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EXPERIMENT

2

DIODE CLIPPER

I. OBJECTIVES:

1. To be able to observe and measure the relationship between the input and the output waveform.
2. To verify that voltage clipping results from the conduction of the diode with respect to the alternating current of the input signal.
3. To understand the theory of operation of diode in terms of clipping signals.

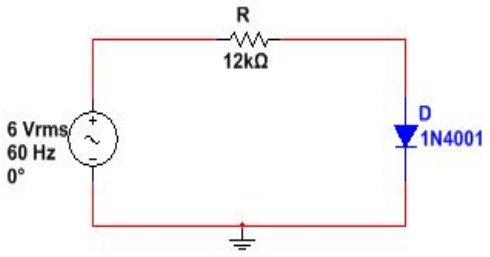
II. SOFTWARE:

1. MultiSim/iCircuit/Every Circuit/Electric Circuit Studio

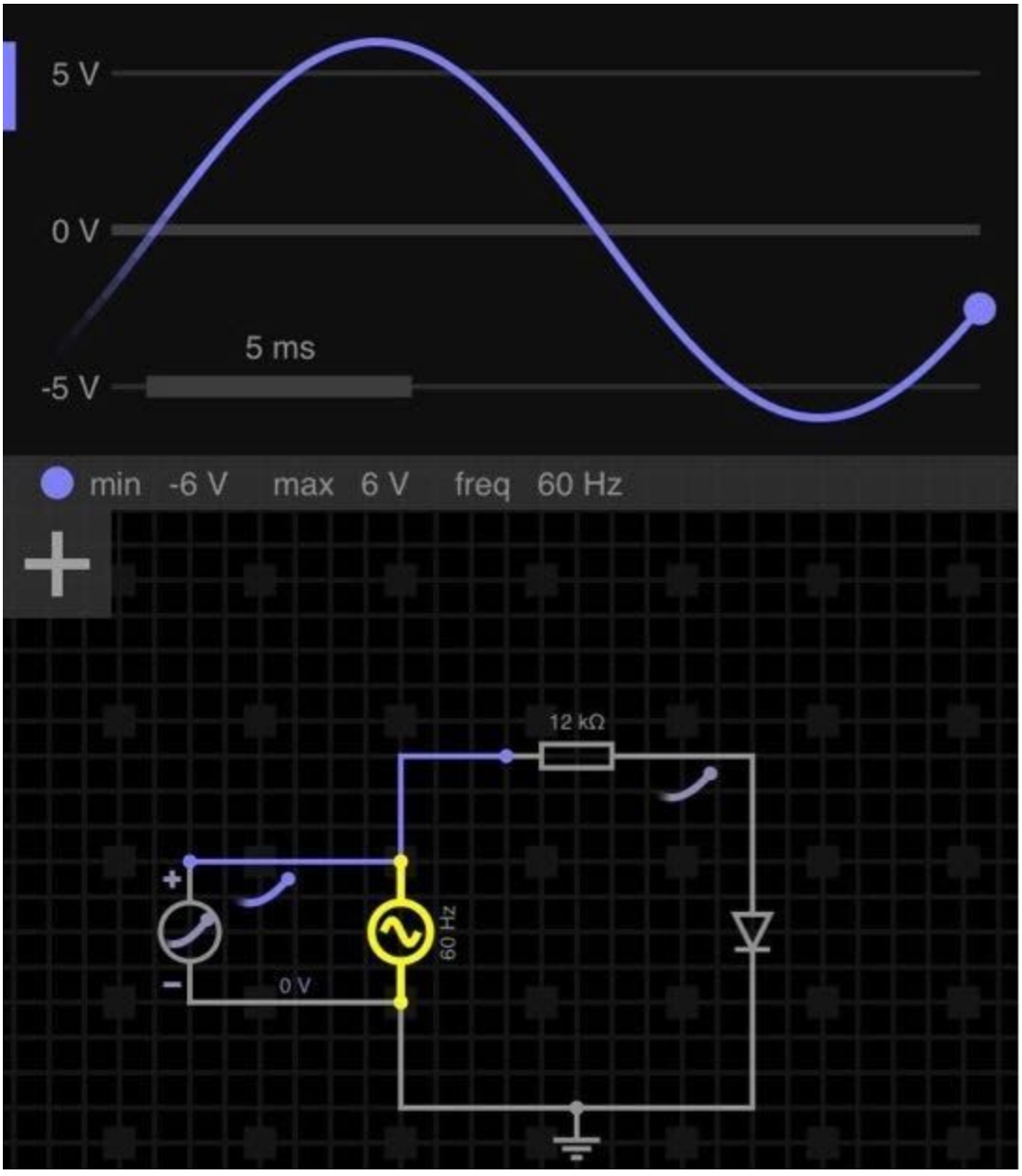
III. PROCEDURES:

I. Circuit A

1. Construct the circuit in the figure.

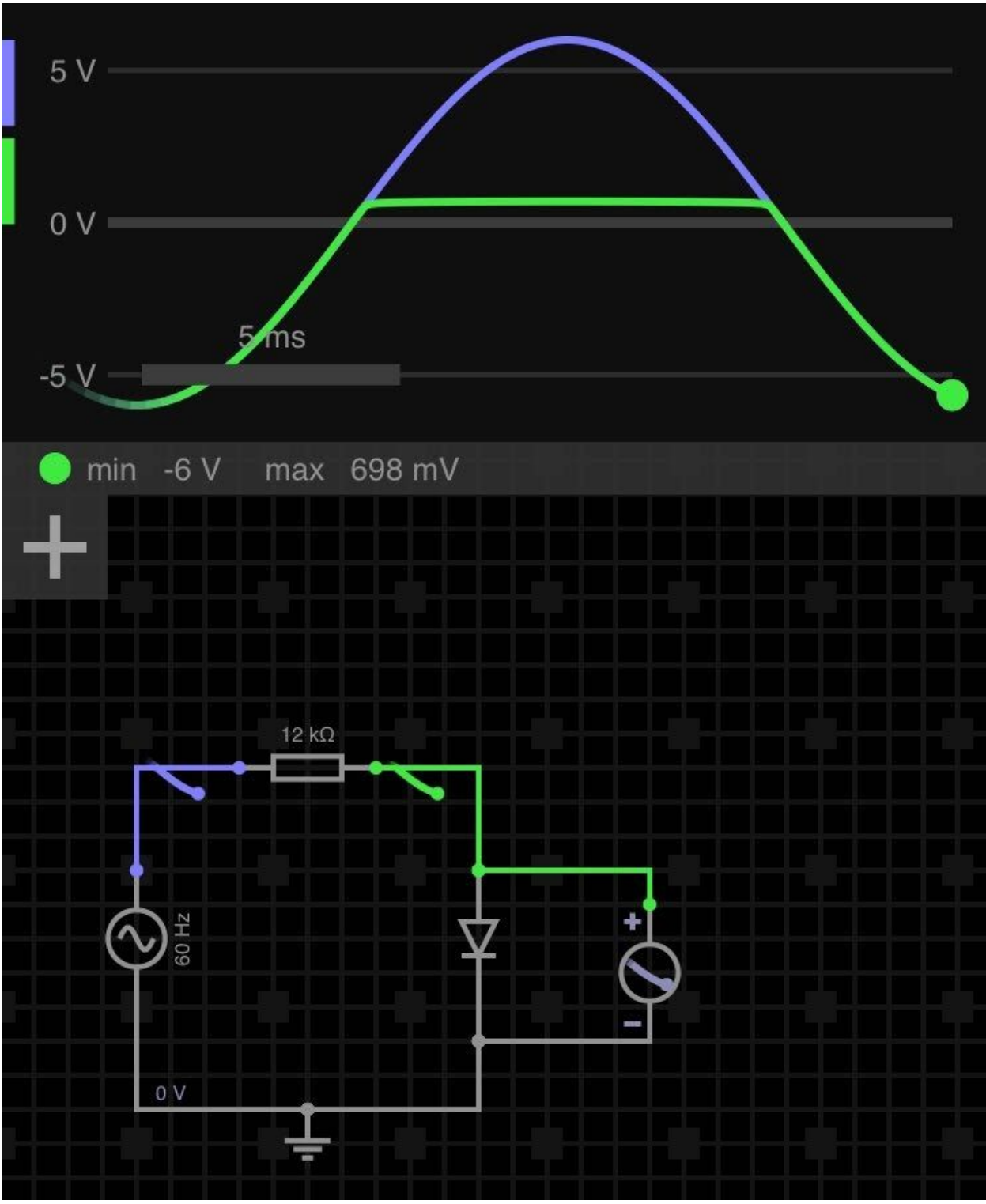


2. By using oscilloscope, measure the output voltage at the terminal of power supply. VMAX: 6V , VRMS: 4.2V
3. Graph the waveform produced. Include its scaling parameter per division.



4. By using oscilloscope, measure the output voltage at the V_{out} terminal.

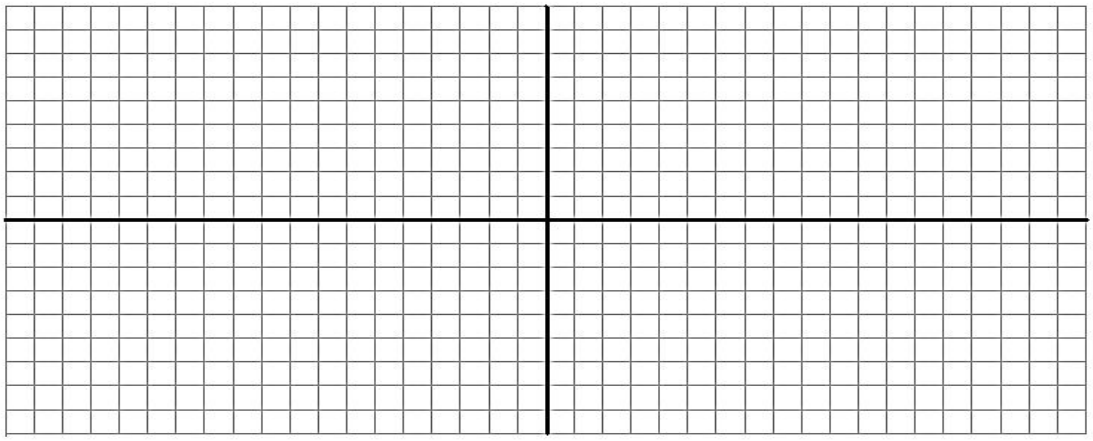
5. Graph the waveform produced. Include its scaling parameters per division.



6. Interchange the connection of the 1N4001 diode.

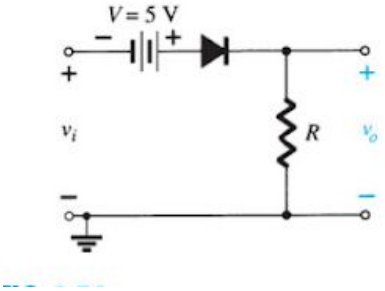
   Terminal of Power supply = 4.2V

7. Repeat steps 6 & 7.



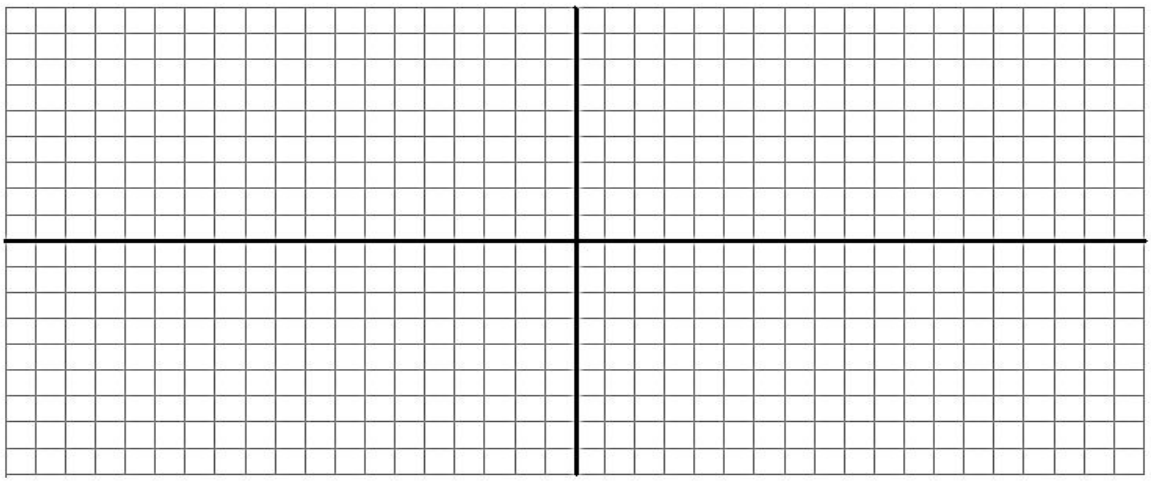
II. Circuit B (Series Clipper)

1. Construct the circuit as shown. Set Vi=6Vrms 60Hz, Vdc=2V and R=12kΩ.



2. By using oscilloscope, measure the output voltage at the V_{out} terminal.

3. Graph the waveform produced. Include its scaling parameters per division.



III. Circuit C (Parallel Clipper)

1. Construct the circuit as shown. Set Vi=6Vrms 60Hz, Vdc=4V and R=12kΩ

2. By using oscilloscope, measure the output voltage at the V_{out} terminal.
3. Graph the waveform produced. Include its scaling parameters per division.

IV. DISCUSSION: Clipper circuits are used to clip off unwanted portion of the waveform,without distorting the remaining part of the waveform. The half wave rectifier is the best and simplest type of clipper circuit which clips off the negative portion of the input signal.

V. OBSERVATION: The diode is forward biased during the negative half cycle of the sinusoidal waveform and limits or clips it to –0.7 volts while allowing the positive half cycle to pass unaltered when reverse biased. As the diode limits the negative half cycle of the input voltage it is therefore called a negative clipper circuit.

VI. CONCLUSION:In this experiment understand the operating principle of diode clipping andclamping circuit. In positive diode clipping circuit a diode clipper that limits orclips the positive part of the input voltage. As the input voltage goes positive,the diode becomes forwards-biased and conduct current. It is because thecathode is at ground potential (0 v), the anode 0.7v(assuming silicon). So thedrop at D1 is limited to +0.7v when the input exceeds this value.