



UNIVERSITY OF INFORMATION  
TECHNOLOGY AND SCIENCES (UITS)  
DEPARTMENT OF INFORMATION TECHNOLOGY

LAB REPORT : 3

ECE-252 : ELECTRONIC DEVICES AND CIRCUITS  
LAB

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To study of IV characteristics of  
Zener Diode

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*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

- 1) Obtain I-V characteristics of zener diode.
- 2) To study zener diode as voltage regulator.
- 3) To calculate percentage line and load regulation.
- 4) Draw Graph by using different output and draw circuit diagram.

## 2 Theory

The zener diode is fabricated with a heavily doped Silicon diode. It conducts excellently in reverse biased condition. This diode operates at a precise value of voltage called break down voltage. When a Zener diode is forward biased, it behaves like an ordinary P-N junction diode. But when it is reverse biased, it can undergo avalanche break down or zener break down.

## 3 Apparatus List

SL no.	Name	Ratings	Quantity
1	Bread Board	—	1
2	Zener Diode	—	1
3	Resistor	1K $\Omega$	1
4	DC Voltage Supplier	(0-16) V	1
5	Voltmeter for measuring voltage	(0-20) V	1
6	Ammeter for measuring current	(0-200) mA	1
7	Crocodile Clip	—	4
8	Connecting wire	—	2+2

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

## 4 Circuit Diagram

### 4.1 Forward Bias

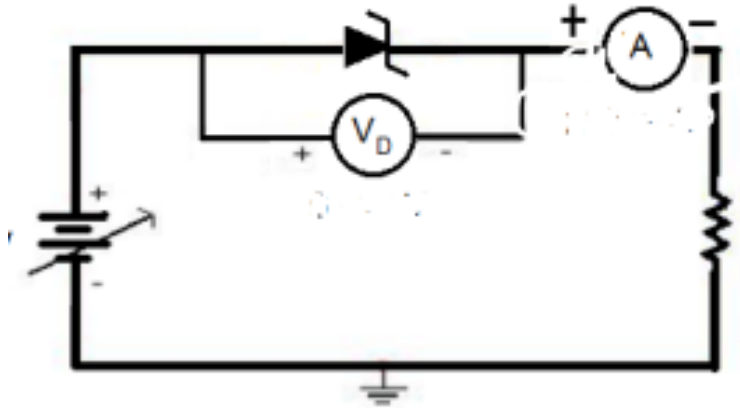


Figure 2: Forward Bias

### 4.2 Reverse Bias

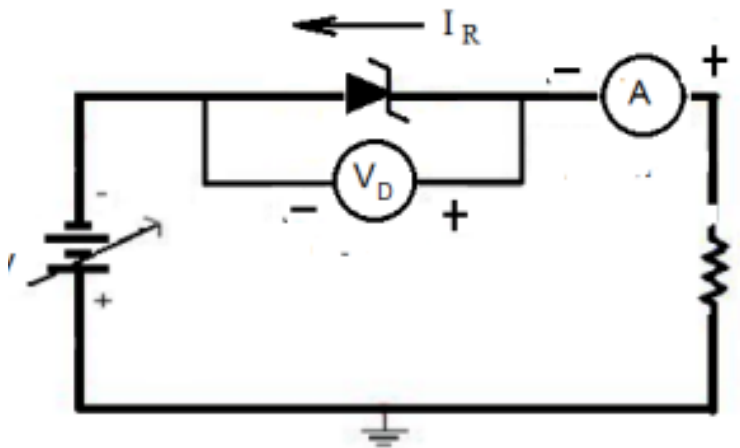


Figure 3: Reverse Bias

## 5 Data Table

### 5.1 Forward Bias

Supply (V)	Diode Voltage (V)	Diode (I) mA
0.5	0.55	0
1.0	0.73	0.5
1.5	0.75	1
2	0.76	1.5
3	0.78	2.5
4	0.79	3.5
5	0.798	4.5
6	0.8	5.5
8	0.81	7.5
10	0.82	9.5
12	0.833	11.5
14	0.833	13.5
16	0.84	15.5

Figure 4: Table data for Forward Bias

## 5.2 Reverse Bias

Supply (V)	Diode Voltage (V)	Diode (I) mA
1.25	1.251	0
2.04	2.037	0
3.02	3.010	0
5.02	5.03	0
7.04	5.56	0.5
9.02	5.58	1
11.16	5.58	1.5
13.14	5.59	2
15.00	5.59	2.5
17.10	5.59	3

Figure 5: Table data for Reverse Bias

## 6 Result

When the voltage across a zener reaches this breakdown voltage, also known as the zener voltage of a zener diode,  $V_Z$ , the voltage that a zener drops across itself will stop increasing. This is an important property of zener diodes. For instance, if the voltage feeding a zener diode is roughly 7.04 and the zener voltage of the diode is 5.1V, the zener will drop 5.59V across its terminals. Now, even though the voltage (and current) supplying it is rising, if the voltage keeps rising, say, to 17V, the zener diode will maintain its zener voltage, 5.59V.

## 7 Conclusion

The V-I characteristic of Zener diode indicates that characteristic of Zener diode in forward bias is same as PN junction diode. In reverse bias, a negligible constant current flows through the Zener diode but the current becomes abruptly large at certain voltage. This voltage is called as Zener voltage. This sudden and sharp increase in Zener current is called as Zener breakdown.

This experiment is about to investigate the behavior of ZENER diode and analyze how it works. By observing the behavior of Zener diode on different applied voltages and finding the results and calculation for its practical proves.

## 8 References

1. <http://www.learningaboutelectronics.com/Articles/Zener-diode-IV-characteristics-curve>
2. <https://uomustansiriyah.edu.iq/media/lectures/6/620181218!065020AM.pdf>