Chart, funnel chart

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|  |  |
| Report Title | Voltage Regulator |

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# Introduction

This report is for lab 3 “Bridge Rectifier”. The lab took place on 9 Feb 2022. The prelab is placed at the end of the report as an Appendix. A diode allows current to flow only in one direction which is a useful property in converting AC to DC.

# Objectives

The objective of this lab was to examine the difference of the output voltage of a bridge rectifier with and without a capacitor.

# Circuit Under Test

Diagram, schematic

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Figure 1

The circuit above in Figure 1 shows 4 1N4148 diodes connected to form a bride rectifier with two ends connected to an AC source and the other two ends connected to the resistor load/output.

Each pair of diodes are connected in head-to-tail with the input connected between them then the 2 pairs are connected with each other tail-to-tail on one side and head-to-head on the other the load/output is then connected between these terminals.

Diagram, schematic

Description automatically generated

Figure 2

The Circuit above shows circuit from Figure 1 but with a capacitor connected in parallel to the resistor load/output to get a more consistent DC output.

# Experimental and Results

The simulated circuit for E2:

A picture containing chart

Description automatically generated

The graphs for this circuit:

Chart, histogram

Description automatically generated

Output Graph:

Chart, histogram

Description automatically generated

The simulated circuit for E3: A picture containing calendar

Description automatically generated

The graphs for this circuit:

Graphical user interface, chart

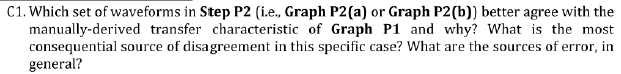
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Output Graph:

Chart

Description automatically generated

# Conclusions and Remarks



Graph P2(b) agrees with the transfer function of graph P1 becaue they both have a similar shape while all values are positive.

Text

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Chart, scatter chart

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Vs<-0.7

Vs-0.7-ID7\*Rs=0

ID7=(Vs-0.7)/Rs



Both graphs look identical to each other and have the shape of a y=|sin(x)| graph.

Text

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A perfect DC waveform is achieved when the resistance of the load increases because then more current will pass through the smoothing capacitor as they are both in series causing the capacitor to store more charge and dissipate more charge cause the DC waveform become more straight.

# Appendix – Prelab

Diagram, schematic

Description automatically generatedP1

Chart

Description automatically generated

P2:

For RL=1000 ohms

Vs:

Chart, line chart

Description automatically generated

Vi:

Chart

Description automatically generated

Vo:

Chart

Description automatically generated

For RL=270

Vs:

Chart, line chart

Description automatically generated

Vi:

Chart

Description automatically generated

Vo:

Chart

Description automatically generated

P3:

Diagram

Description automatically generated

Vi:

Chart

Description automatically generated

Vo:

Chart

Description automatically generated

Id:

Diagram

Description automatically generated

Chart

Description automatically generated

P4:

Max voltage = 8-2\*0.7 = 6.6V

Vr= 6.6 / (2\*500\*10-6\*5600) = 1.179

Vo= 6.6 V

Vr=1.179 V

Diagram, schematic

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For RL=5.6k ohm

Vs:

Chart, line chart

Description automatically generated

Vi:

Chart, line chart

Description automatically generated

Vo:

Table

Description automatically generated with medium confidence

RL=560 ohms

Vs:

Chart, line chart

Description automatically generated

Vi:

Chart, line chart

Description automatically generated

Vo:

A picture containing chart

Description automatically generated

RL=56 ohms

Vs:

Chart, line chart

Description automatically generated

Vi:

Chart

Description automatically generated

Vo:

A picture containing graphical user interface

Description automatically generated