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### Date: 10/25/2024

### Abstract

## Task 1

### Objective

The objective of this task is to demonstrate the creation and application of a buck converter.

### Procedure

First, the theoretical Vout,avg was computed. Afterwards, the circuit was constructed and the vpp and average of the vout was measured. Screenshots of the waveform were taken, and the efficiency of the circuit was measured. Vout was also measured and plotted against the duty cycle.

### Results

Circuit

A diagram of a circuit

Description automatically generated

A screen shot of a computer

Description automatically generated

100mV scale

A screen shot of a computer

Description automatically generated

1v scale

Vout avg vs duty cycle

### Conclusions

## Task 2

### Objective

### Procedure

### Results

Circuit

A diagram of a circuit

Description automatically generated

A screen shot of a computer

Description automatically generated

Vpp and vout avg at 200mV scale

A screenshot of a computer

Description automatically generated

Vpp and vout avg at 1V scale

### Conclusions

## Task 3

### Objective

The objective of this task was to demonstrate an inverted boost converter’s application.

### Procedure

First, the theoretical duty cycle was calculated. Next, the circuit was constructed and its vpp and average v of the vout was measured. The percent error and efficiency were calculated from the found and calculated values.

### Results

Circuit

A drawing of a circuit board

Description automatically generated

A screenshot of a computer screen

Description automatically generated

Vpp and voutavg at 200mV scale

A screenshot of a computer

Description automatically generated

Vpp and voutavg at 1V scale

### Conclusions

## Task 4

### Objective

The objective of this task is to use the boost and inverted boost circuits to demonstrate a dual rail power supply to drive an op-amp.

### Procedure

First, the circuit was constructed. Then, R1 and R2 were calculated to create a circuit with a gain of -4.7

### Results

Circuit

A diagram of a circuit

Description automatically generated

Circuit expanded

A diagram of a circuit

Description automatically generated

### Conclusions