**Lab – Diode Clipping/Limiting Circuits**

**Objectives**

-To examine diode limiting/clipping circuits

-To calculate and measure the voltage limits of both biased and unbiased limiting circuits

-To predict and measure the effect of DC bias voltage on a clipping circuit

**Equipment and Materials Needed:**

-DC Regulated Power Supply or Powered Breadboard

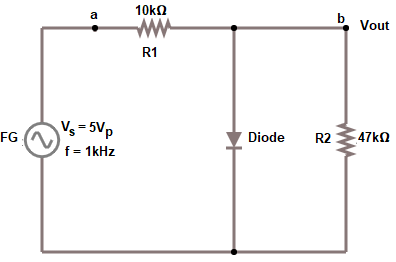
-A function generator, an oscilloscope and 3 BNC cables; Digital Multi-meter

-Resistors: 5 k, 10 k, 47 k

-Two signal diodes: 1N914 (or equivalent); One 47 F capacitor

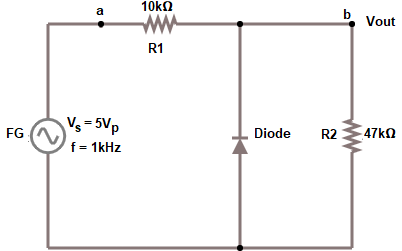
**Activity 1- Application of Diodes: Diode Clippers**

Build the circuit shown in figure 1 below.



*Figure 1- Diode Clipper[[1]](#endnote-1)*

1. Connect the function generator to the circuit and set the amplitude to 5 Vpeak and the frequency to 1000 Hz.
2. Use Ch1 of the oscilloscope to measure the signal from the function generator. Connect the red cable from Ch1 to point ‘a’ on the circuit and the black cable goes to ground. This is the input signal.
3. Use Ch2 of the oscilloscope to measure the signal across R2. Connect the red cable from Ch2 and place it at point ‘b’ (Vout). The black cable goes to ground.
4. Notice the zero volt level. Sketch the input and output waveforms in your notebook (you can also take a picture of the waveforms and put them in a word document). Measure the waveform across R2. Use the ‘CURSOR’ on the scope to measure the voltage peaks for Vout.
5. Repeat steps 1-4 for the circuit shown in figure 2.



*Figure 2- Diode Clipper*

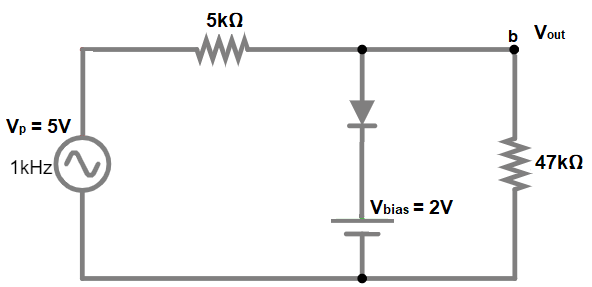
**Question** 1: In what way, are the output signals from figures 1 and 2 different? Briefly describe differences. Neatly draw the waveforms seen on the oscilloscopes in your notebook.

**Activity2 - Biased Diode Clipper**

6. Remove the cathode of the diode from ground and connect it to the DC power supply as shown in Figure 3. **Note:** If you are using the DC Variable Power Supply on the breadboard then just connect a cable from the red terminal of the supply to the cathode of the diode to set up the circuit shown in the figure below. The power supply on the breadboard is internally grounded.

7. Use Ch2 of the oscilloscope to measure the signal across the 47 kOhm resistor. The red cable should be connected to point b in the circuit and the black cable to ground.

8.Set the DC power supply in your circuit to 2V. This DC voltage is called the *bias voltage*. Vary this voltage and observe how the signal waveform changes on the oscilloscope. Describe your observations.



*Figure 3- Biased Diode Clipper*

1. All schematic diagrams were created with Falstad circuit simulator (https://falstad.com/circuit/) [↑](#endnote-ref-1)