

EE2315: Industrial Electronics Laboratory

Experiment 8: Voltage Multiplier

INTENDED LEARNING OUTCOMES:

- Be able to analyse and examine the characteristics of a voltage multiplier.
- Be able to measure and interpret the output voltage of voltage multiplier circuits using a circuit simulator.

PRE-LAB DISCUSSION:

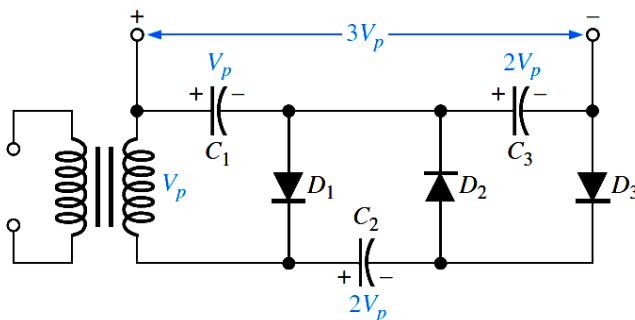
VOLTAGE-MULTIPLIER CIRCUITS

Voltage-multiplier circuits are used to produce dc voltages whose magnitudes are higher than the magnitude of the peak voltage of the input signal. The magnitude of the dc output voltage could be approximately two times, three times, four times, or other multiples of the magnitude of the peak voltage of the input signal.

Typically, voltage multiplier circuits use diodes and capacitors. Diodes conduct during certain portions of the input signal and capacitors charge during certain portions of the input signal.

Below is an example of a voltage multiplier circuit.

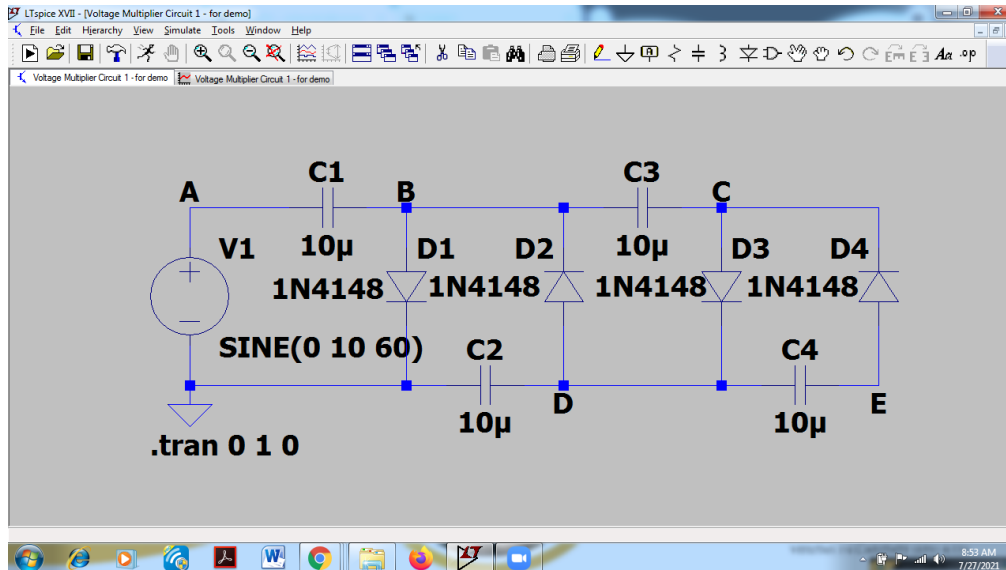
Voltage tripler



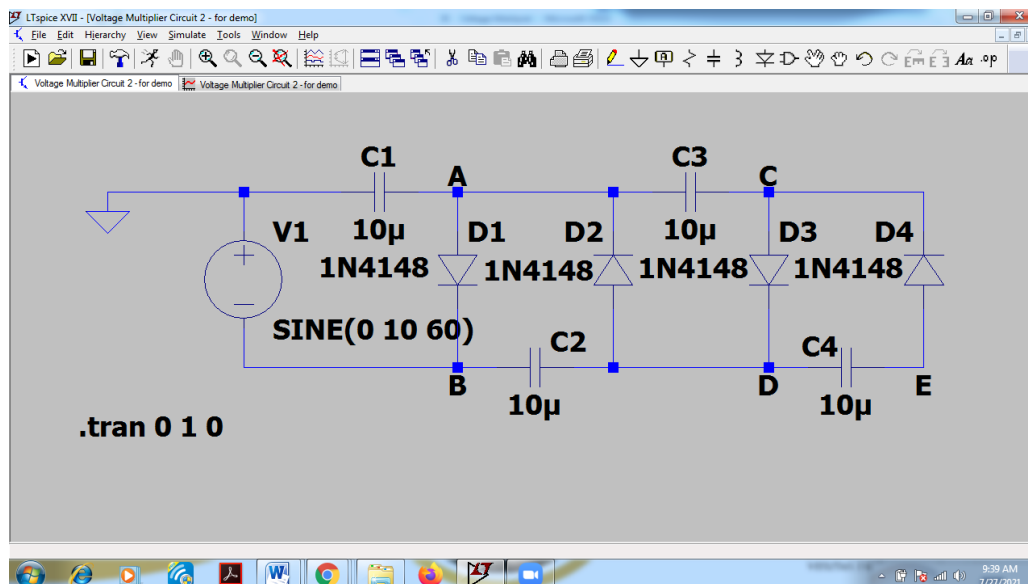
Note: From instrumentationtools.com

## PROCEDURE:

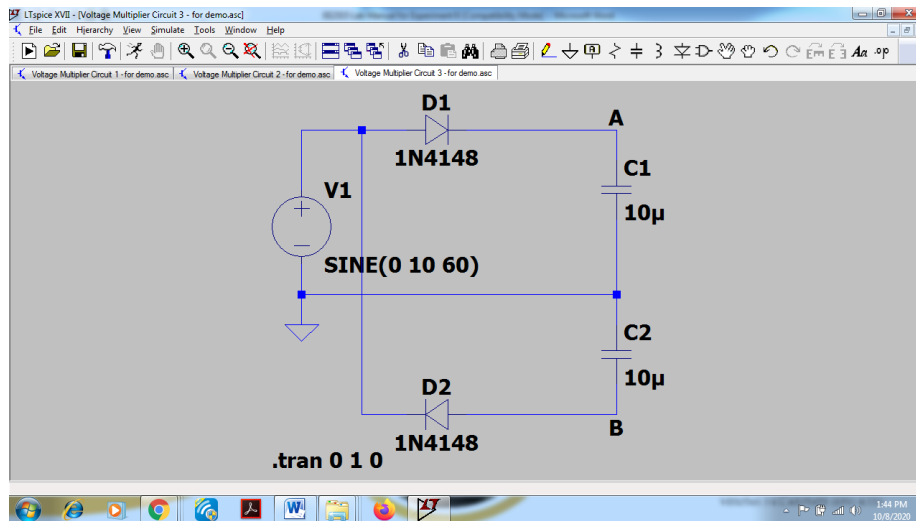
1. Construct the circuit shown below:



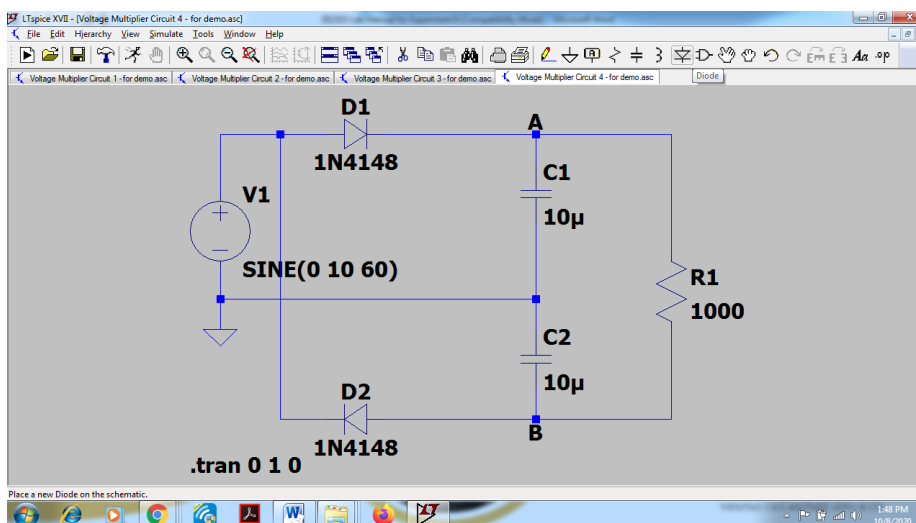
2. Measure the voltages between points A and B, points A and C, point D and the ground, and point E and the ground. Record the approximate magnitude of the DC voltages at time equal to 1 second on Table 1, and paste a picture of the waveforms on Table 1. Put your comments on the measured DC voltages compared to the peak voltage of the input signal and other results on Table 1.
3. Construct the circuit shown below.



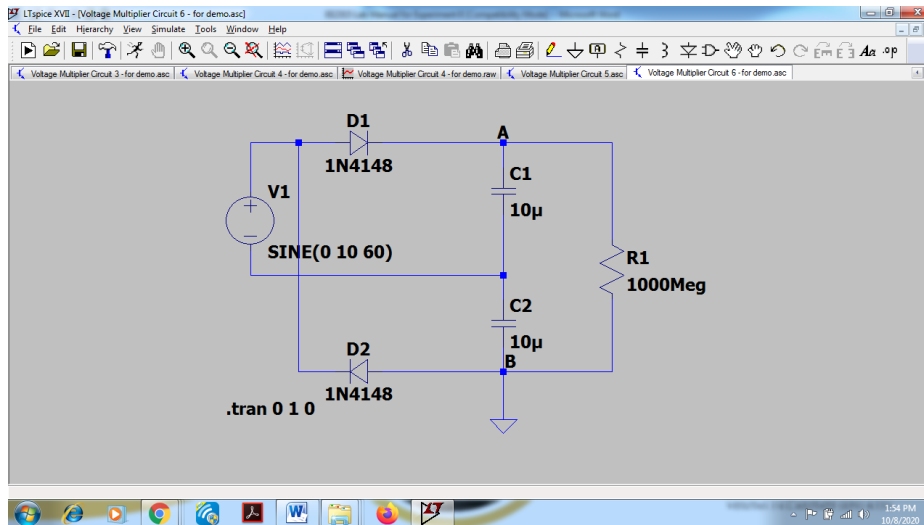
4. Measure the voltages between point A and the ground, point C and the ground, points B and D, and points B and E. Record the approximate magnitude of the DC voltages at time equal to 1 second on Table 2, and paste a picture of the waveforms on Table 2. Put your comments on the measured DC voltages compared to the peak voltage of the input signal and other results on Table 2.
5. Construct the circuit shown below.



6. Measure the voltages between point A and the ground, point B and the ground, and points A and B. Record the approximate magnitude of the DC voltages at time equal to 1 second on Table 3, and paste a picture of the waveforms on Table 3. Put your comments on the measured DC voltages compared to the peak voltage of the input signal and other results on Table 3.
7. Construct the circuit shown below.



8. Measure the voltages between point A and the ground, point B and the ground, and points A and B. Record the peak to peak voltages at time equal to 1 second on Table 4, and paste a picture of the waveforms on Table 4. Put your comments on the measured voltages compared to the input signal and other results on Table 4.
9. Construct the circuit shown below.



10. Measure the voltages between point A and the ground, point B and the ground, and points A and B. Record the magnitude of the DC voltages at time equal to 1 second on Table 5, and paste a picture of the waveforms on Table 5. Put your comments on the measured voltages compared to the input signal and other results on Table 5.

## Experiment 8: Voltage Multiplier Group Report

Group No.: \_\_\_\_\_

Group Members: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Table 1**

Voltage between points A and B	
Voltage between points A and C	
Voltage between point D and the Ground	
Voltage between point E and the Ground	
Picture of voltage between points A and B	
Picture of voltage between points A and C	
Picture of voltage between point D and the Ground	
Picture of voltage between point E and the Ground	
Comments on data and results:	

**Table 2**

Voltage between point A and the Ground	
Voltage between point C and the Ground	
Voltage between points B and D	
Voltage between points B and E	
Picture of voltage between point A and the Ground	
Picture of voltage between point C and the Ground	
Picture of voltage between points B and D	
Picture of voltage between points B and E	
Comments on data and results:	

**Table 3**

Voltage between point A and the Ground	
Voltage between point B and the Ground	
Voltage between points A and B	
Picture of voltage between point A and the Ground	
Picture of voltage between point B and the Ground	
Picture of voltage between points A and B	
Comments on data and results:	

**Table 4**

Peak to Peak Voltage between point A and the Ground	
Peak to Peak Voltage between point B and the Ground	
Peak to Peak Voltage between points A and B	
Picture of voltage between point A and the Ground	
Picture of voltage between point B and the Ground	
Picture of voltage between points A and B	
Comments on data and results:	

**Table 5**

Voltage between point A and the Ground	
Voltage between point B and the Ground	
Voltage between points A and B	
Picture of voltage between point A and the Ground	
Picture of voltage between point B and the Ground	
Picture of voltage between points A and B	
Comments on data and results:	

**Conclusion:**

<Inset Conclusion Here>