

Lab 2

Rectifiers, Filters, and Ripple

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Objective

- Construct half and full-wave rectifiers
- Investigate use of capacitor filters to reduce ripple
- Demonstrate how loading of power supplies affects ripple
- Demonstrate the use of RC-pi filters to reduce ripple

Results

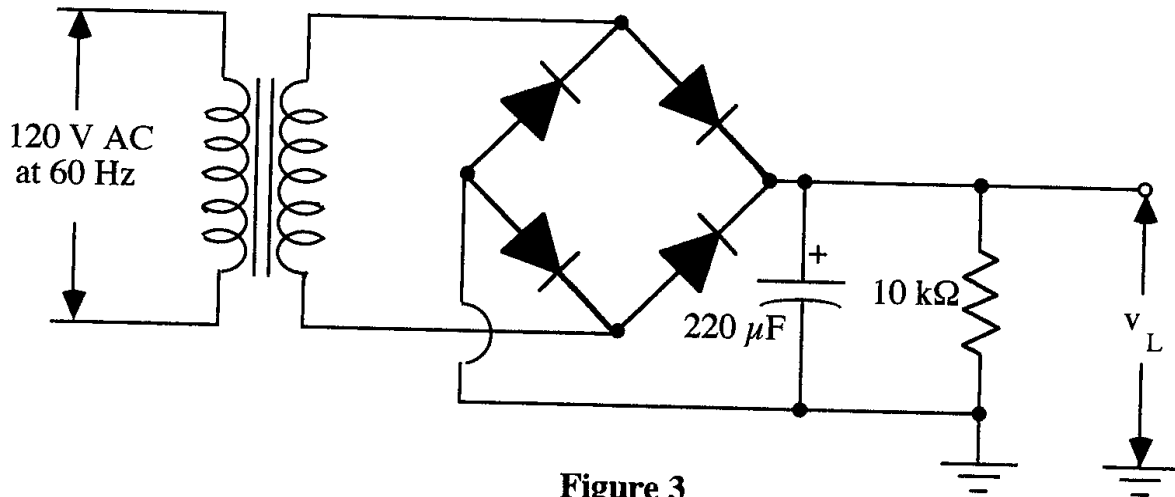


Figure 3

Replacing the 220uF cap with 440uF, $V_{pp} = \sim 40\text{mV}$ and $V_{avg} = 8.3\text{V}$

Analysis

Using a proper configuration of diodes, a rectifier circuit can be constructed that converts an AC signal into DC bursts (with some peak-to-peak ripple).

This ripple can be decreased with the use of a capacitor filter in parallel with the load resistance.

Conclusion

Cap filters with a higher capacitance value can improve peak-to-peak voltage consistency over lower capacitance filters.

Half-wave rectifiers simply truncate the negative portion of an AC sine-wave, whereas full-wave rectifiers invert the negative voltage values to positive in an AC sine-wave.