University of Information Technology and Sciences (UITS)
Department of Information Technology

Lab Report : 1

ECE-252 : Electronic Devices and Circuits Lab

Familiarization with the IV characteristics of the general purpose Rectifier Diode

Submitted To:

Priti Bose
Lecturer,
Department of EEE,
UITS

Submitted By:

Name:Nazmul Zaman
Student ID:2014755055
Department of IT, UITS

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1 Objective

The objective of familiarization with the IV characteristics of the general-purpose Rectifier Diode is to learn about the forward-bias voltage drop and the reverse-bias leakage current of the diode. In this lab report, I will learn about the basic principles of semiconductor diodes and how they are used in electronic circuits. And after completion of this lab report, I will be able to understand the basic operation of the diode and learn how to determine the diode parameters from its IV characteristics.

2 Theory

The diode is a device formed from a junction of n-type and p-type semiconductor material. The lead connected to the p-type material is called the anode and the lead connected to the n-type material is the cathode. In general, the cathode of a diode is marked by a solid line on the diode.The primary function of the diode is rectification. When it is forward biased (the higher potential is connected to the anode lead), it will pass current. When it is reversed biased (the higher potential is connected to the cathode lead), current flow is blocked.A general curve looks like this: In the forward-bias region the V-I relationship is described as follows: I = Is(e V nVT − 1) In the above equation, I is the forward current, V is the forward voltage, It is the saturation current, and VT = kT /q is the thermal voltage. Initially, the V vs I graph is linear but then after reaching breakdown, it becomes exponential.

3 Apparatus List

Name	Rating	Quantity
1. Bread Board	-	1
2. Diode (0.7V)	-	1
3. Resistor	1KΩ	1
4. DC voltage supplier	16V	1
5. Voltmeter for measuring Voltage	-	2
6. Ammeter for measuring Current	-	1
7. Some crocodile clip	-	-
8. Some connecting Wire	-	-

Figure 1: Table of Apparatus list that I used to examine this lab report.

4 Circuit Diagram

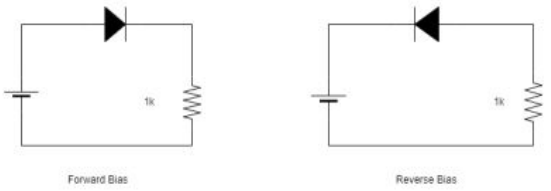

Figure 2:

5 Data Table

5.1 Reverse Bias

Applied Voltage	Diode (V)	Current (I) mA
5	5.0	0
10	10	0
15	15	0
16	16	0

Figure 3: Data Table for Reverse Bias

5.2 Forword Bias

6 Result

After completing this lab report, now I can say that it enables me to identify the ideal diode operating region, the forward-bias voltage drop, and the reverse-bias leakage current. In addition, now I'm able to calculate the rectification efficiency and determine the maximum power dissipation of the diode.

Applied Voltage	Diode (V)	Current (I) mA
0.3	0.28	0
0.6	0.49	0
0.9	0.53	0.5
1.2	0.57	0.75
1.5	0.58	1
1.8	0.59	1.375
2.1	0.60	1.625
2.4	0.61	2
2.7	0.62	2.375
3	0.62	2.6
3.3	0.65	3
6	0.66	7.35
7	0.67	8.5
8	0.68	10
9	0.68	11.25
10	0.69	12.5

Figure 4: Table data for Forword Bias

7 Conclusion

This Rectifier Diode can help one to better understand the behavior of diodes in circuits, and how to design circuits using diodes. Additionally, it can help one to understand the limitations of diodes and how to avoid damaging them. And it is a good idea to use a rectifier diode for applications that require a large current.

8 References

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