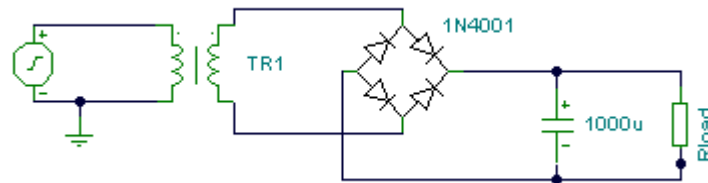


# Unregulated Power Supply

A basic full wave rectified power supply is shown below. The transformer is chosen according to the desired load. For example, if the load requires 12V at 1amp current, then a 12V, 1 amp rated transformer would do. However, when designing power supplies or most electronic circuits, you should always plan for a worst case scenario. With this in mind, for a load current of 1 amp a wise choice would be a transformer with a secondary current rating of 1.5 amp or even 2 amps. Allowing for a load of 50% higher than the needed value is a good rule of thumb. The primary winding is always matched to the value of the local electricity supply.

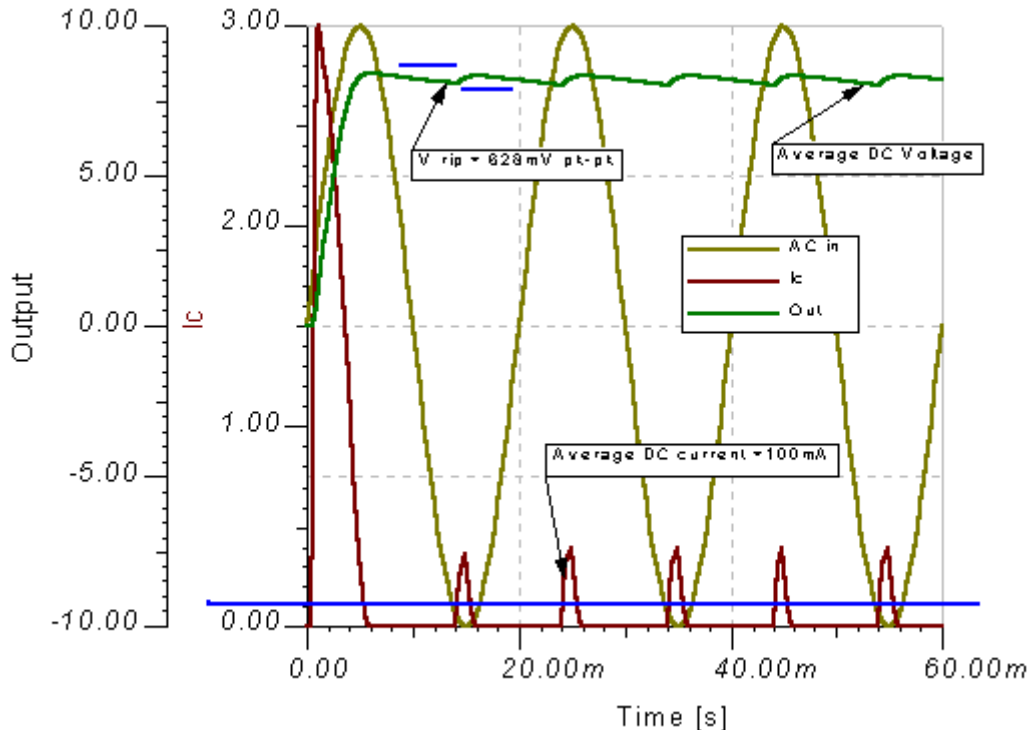


## Notes:

An approximate formula for determining the amount of ripple on an unregulated supply is:

$$V_{rip} = I_{load} * 0.007 / C$$

where  $I_{load}$  is the DC current measured through the load in amps and  $C$  is the value of the capacitor in uF. The diagram below shows an example with a load current of 0.1 amp and a smoothing capacitor value of 1000uF.



The calculated value of ripple is  $(0.1 * 0.007) / 1000e-6 = 0.7$  volts or 700mV. The value of peak-peak ripple measured from the graph is 628mV. Therefore, the equation is a good rule of thumb guide for choosing the correct value for a smoothing capacitor in a power supply.