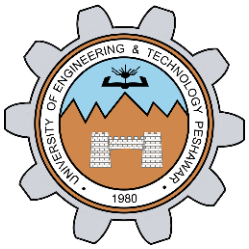
LAB 03

SERIES AND PARALLEL DIODES



Spring 2024

Submitted by: **Hassan Zaib Jadoon**
Registration No**: 22pwsce2144**
Class Section**: A**

"On my honor, as student of University of Engineering and Technology, I have neither givennor received unauthorized assistance on this academic work."

Submitted to:

Engr. Usman Malik

Month Day, Year (08 March 2024)

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

OBJECTIVES:

To study the characteristics of silicon diodes in series and in parallel.

EQUIPMENT:

- DC power supply
- Function Generator
- Digital Multimeter (DMM)

COMPONENTS:

- Diodes: Silicon (D1N4002)
- Resistor: 1.8 kΩ.

SERIES CONFIGURATION:

Series connection means a side-by-side connection. When two components are connected in series,they have one common junction. The variation of voltage and current in a series connection is as follows:

- Potential difference across every component is different.
- The current across every component connected in series remains the same.

Diode Characteristics in Series Configuration

When connected in series, we observe the following properties to hold true among the diodes:

- Resultant diode's forward voltage increases.
- Reverse blocking capabilities of diodes are increased in series connection.

PARALLEL CONFIGURATION:

Parallel connection means the components are connected across each other, having two common points. Current differs across each component while voltage drop is same. When diodes are connected in parallel,this same trend is observed.

Diode Characteristics in Parallel Configuration

- Current carrying capacity increases.
- No conduction in resultant diode in both sides.

DIODE IN SERIES:

Construct the circuit of Fig.1.0 with the supply (E) is set at 5 V. Record the measured value ofthe resistor.

PROCEDURE:

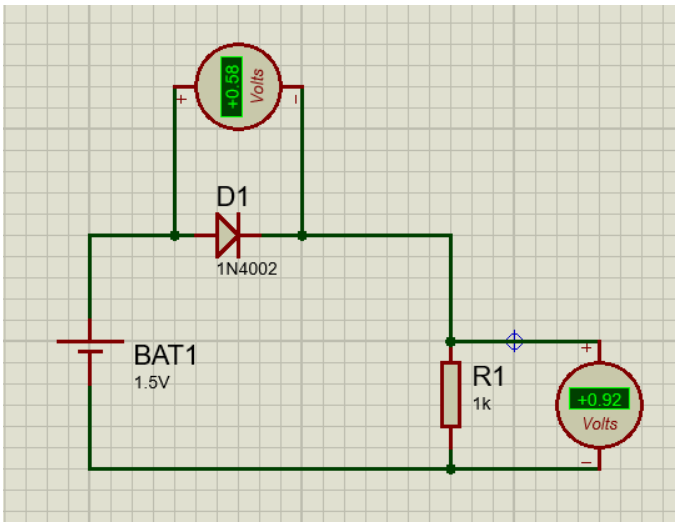


Figure 1: Diode series circuit

1. Construct the circuit as mention.
2. Measure the voltage across diode and resistor.
3. Calculate the current.

RESULT:

Supplied Voltage = 5.22
VVoltage VD = 0.63V
Resistance R = 1.76 kΩ
Voltage VO = 5.22 – 0.63 = 4.59 V

Current ID = 2.60 mA

Measured:

Supplied Voltage = 5.22 V

Voltage VD = 0.56V
Resistance R = 1.76
kΩVoltage VO = 4.67
V Current ID = 2.65
mA

2 Diodes in series:

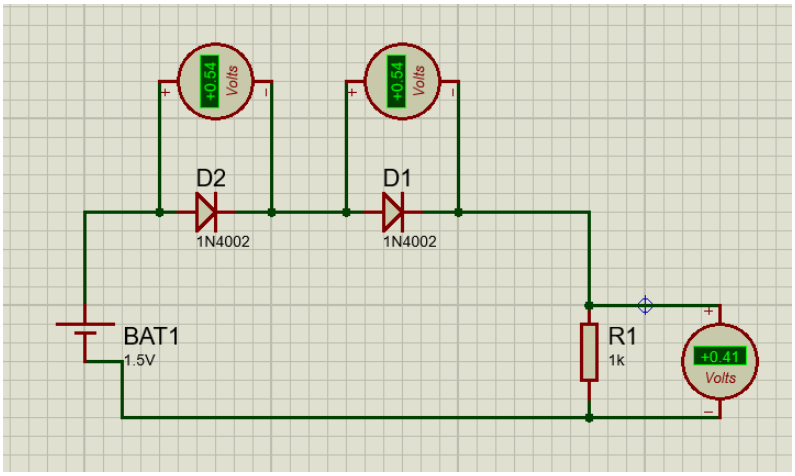


Figure 2:2 Diode in series

Procedure

:

1. Construct the circuit using two diodes and resistor in series.
2. Measure the voltage across two diodes and resistor.
3. Also calculate the current.

Results:

Supplied Voltage = 5.22
VVoltage VT1 = 0.63V
Voltage VT2 = 0.60V
Voltage VD = VT1 + VT2 = 1.23V

Resistance R = 1.76 kΩ

Voltage VO = 5.22 – 1.23 = 3.99 V

Current ID = 2.62 mA

Measured:

Supplied Voltage = 5.22
VVoltage VD = 1.23 V
Resistance R = 1.76 kΩ
Voltage VO = 4.13 V
Current ID = 2.34 mA

Diodes in parallel.

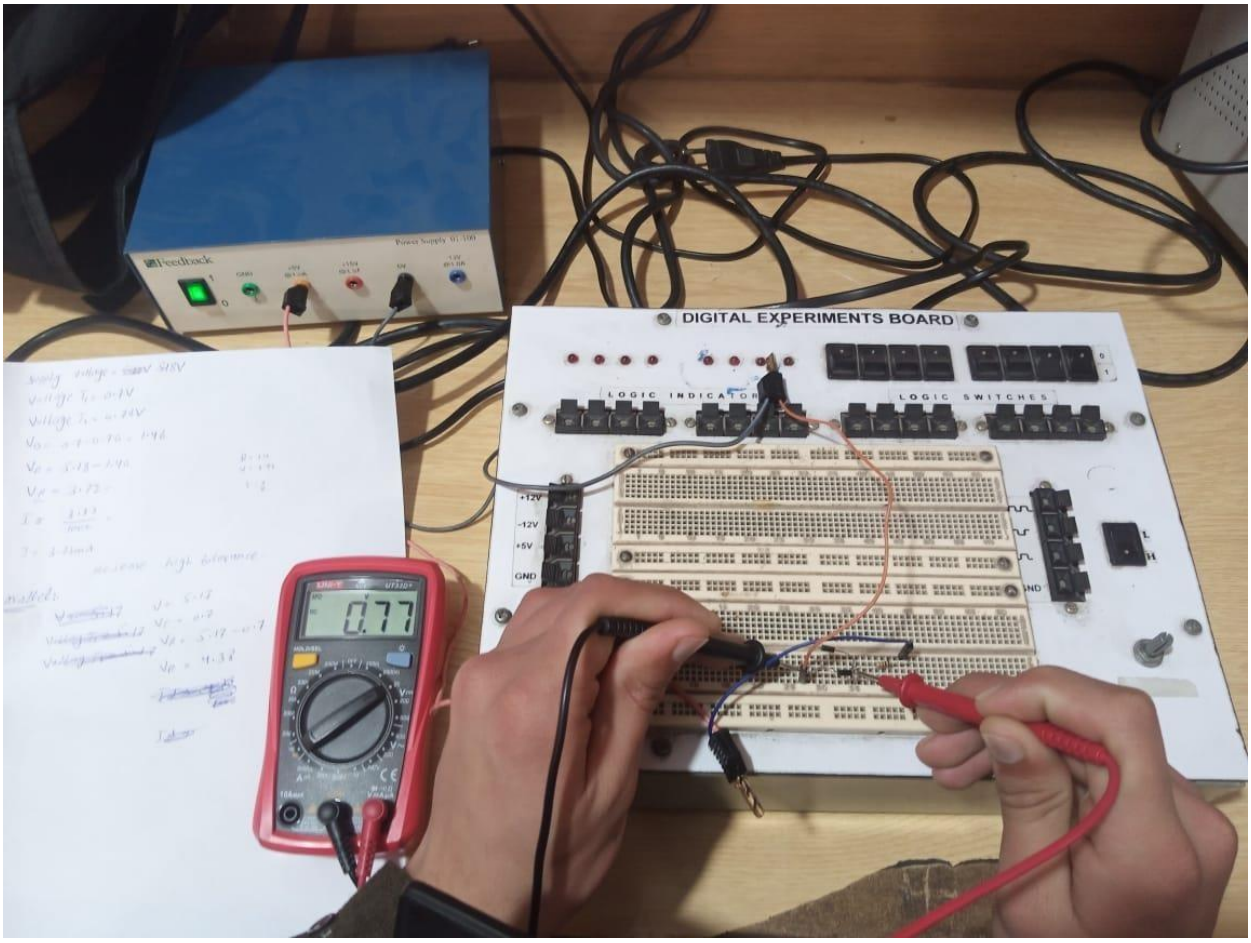


Figure 3: Parralel diode

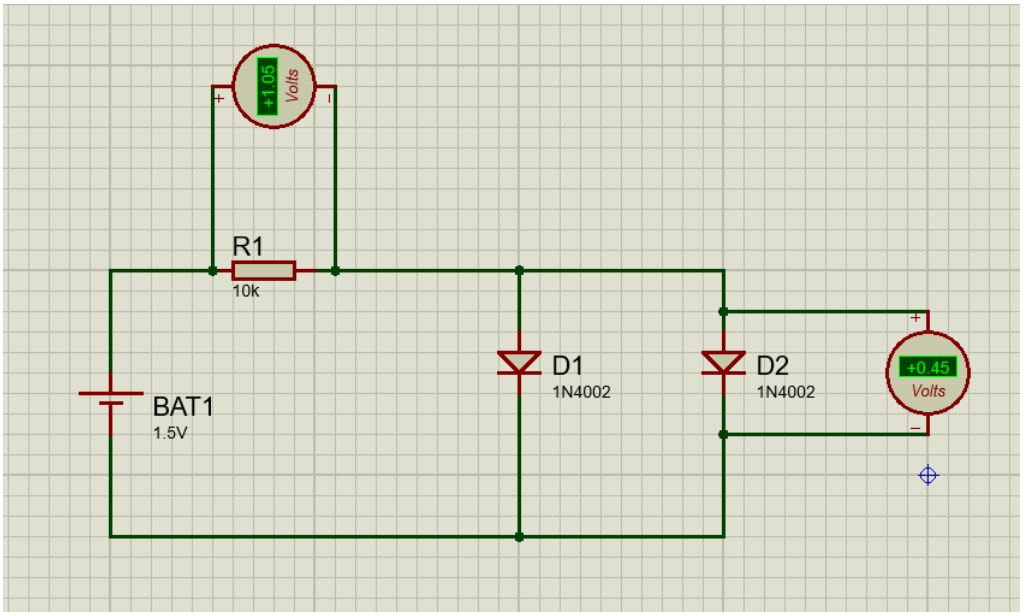


Figure 4: Diode in parallel

Procedure

:

1. Construct the circuit using two diodes and resistor in series.
2. Measure the voltage across two diodes and resistor.
3. Also calculate the current.

Results:

- Supplied Voltage = 5.22 V
- Voltage VT1 = 0.63V
- Voltage VT2 = 0.60V
- Voltage V = VT1 + VT2 = 1.23V
- Resistance R = 1.76 kΩ V
- Voltage VO = 0.60
- Voltage VR = 5.22 – 0.60 = 4.62

Measured:

- Voltage Vo = 0.53 V
- Voltage VR = 4.70 V