

Student Name: _____

Date Submitted: _____

Lab Partner(s): _____

BME 3511 Laboratory 6

Light Emitting Diode

Objective:

Become familiar with the basic characteristics of setting up a circuit with a light emitting diode connected in reverse and forward bias.

Background:

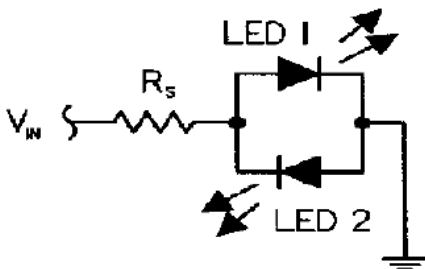
LEDs or **Light Emitting Diodes**, are semiconductor devices that produce visible light when an electrical current passed through them. Some Basic properties of LEDs are:

- Unlike ordinary incandescent bulbs, LEDs don't have a filament that will burn out
- LEDs don't get especially hot.
- They are illuminated solely by the movement of electrons in a semiconductor material, and they last just as long as a standard transistor.
- To distinguish the anode (positive) from the cathode (negative) of the LED just look at the plastic housing, If the LED has a flat area (on the plastic housing), the lead adjacent to the flat area is the negative (cathode) lead.

Lab Procedure:

I. Polarity Indicator

Construct a simple LED Polarity Indicator according to the following diagram.



Reverse the polarity of the input voltage and observe and record the results.

II. Reverse Bias

- 1) Confirm that the DC power supply is turned off.
- 2) Connect the power supply in series with the reverse bias LED and a 220 ohm resistor that are in series.

Note: The negative side of the power supply should be connected to the anode of the diode and the positive side of the power supply connected to the cathode.

Note: The resistor should be in series before the diode when considering conventional current flow in all parts of the lab.

- 3) Turn on the power supply and adjust the output to 6 VDC.
- 4) Confirm the VDC power supply voltage and current meter readings. Record your findings.
- 5) Measure the voltage across the diode and the voltage across the resistor. Record these values.
- 6) Measure the current in the circuit.

III. Forward Bias

- 7) Confirm that the DC power supply is turned off.
- 8) Connect the power supply in series with the forward bias LED and a 220 ohm resistor that are in series.

Note: The negative side of the power supply should be connected to the cathode of the diode and the positive side of the power supply connected to the anode.

- 9) Turn on the power supply and adjust the output to 6 VDC.
- 10) Confirm the VDC power supply voltage and current meter readings. Record your findings.
- 11) Measure the voltage across the diode and the voltage across the resistor. Record these values.
- 12) Measure the current in the circuit.

Data Collection:

LED Polarity Indicator

Circuit Specifications:		
	LED #1	LED #2
V_{LED}		
I_{LED}		
V_{IN}		
R_s		

LED Reverse Bias (6 VDC)			
DC Power Supply	Voltage Setting		
Circuit Measurements	Voltage Across Diode	Voltage across Resistor	Circuit Current

LED Forward Bias (6 VDC)			
DC Power Supply	Voltage Setting		
Circuit Measurements	Voltage Across Diode	Voltage across Resistor	Circuit Current

Solutions:

LED Polarity Indicator

Circuit Specifications:		
	LED #1	LED #2
V_{LED}		
I_{LED}		
V_{IN}		
R_s		

LED Reverse Bias (6 VDC)			
DC Power Supply	Voltage Setting		
Circuit Measurements	Voltage Across Diode	Voltage across Resistor	Circuit Current

LED Forward Bias (6 VDC)			
DC Power Supply	Voltage Setting		
Circuit Measurements	Voltage Across Diode	Voltage across Resistor	Circuit Current