



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

LAB REPORT : 4

ECE-252 : ELECTRONIC DEVICES AND CIRCUITS  
LAB

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**Study Of The Characteristics  
Light Emitting Diode Lab**

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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

The purpose of this experiment is to determine and plot the characteristics of the light emitting diode in the forward-bias region, and to compare between different colored diodes. 1. IN this lab report we can know the characteristics of Light Emitting Diode. 2. Measure the output current and measure the voltage. 3. Design circuit using a LED diode and other electronic circuits. [U+2981] Draw graph using the output values.

# 2 Theory

A Light Emitting Diode (LED) is a semiconductor device, which can emit light when an electric current passes through it. To do this, holes from p-type semiconductors recombine with electrons from n-type semiconductors to produce light. The Light-Emitting Diode (LED) is a semiconductor PN junction diode that emits visible light or near-infrared radiation when forward biased. LEDs switch off and on rapidly, are very rugged and efficient, have a very long lifetime, don't heat up, and are easy to use. They are used as indicators, displays, and as light transmitters. Various impurities are added during the doping process to vary the color output. The LED is basically, just a specialized type of PN junction diode, made from a very thin layer of fairly heavily doped semiconductor material. Fig.1 depicts the construction of the light emitting diode

# 3 Apparatus List

## Apparatus List:

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

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

## 4 Circuit Diagram

### 4.1

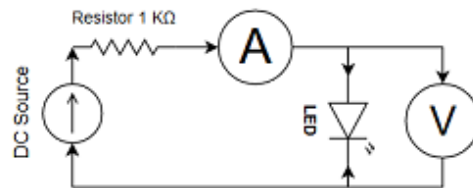


Figure 2: (Circuit diagram for Light Emitting Diode (LED) in forward bias)

### 4.2 Data Table

Supply (V)	Voltage (V)	LED (mA)	Comments
1.2	1.25	0	-
1.5	1.52	0	-
1.8	1.78	0.2	Low
2.1	1.79	0.5	Low
2.4	1.82	0.75	Low
2.8	1.84	1.0	Low Medium
3.2	1.85	1.5	Medium
3.6	1.87	2	Medium
4.0	1.88	2.5	Medium
4.3	1.89	3	High
4.6	1.90	3.5	High
4.9	1.91	4	High

Figure 3: Data Table

## 5 Result

Plot the relationship between the optical output power and emitter current. We can see the supply voltage, led across voltage, and when the led was on. Led voltage was 1.25 volts while supply voltage was 1.2 volts, and the led was off. Led supply voltage of 1.5 volts is not yet 1.52 led on. When the supply voltage was 2.1 volts, the led was on but at a very low voltage. Low voltage supply 2.1 to 2.8v led was on. The medium voltage LEDs had a supply voltage of 3.2 to 4.0 volts. Leds lit up brightly when the supply voltage ranged from 4.3 to 4.9 volts.

## 6 Conclusion

Experimentally, throughout this experiment, we can see that the characteristics of junction diode, Zener diode and also the light emitting diode almost fits the theoretical facts. They might varies as compared to the theoretical one because of the fact that real diode will be different from the ideal diode because of the effect from external force and environment. Infrared LEDs, which produce infrared radiation rather than visible light, are used in gadgets like remote controls and automatically focusing cameras.

## 7 References

[U+2981] <https://www.electronics-tutorials.ws/diode/diode8.html> [U+2981] <https://byjus.com/physics/light-emitting-diode/>