EE230- Analog lab (Experimental Results: Lab session-3)
Spring Semester: Year 2021-22

January 27, 2022

Experimental Results:

1. **Inverting Amplifier**

   (a) Frequency response for the amplitude of $0.1V$ and frequency range of $10Hz$ to $10MHz$ with $R_1 = 1k\Omega$, $R_2 = 10k\Omega$ in the figure [1].

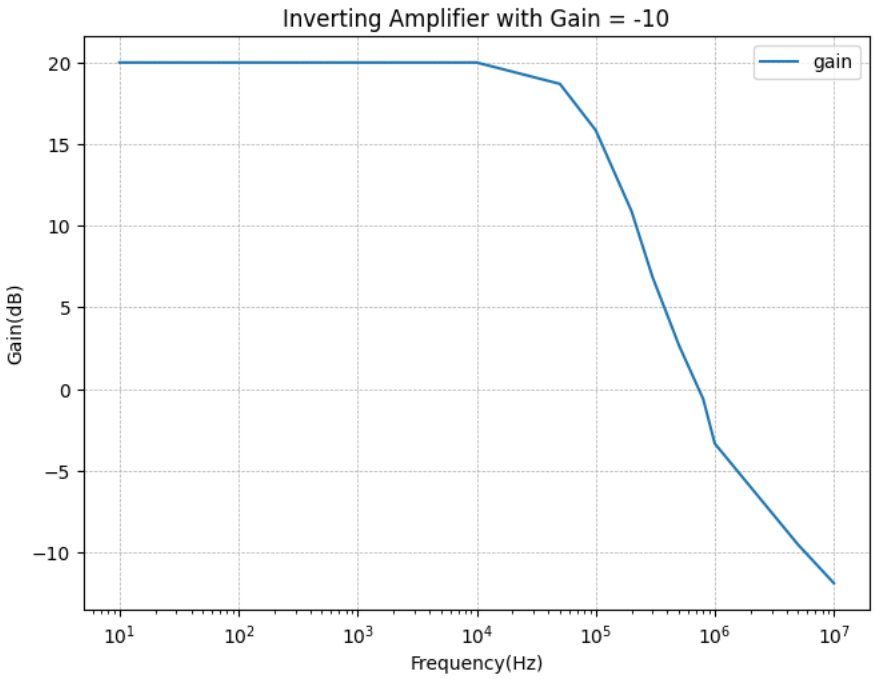

Figure 1: Inverting Amplifier- Frequency response with $Gain = -10$

(b) Frequency response for the amplitude of $0.1V$ and frequency range of $10Hz$ to $10MHz$ with $R_1 = 1k\Omega$, $R_2 = 100k\Omega$ in the figure [2].

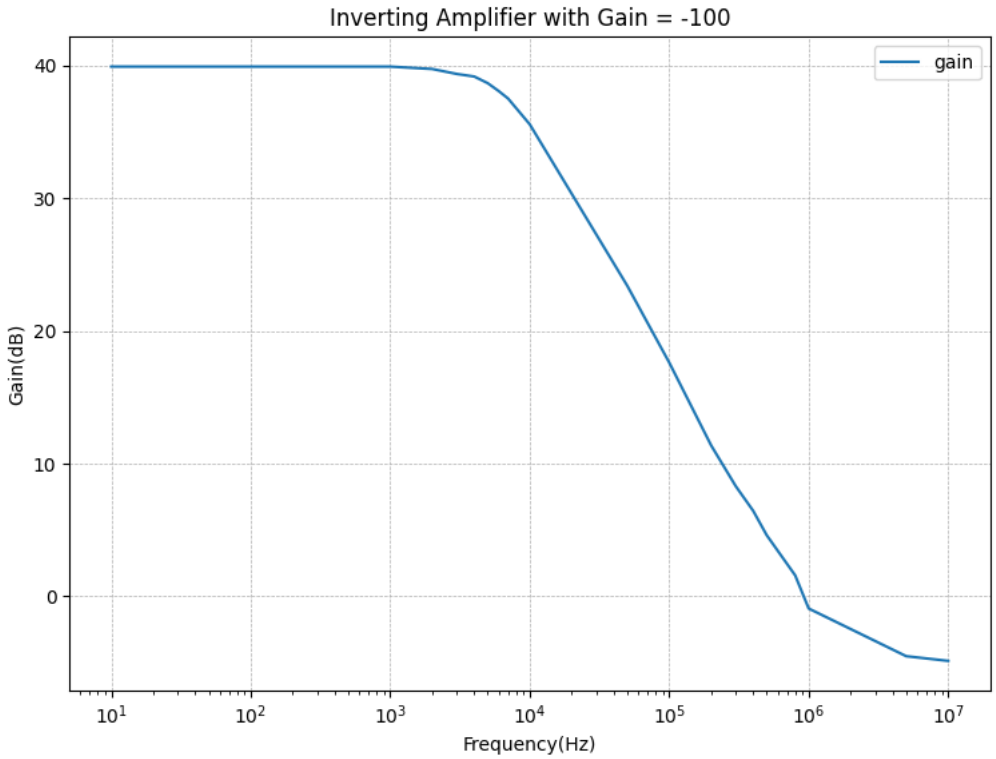

Figure 2: Inverting Amplifier- Frequency response with $Gain = -100$

2. **Non-inverting Amplifier**

(a) Frequency response for the amplitude of $0.1V$ and frequency range of $10Hz$ to $10MHz$ with $R_1 = 1k\Omega$, $R_2 = 10k\Omega$ in the figure [3].

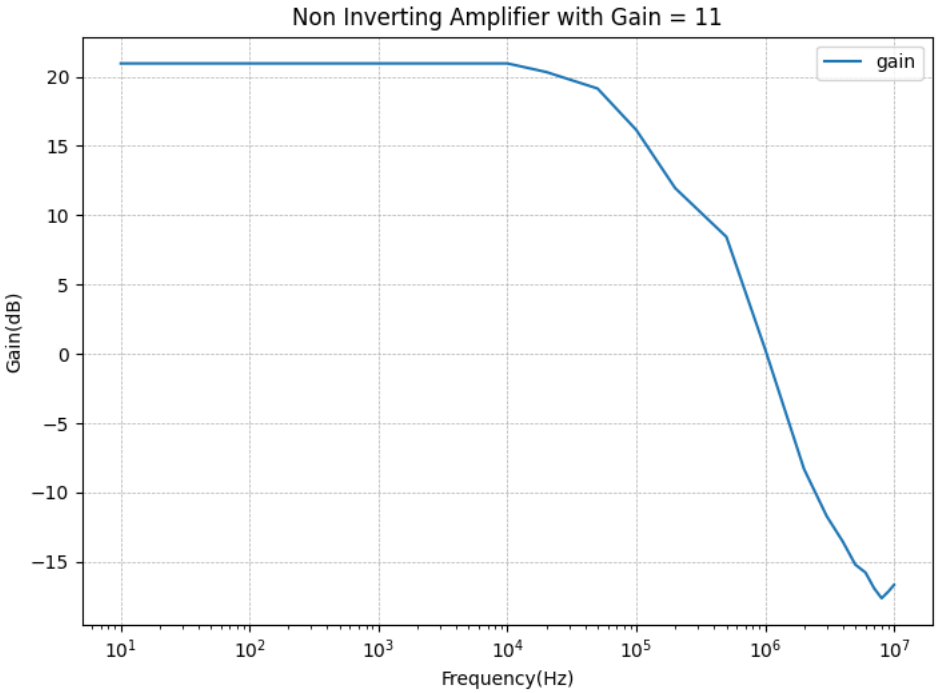

Figure 3: Non-Inverting Amplifier- Frequency response with $Gain = 11$

(b) Frequency response for the amplitude of $0.1V$ and frequency range of $10Hzto10MHz$ with $R_1 = 1k\Omega$, $R_2 = 100k\Omega$ in the figure [4].

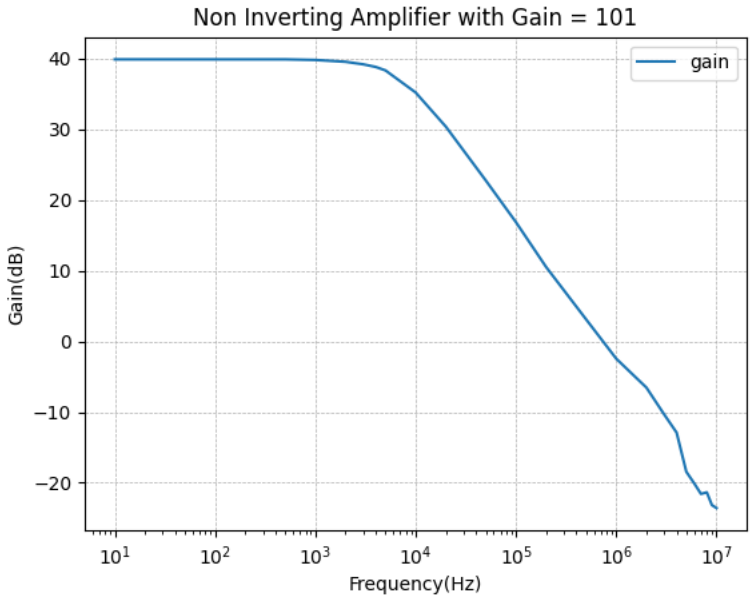

Figure 4: Non-Inverting Amplifier- Frequency response with $Gain = 101$

3. **Integrator**

   (a) Integrator experimental circuit in the figure [5].

   (b) Output waveform with $R = 10k\Omega$, $C = 0.01\mu F$, $R' = 470k\Omega$ in the figure [6].

   (c) Integrator- Output waveform with $R = 10k\Omega$, $C = 0.01\mu F$, $R' = 470k\Omega$ on a Digital Storage Oscilloscope (DSO) in the figure [7].

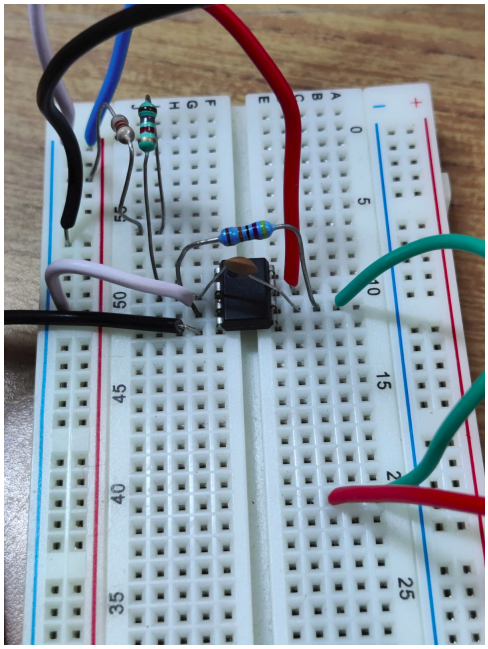

Figure 5: Integrator Circuit- Assembled on a breadboard

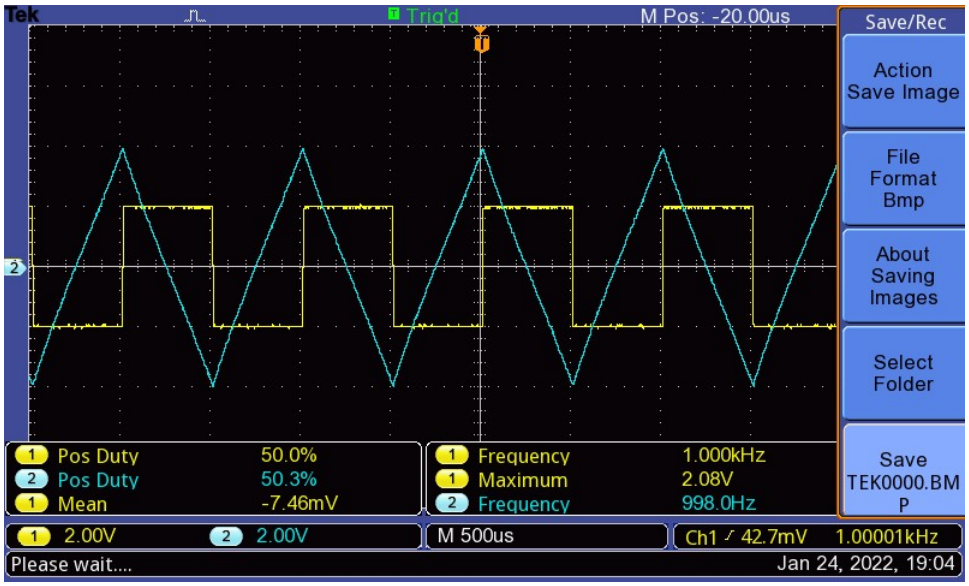

Figure 6: Integrator- Output waveform captured through a DSO

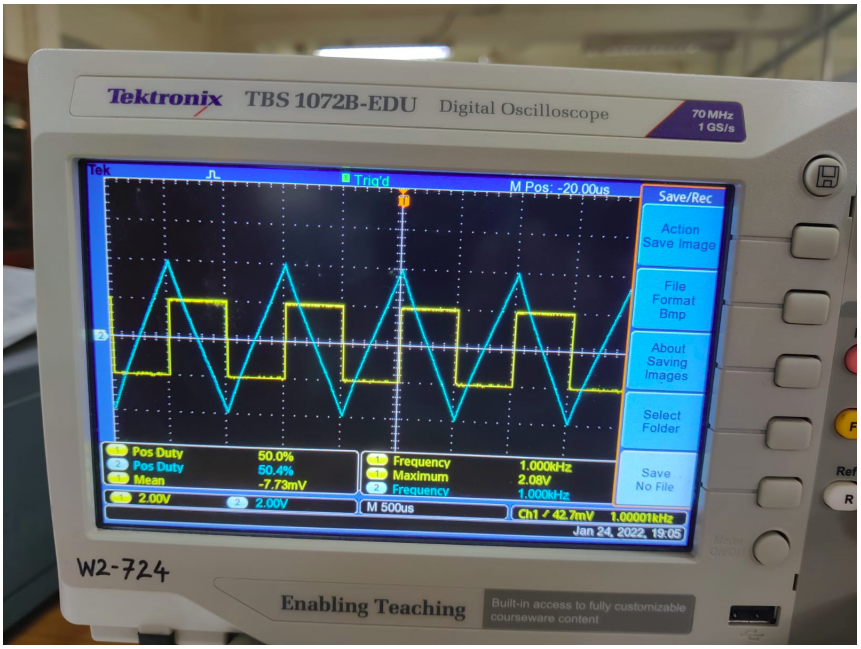

Figure 7: Integrator- Output waveform on a DSO

4. **Differentiator**

   (a) Output waveform with $R = 10k\Omega$, $C = 0.01\mu F$ in the figure [8].

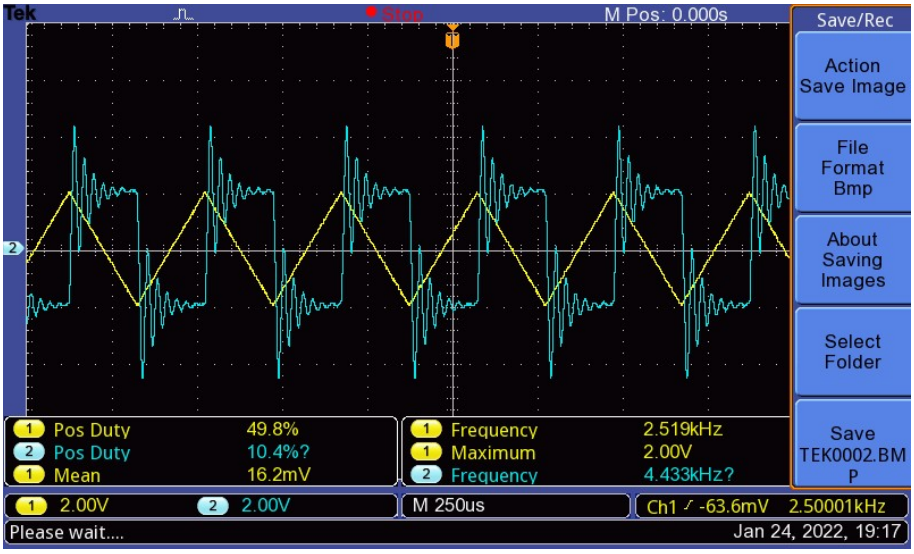

Figure 8: Differentiator- Output waveform without Feedback Capacitor

(b) Differentiator circuit with Feedback Capacitor in the figure [9].

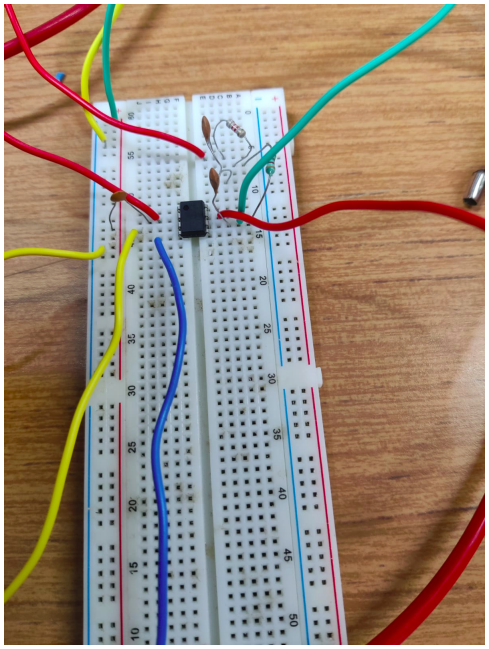

Figure 9: Differentiator circuit with Feedback Capacitor

(c) Output waveform with $R = 10k\Omega$, $C = 0.01\mu F$ and $C' = 0.001\mu F$in the figure [10].

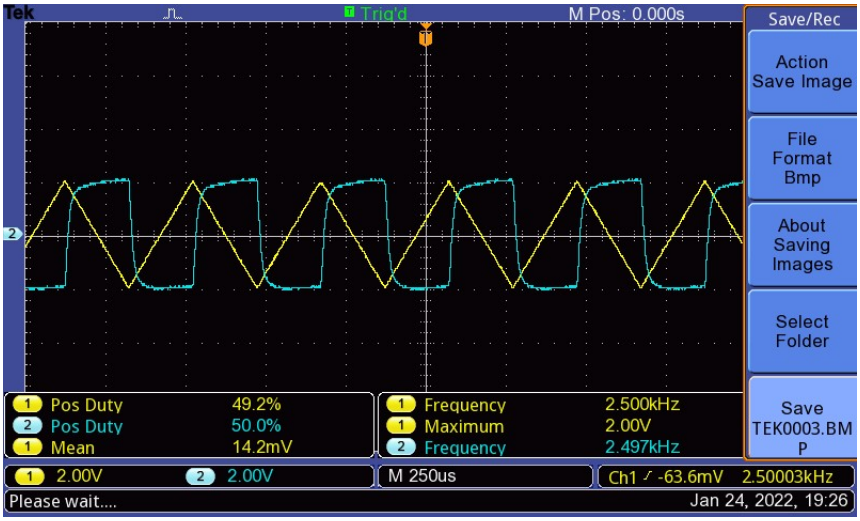

Figure 10: Differentiator- Output waveform with Feedback Capacitor

5. **Rectifier Circuits**

(a) Rectifier Circuit in the figure [11].

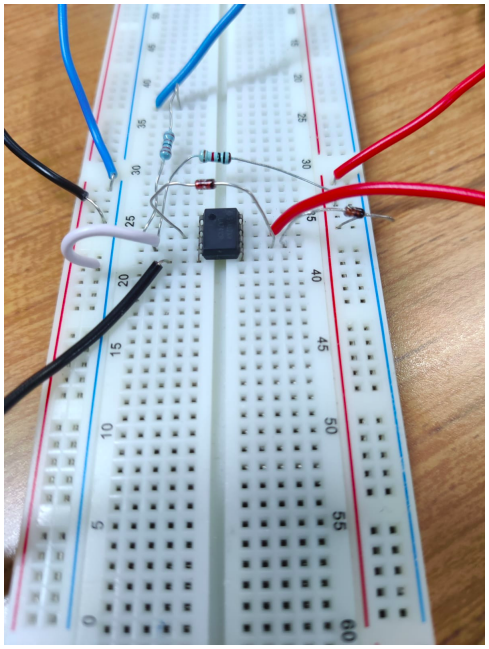

Figure 11: Rectifier Circuit- assembled on a breadboard

(b) Input to Rectifier Circuit applied through Arbitrary Function Generator (AFG) in the figure [12].

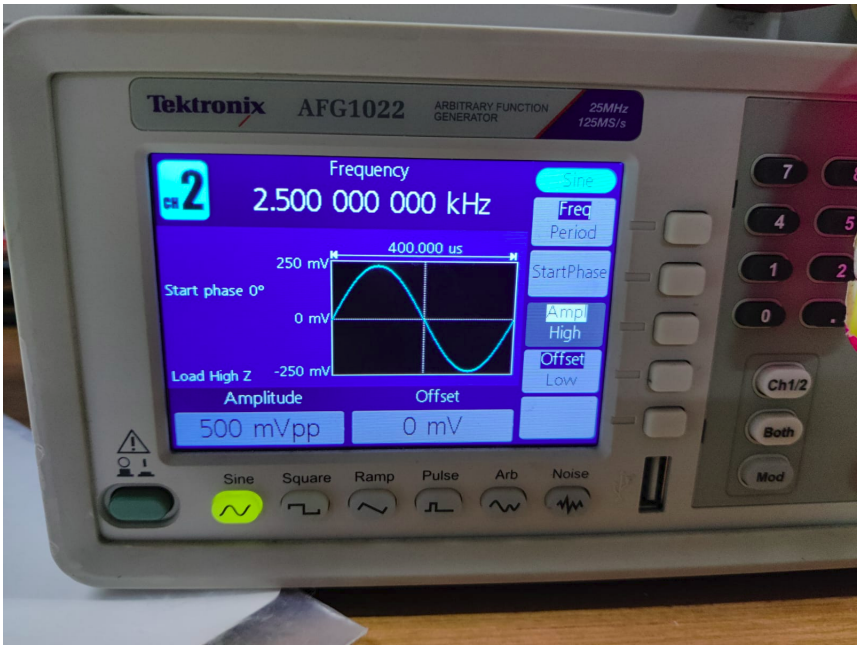

Figure 12: Input to rectifier circuit through AFG

(c) Improved Half-wave Precision Rectifier_A- Output waveform in the figure [13].

(d) Improved Half-wave Precision Rectifier_B- Output waveform in the figure [14].

(e) Full-wave Precision Rectifier- Output waveform in the figure [15].

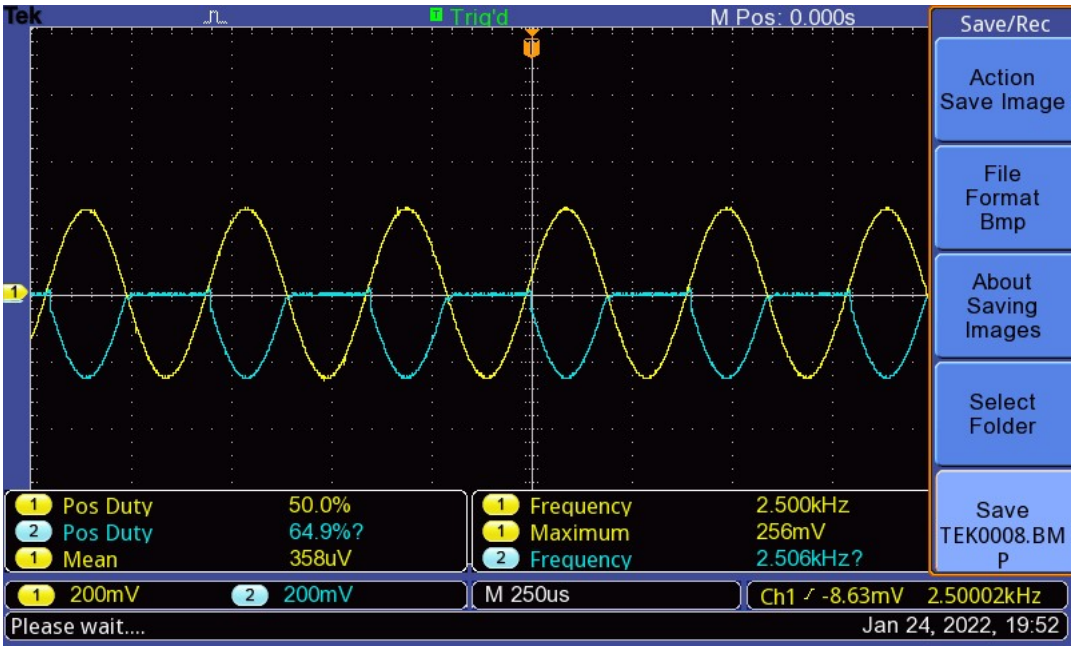

Figure 13: Output waveform- Improved Half-Wave Rectifier-A

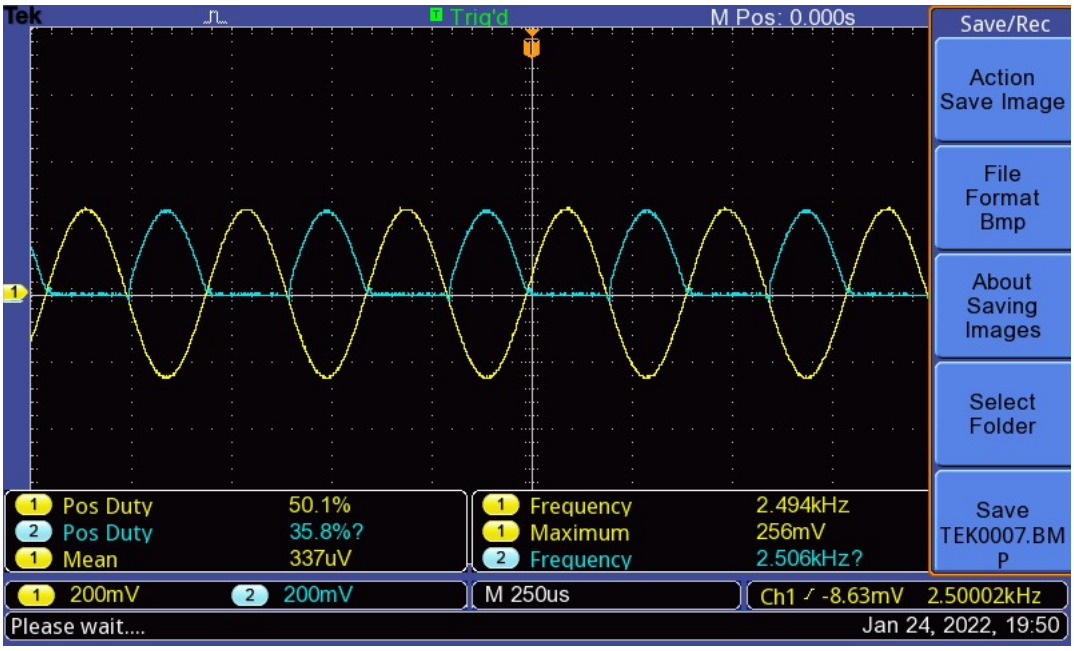

Figure 14: Output waveform- Improved Half-Wave Rectifier-B

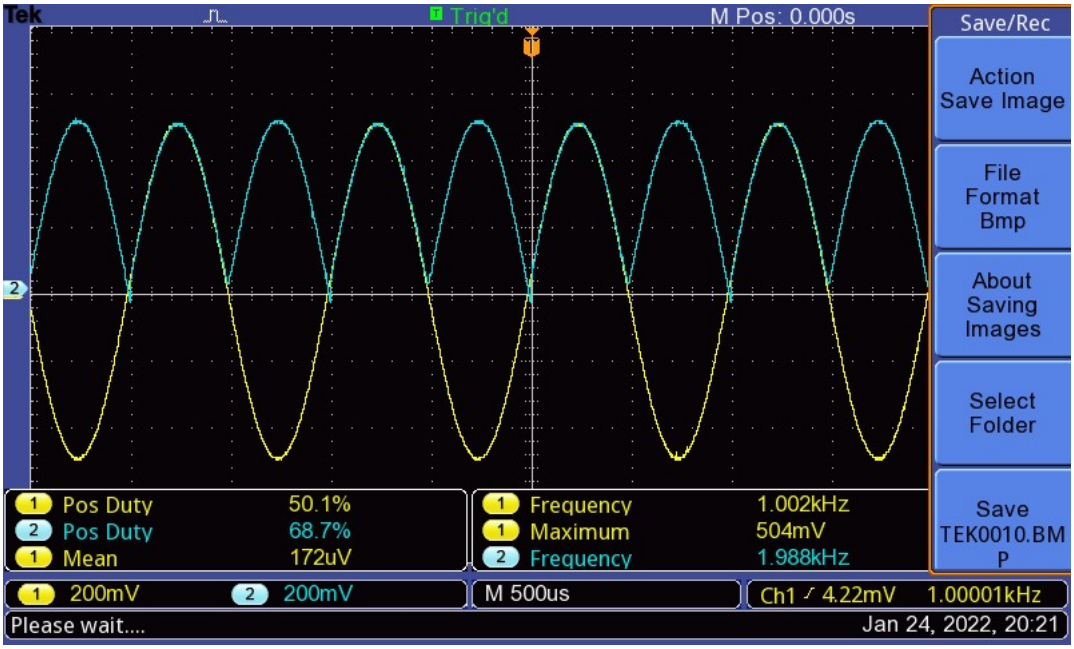

Figure 15: Output waveform- Full-wave Rectifier