Feng Chia University

Electrical Engineering Fundamentals I Lab

# Laboratory 9

# Diodes V-I Characteristics

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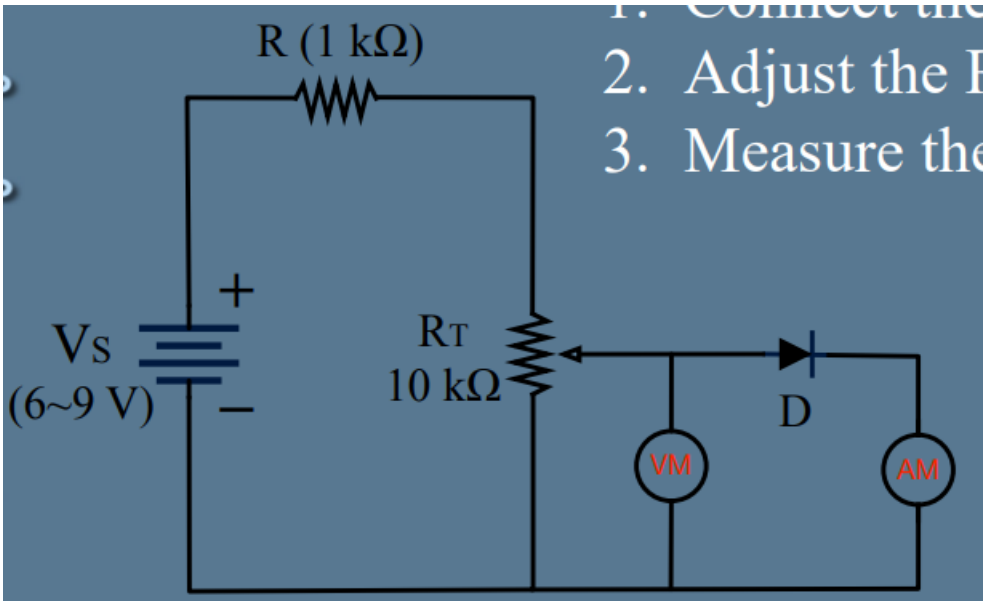
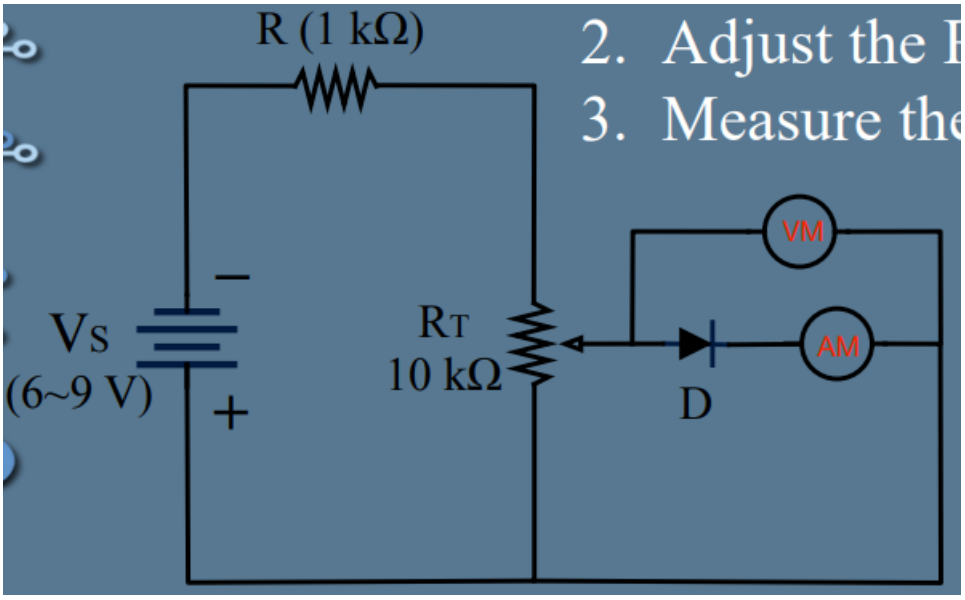
I. Introduction
   a. To apply the forward and reverse bias to a diode
   b. To understand the voltage current characteristics of a diode
II. Materials
   a. DC Power Supply
   b. Digital multimeter
   c. Devices
      1. Variable Resistor RT 10 kΩ (B) ×1
      2. Resistors: R = 1 kΩ ×1
      3. Diode: D 1N4001 ×1
III. Circuit diagram




▲ Figure 1. Circuit of Experiment 9.a Forward Bias Measurement




▲ Figure 2. Circuit of Experiment 9.b Reverse Bias Measurement

## IV. Methods

Use digital multimeter to measure voltage and current across the diode.

## V. Experiments data

### a. Experiment 9.a

Table 1: Results of forward bias measurement across the diode

| Forward Bias | 0 V | 0.1 V | 0.2 V | 0.3 V |
|---|---|---|---|---|
| Forward Current | 0.3 μA | 0.4 μA | 0.6 μA | 1.8 μA |

| Forward Bias | 0.4 V | 0.5 V | 0.6 V | 0.6201 V |
|---|---|---|---|---|
| Forward Current | 19.2 μA | 189.1 μA | 1366.3 μA | 2000 μA |

### b. Experiment 9.b

Table 2: Results of reverse bias measurement across the diode

| Reverse Bias | 0 V | 0.5 V | 1 V | 2 V |
|---|---|---|---|---|
| Reverse Current | 0.3 μA | 0.4 μA | 0.4 μA | 0.4 μA |

| Reverse Bias | 3 V | 4 V | 5 V |
|---|---|---|---|
| Reverse Current | 0.4 μA | 0.5 μA | 0.6 μA |

## VI. Results

None

## VII. Discussion

It’s hard to adjust variable resistor, a little bit of move will cause tremendous changes. Nevertheless, sometimes, the variable resistor can’t let the voltage be zero, it might be replaced by greater variable resistor in order to approach zero voltage.

## VIII. Conclusion

By measuring voltage and current across the diode, it’s easy to determine either forward bias or reverse bias.