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**Lyceum of the Philippines**

**University**

**Grade**

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**Experiment # 1: Testing a Transistor using an Ohmmeter**

**Objective:**

Upon the completion of this activity, the student must be able to test the characteristics of a good transistor.

**Data Analysis:**

Experimentation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** | **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** |
| B | E | HR | E | B | LR |
| B | C | HR | C | B | LR |
| C | E | HR | E | C | HR |

Table 1

* How many low-resistance reading have you observed from the reading of data (resistance) reading of Table 1? Under these low-resistances reading, what is the common terminal?
  + There are two low-resistances reading that we have observed from the data and the common terminal between the two is the base.
* What biasing is applied on the terminals that indicated a low-resistance reading? On the terminals that indicated a high-resistance reading?
  + The biasing that is applied on the terminals that indicate a low-resistance reading is forward biased and on the other hand, the terminals that indicate a high-resistance reading is reverse biased.
* What have you observed from the resistance read on the collector and emitter terminals on either bias?
  + There is no deflection happened upon testing the collector and emitter terminals resulting them to be in a high-resistance state.
* Is the transistor NPN or PNP type? How did you know?
  + The transistor is NPN type. After connecting the (+) probe to the emitter terminal and the (-) probe to the base terminal, the meter deflected denoting a low-resistance and this means that the transistor was forward biased.

Evaluation

What will be the possible resistance readings of Table 1 if the transistor happens to be defective? List the resistance values below.

1. TABLE 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** | **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** |
| B | E | LR | E | B | LR |

1. TABLE 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** | **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** |
| B | C | HR | C | B | HR |

1. TABLE 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** | **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** |
| C | E | LR | E | C | LR |

1. What is the transistor schematic symbol of the transistor you have just tested? (Please draw)

C

B

E

1. Supposing that the transistor you have just tested in Figure 1 is of opposite type (from NPN to PNP or vice-versa) and the transistor is good, what would be the resistance readings that will be observed on Table 1? List down the values below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** | **(+) Probe** | **(-) Probe** | **Resistance (LR/HR)** |
| B | E | LR | E | B | HR |
| B | C | LR | C | B | HR |
| C | E | HR | E | C | HR |

**Discussion:**

On our experiment we are given a transistor without knowing if it is a NPN or PNP type. We are given the task to determine if it is a good or a bad transistor and identify what type of transistor it is.

To determine if the transistor is of a NPN or PNP type, we used an analog multi-meter. We set the multi-meter to ohmmeter and we check the resistance between each combination of pins of the transistor. By checking how the meter would deflect on each combination we can determine if the transistor is of NPN or PNP type.

In determining if the transistor is good or bad, we simply need to reverse the position of the probes on the terminals that are indicating it is a NPN type transistor. In this case putting the negative probe of the ohmmeter on the base of the transistor and the positive probe on either the collector or emitter terminal it would not deflect indicating a high resistance therefore it is in good condition.

**Conclusion:**

I therefore conclude that by using an analog multi-tester set on ohmmeter setting one can determine what type of transistor he is facing and he can also determine if it is in good or bad condition.