, then the transistor is bad.

- We conclude that the transistor that is available in the kit is ... PNP / NPN ...

Discussion

1. Discuss the functional difference between a PNP transistor and an NPN transistor.