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# EE4035 Electronics Laboratory Week-V

## Limiting and Clamping Circuits

PART-I

CLIPPER CIRCUIT

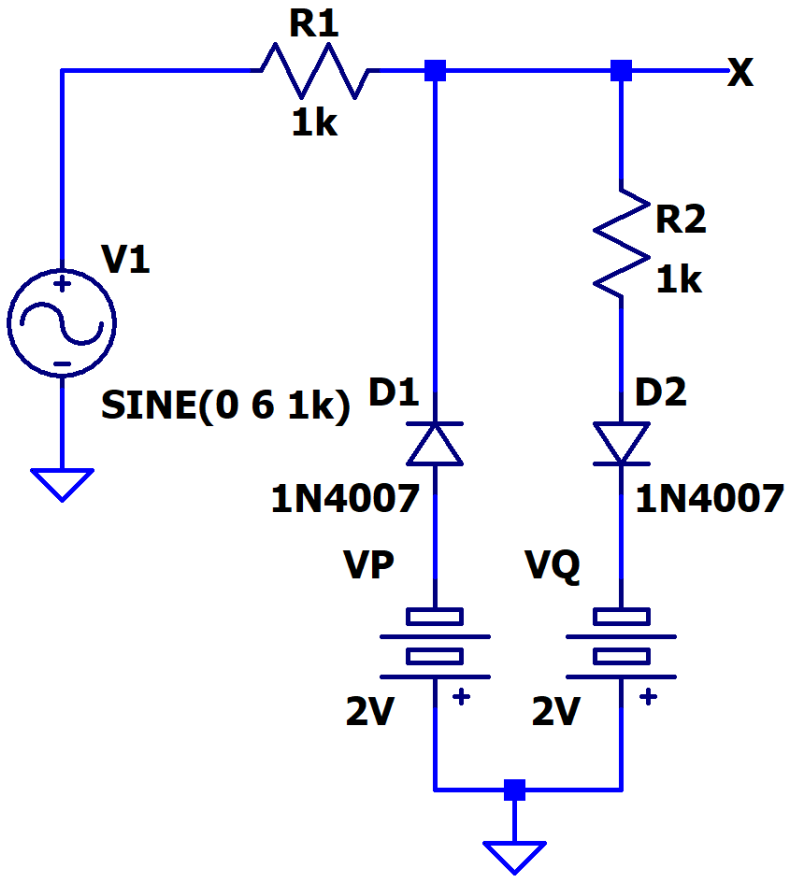


**Figure 1.** Circuit Diagram - Clipper Circuits

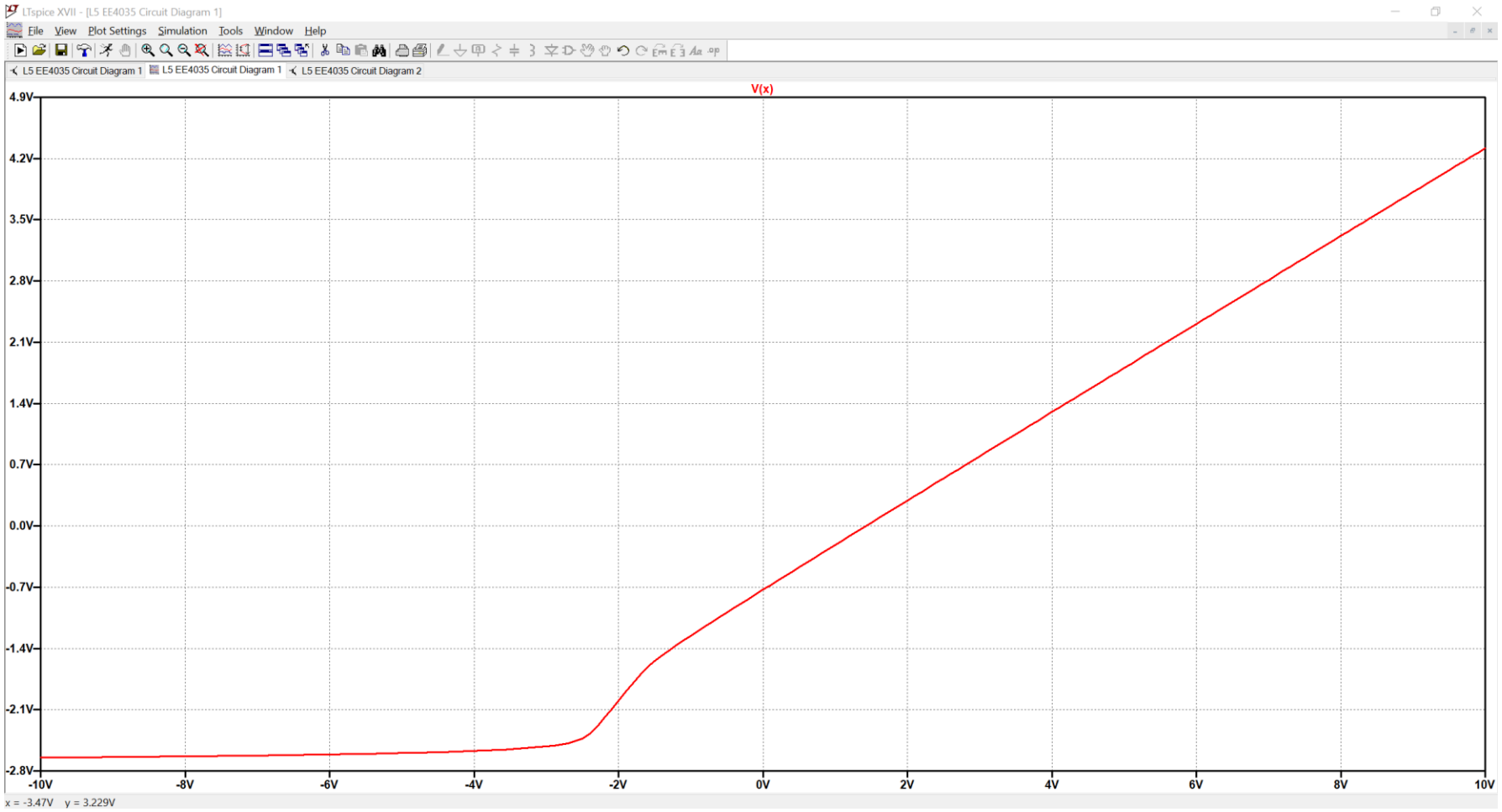


**Figure 2.** Voltage Transfer Characteristics

***Input DC Sweep from -10V to 10V In Increments of 0.1V**

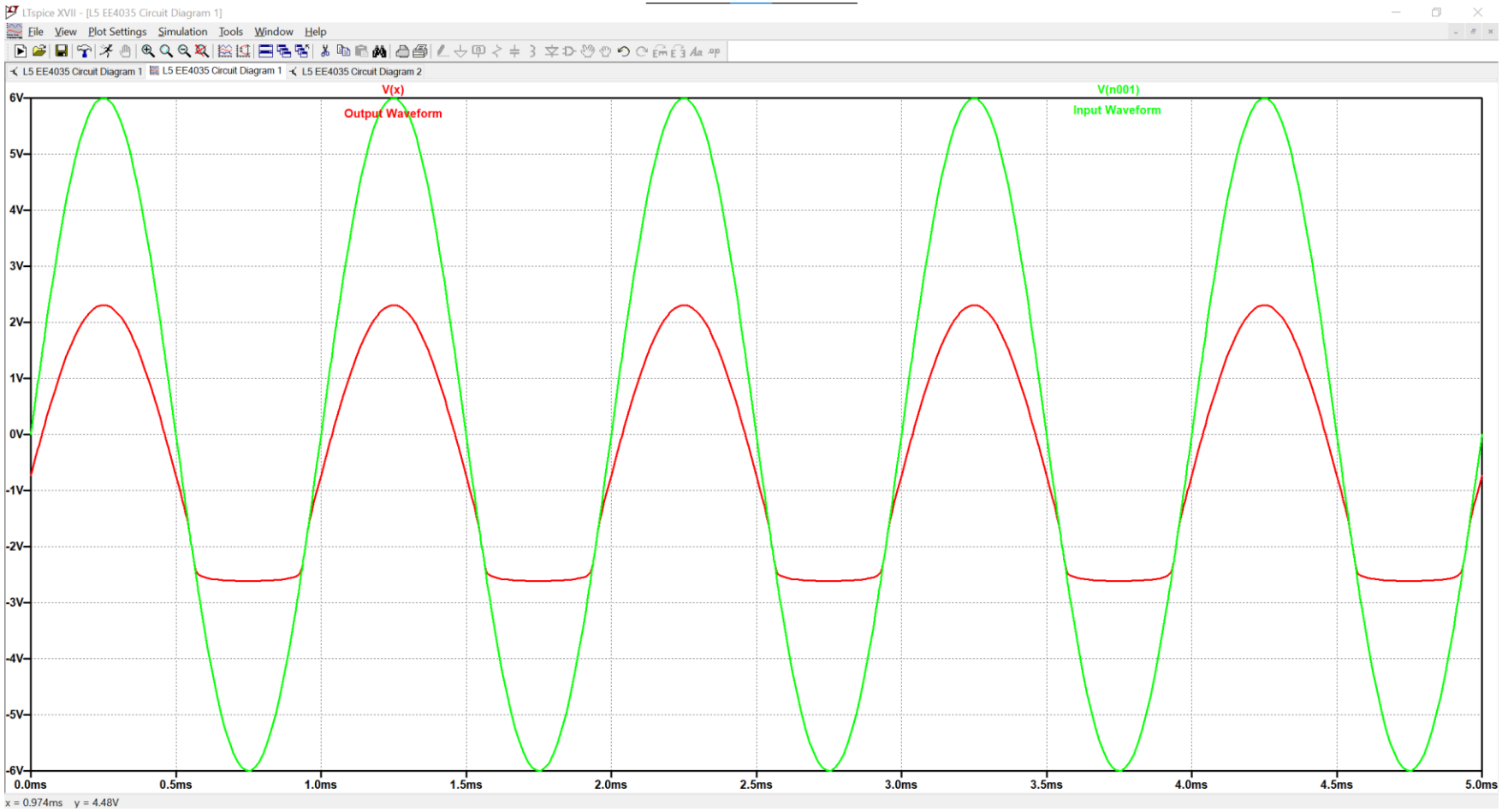


**Figure 3.** Output Waveform

CLAMPER CIRCUIT

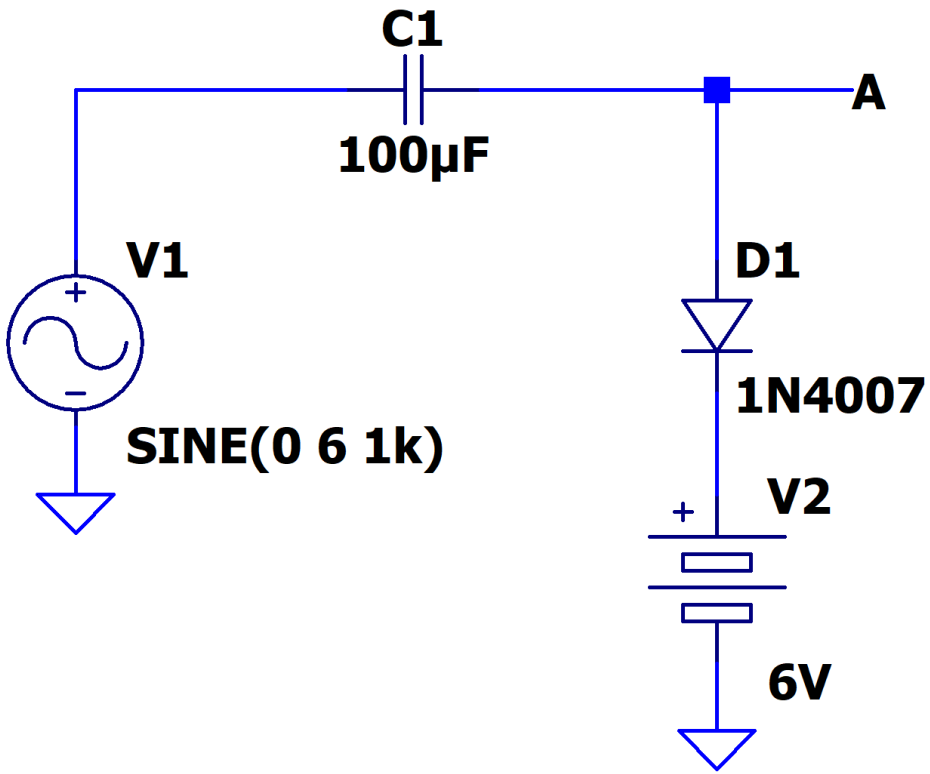


**Figure 4.** Circuit Diagram - Clamper Circuit

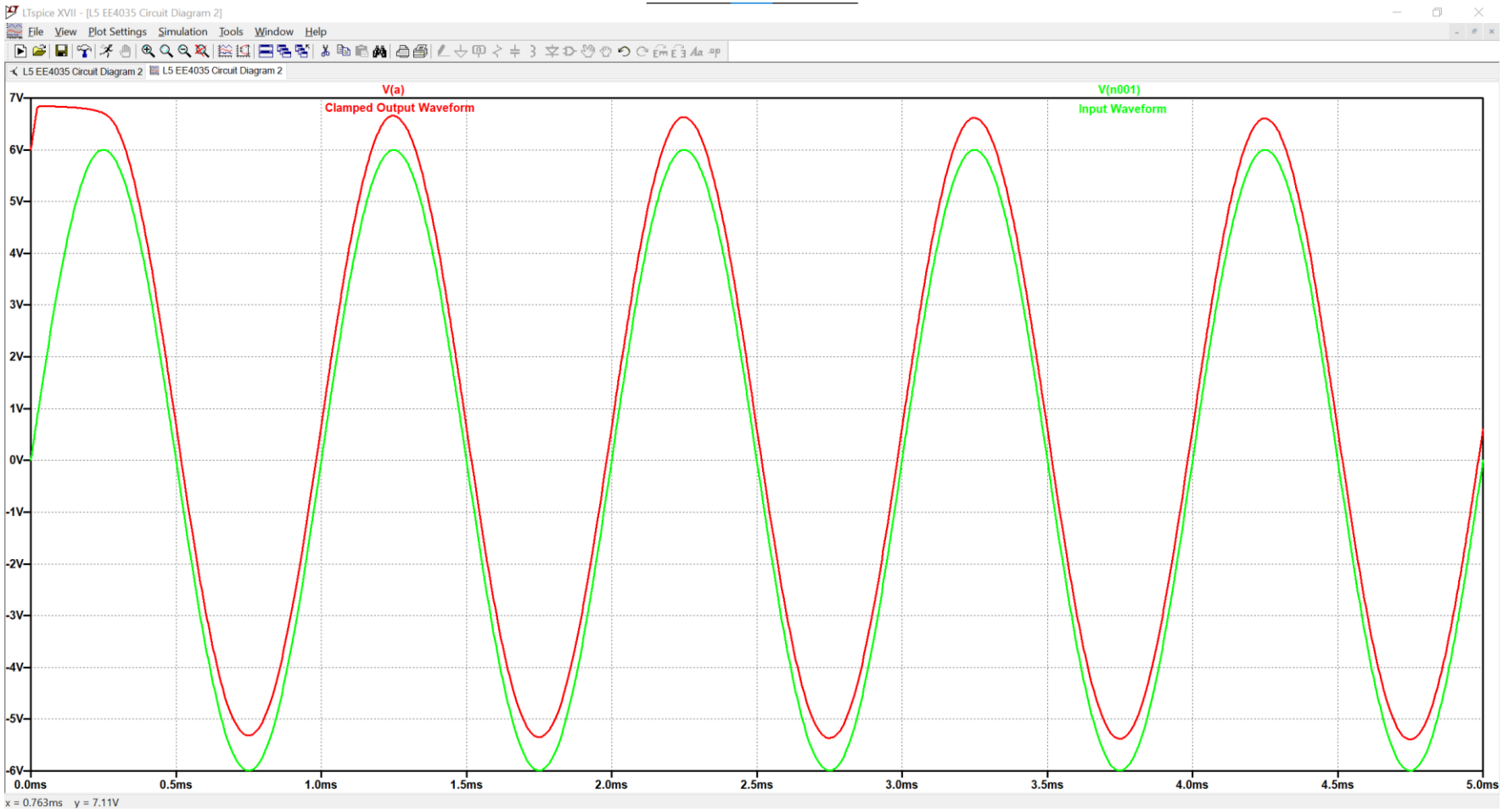


**Figure 5.** Output Waveform

PART-II

1. Connect the circuit as shown in **Figure 1** with $V_P$ and $V_Q$ as -2V with both resistance as 1kOhms and input as 6V sine wave with frequency 1kHz. Plot the output waveform and VTC of the circuit. **Refer Figure 1 to Figure 3**.

2. Connect the circuit as shown in **Figure 2** with input voltage 6V with frequency 1kHz and capacitance as 10uF and use diode D1 1N4007. Plot the waveform for the following potentials 0V, 2V and -2V.

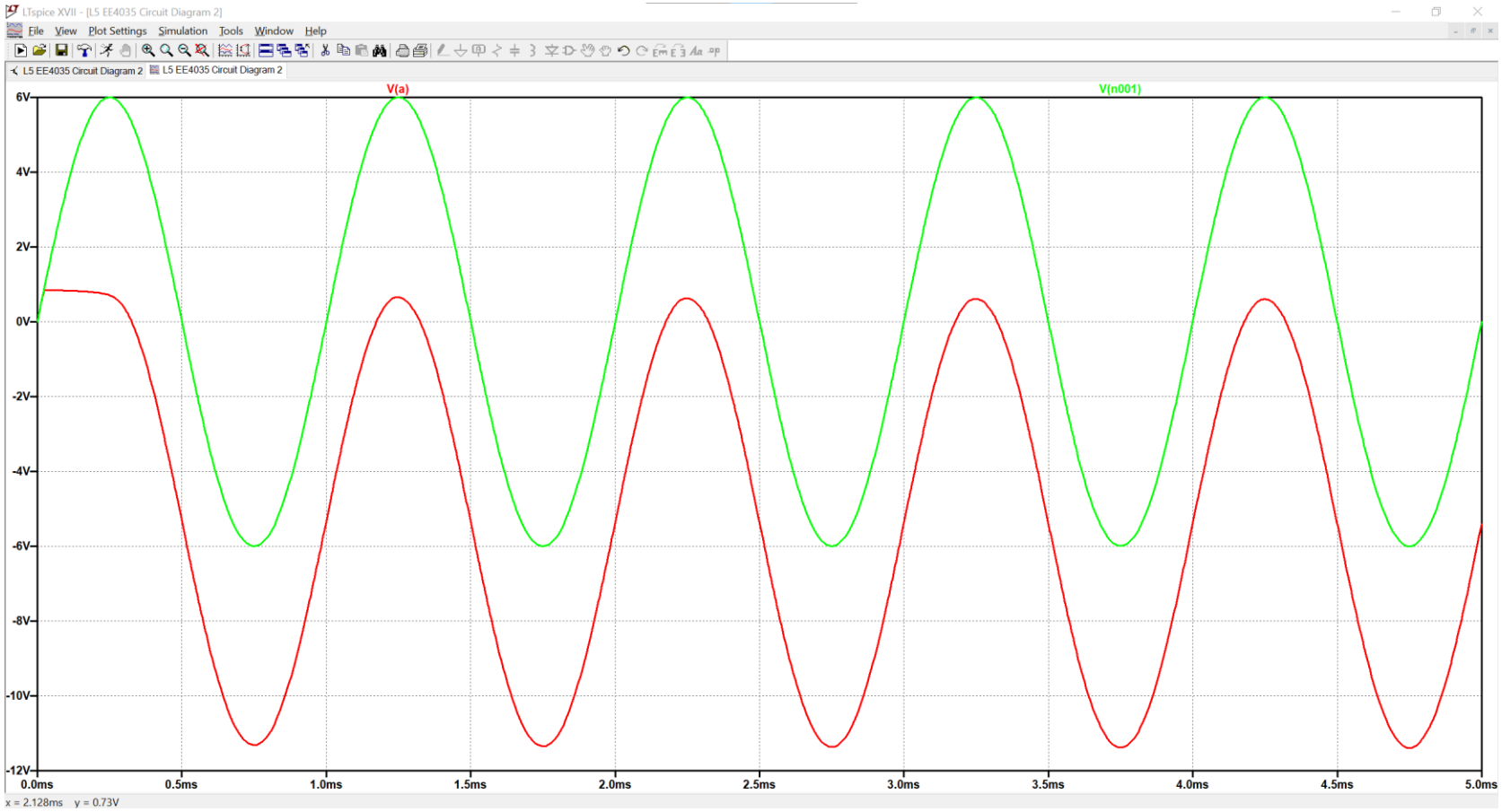


**Figure 6.** Output Waveform with **0V** Potential

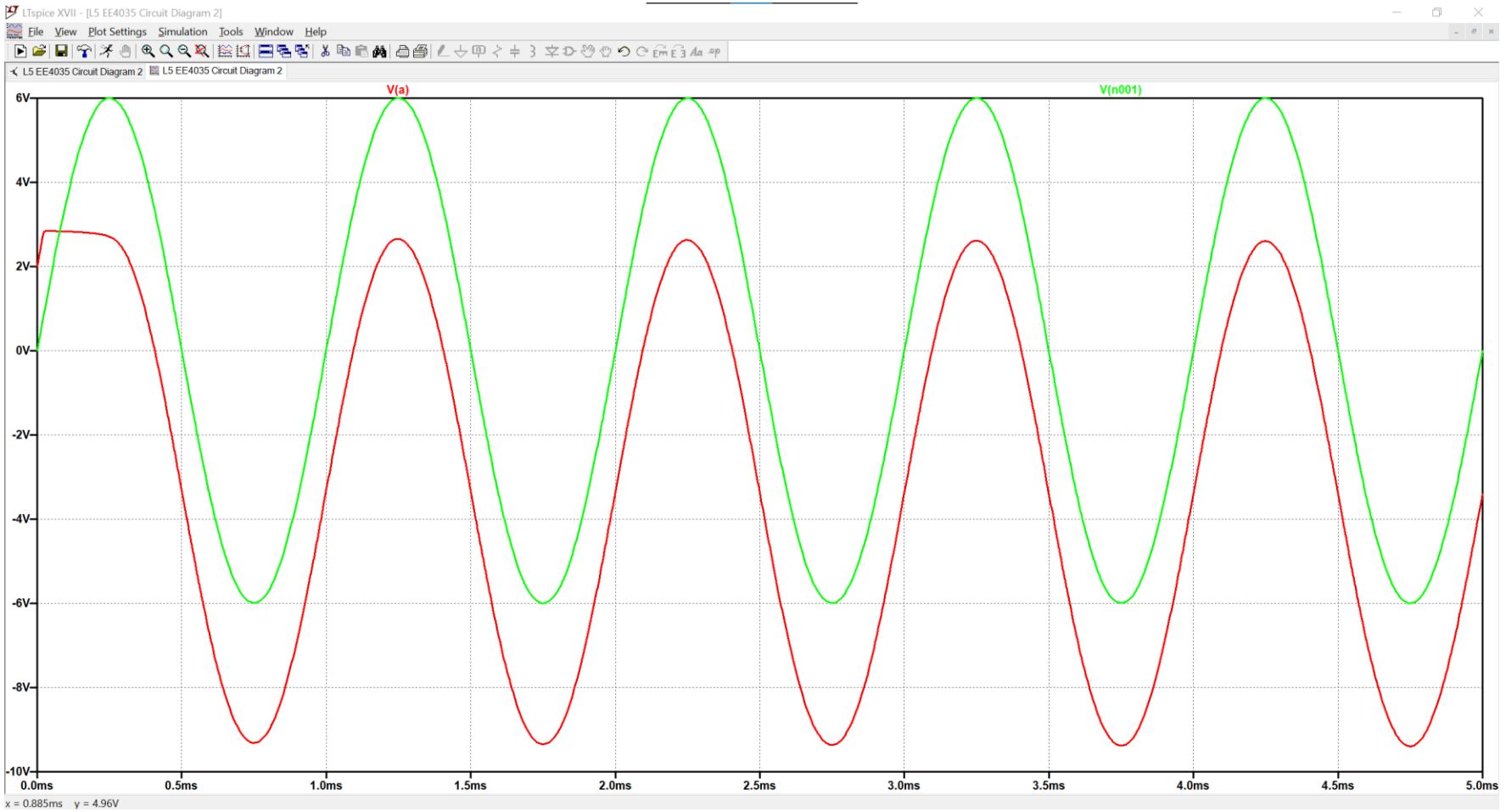


**Figure 7.** Output Waveform with **2V** Potential

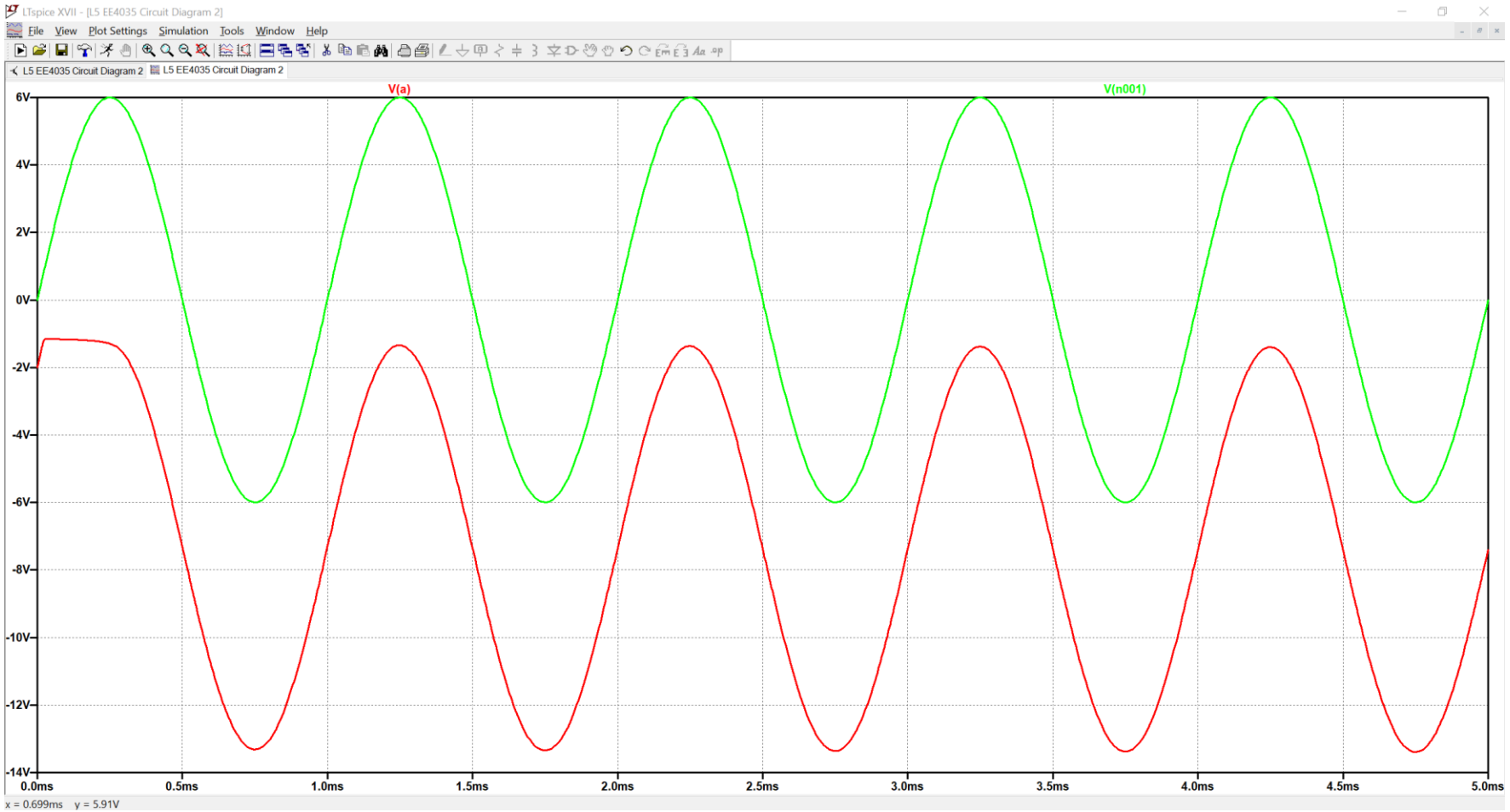


**Figure 8.** Output Waveform with **-2V** Potential

PART-III

1. In **Figure 1** if the diode D1 is reversed, with all other values remaining the same, how is the VTC of the circuit will change?
2. In **Figure 1** if the resistances are change to 100 Ohms, will the circuit behave differently?
3. In **Figure 4** (Clamper Circuit), if a resistor of 100kOhms were to be introduced in series with D1, how will the output change?

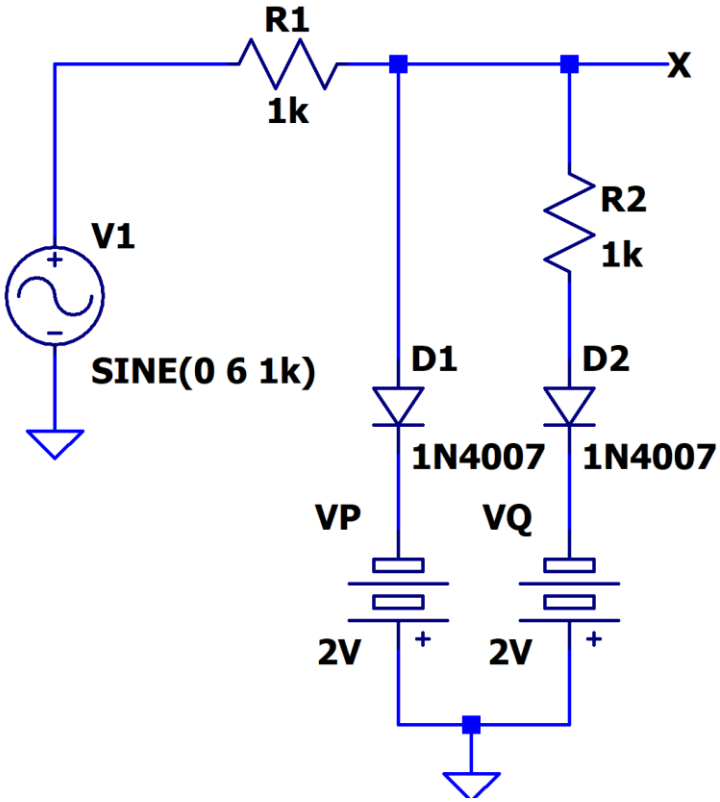


**Figure 9.** Circuit Diagram - Clipper Circuit with Diode Potential Reversed

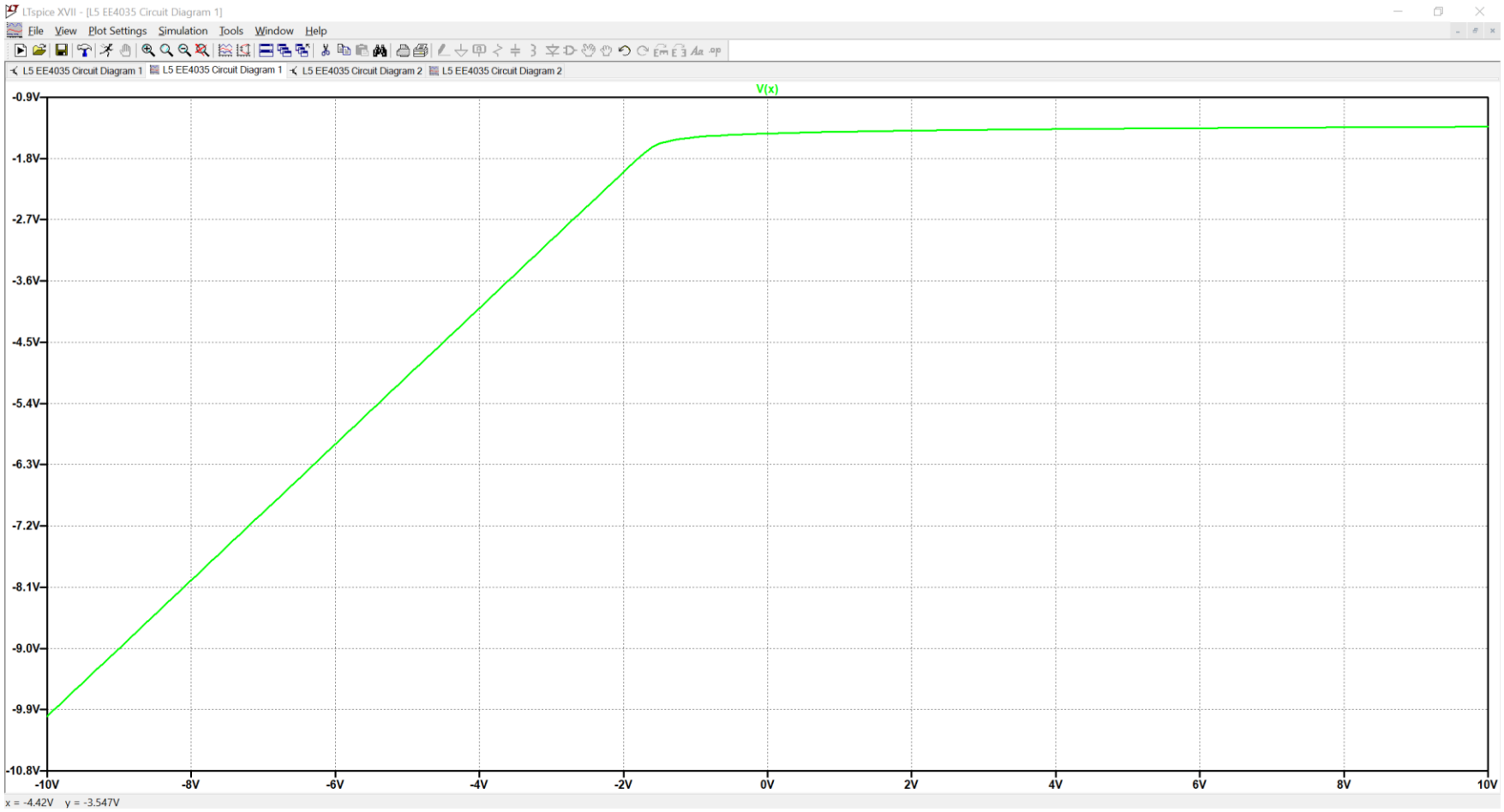


**Figure 10.** Voltage Transfer Characteristics - Diode D1 Reversed Circuit

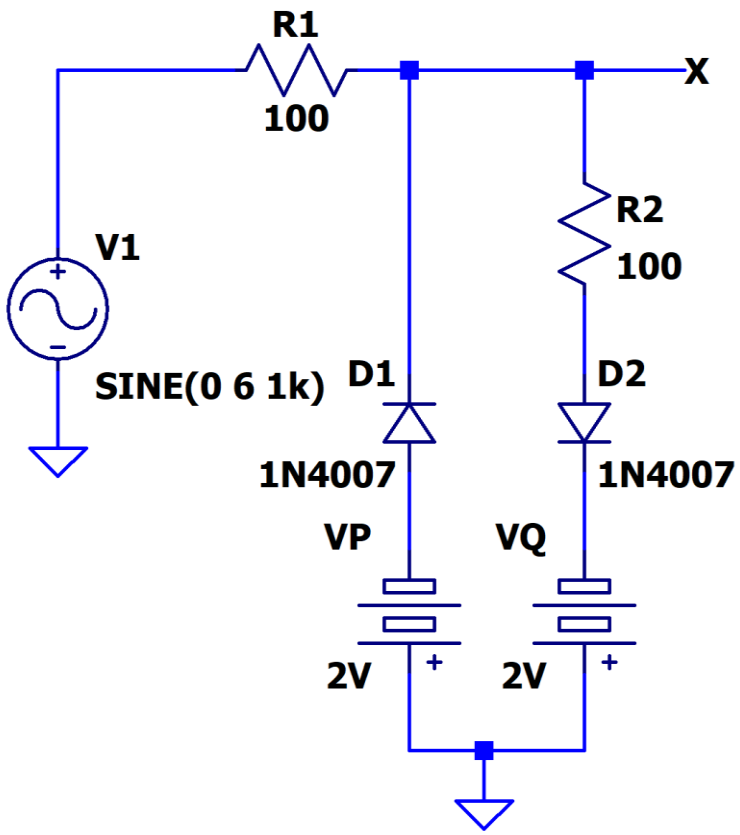


**Figure 10.** Circuit Diagram - Clipper Circuit Resistance Altered

**Interference**

For the above circuit, with the prescribed changes in the resistance both the voltage transfer characteristics and output waveform remained unchanged. From this, it can be concluded that the resistances only act as power or voltage limiters for diodes.

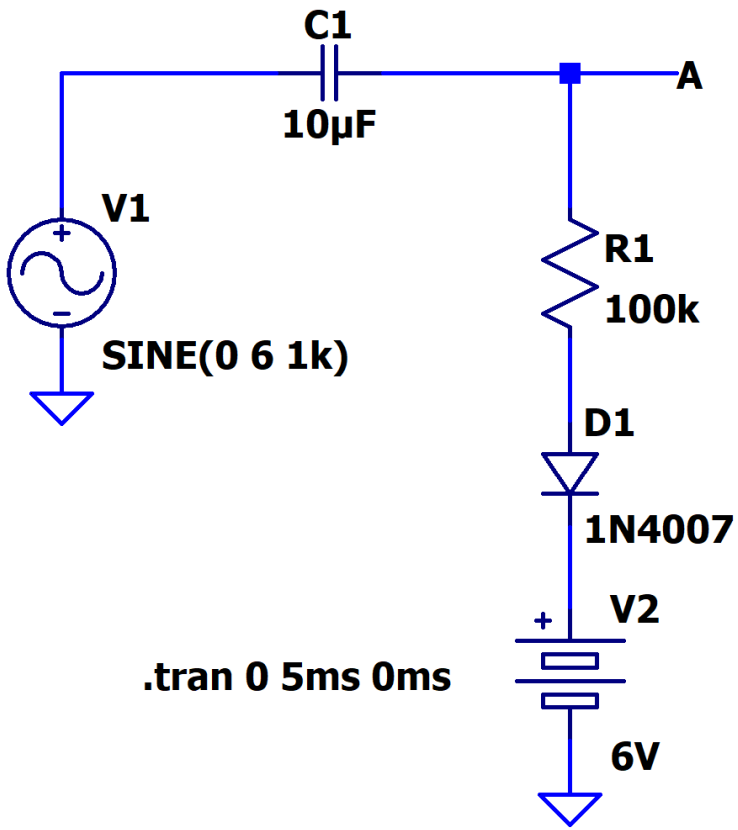


**Figure 11.** Circuit Diagram - Clamper Circuit with Series Resistance

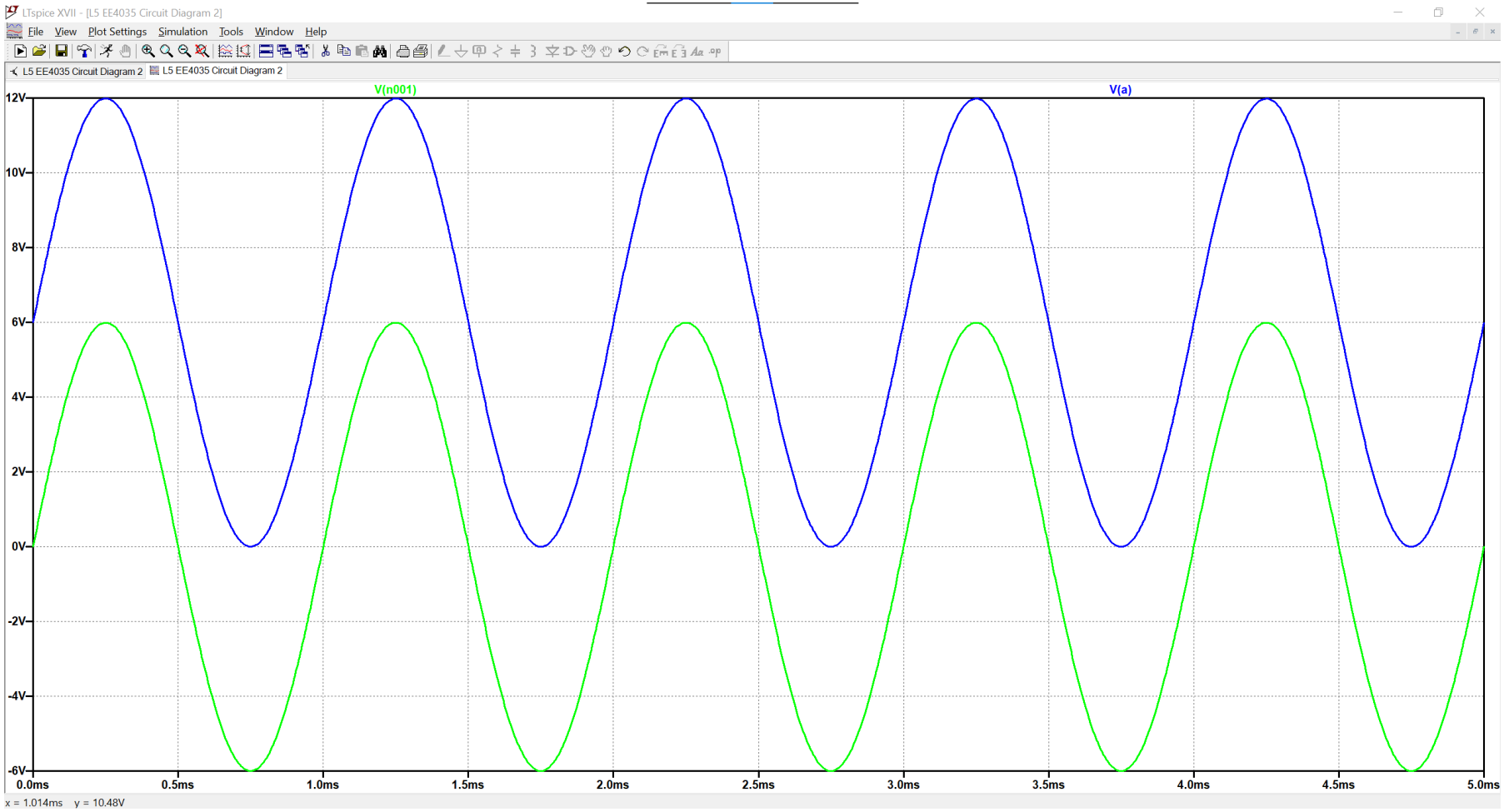


**Figure 12.** Output Waveform

## Interference

For the above circuit, when a series resistance is added the time constant of the circuit decreases and the circuit becomes more responsive and the initial voltage surge seen in Figure 5 is avoided.