

Operation: Learn Microwave Office
Assignment 1

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Watch video tutorials

AWR Design Environment (Microwave Office) tutorials are found at the following link:

http://www.aaronscher.com/Microwave_office_video_tutorials/Microwave_office_video_tutorials.html

This assignment is based on the following tutorials (found by clicking the link above)

Video 1: How to perform a DC analysis using NI AWR Microwave Office

Video 2: How to perform a transient analysis using NI AWR Microwave Office

Video 3: How to perform a steady state AC analysis using NI AWR Microwave Office

1. DC Analysis Problem (based on Video 1)

Figure 1 shows a simple DC circuit. Use Microwave Office to find the currents and voltages in this circuit.

What to turn in for this problem: For this problem, please turn in a screen capture of the schematic that has been annotated with “DC input currents for all elements” and “DC voltages for all nodes”, similar to what is done in Video 1.

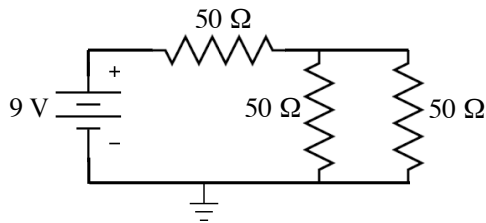


Figure 1. Simple DC circuit

2. Transient Analysis Problem (based on Video 2)

Figure 2 shows a simple first-order RC circuit. The source is a unit step function (0 V for $t < 0$ and 1 V for $t \geq 0$). Use Microwave Office to perform a transient analysis to find the voltage V_0 across the resistor.

What to turn in for this problem: For this problem, please turn in a screen capture of a plot of voltage V_0 versus time. Start your simulation at $t = 0$ and stop your simulation at $t = 5\tau$, where $\tau = RC$ is the time constant for this circuit.

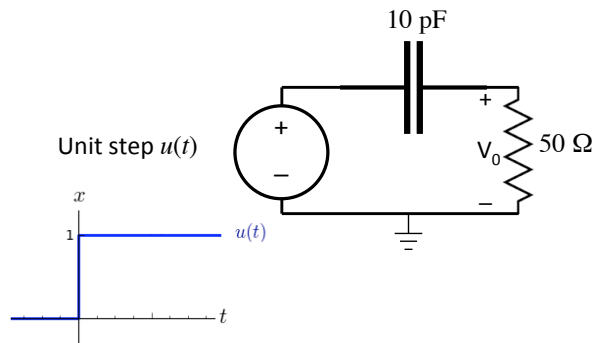


Figure 2. Simple first-order RC circuit

3. Steady-state AC analysis (based on Video 3)

Figure 3 shows a simple RC circuit. Use Microwave Office to perform a steady-state AC analysis to find the voltage V_0 across the resistor.

What to turn in for this problem: For this problem, perform a frequency sweep to find V_0 (magnitude and phase on different plots) and turn in screen captures of the two plots. The frequency sweep should be performed from $f = 1\text{MHz}$ to $f = 3f_c$, where $f_c = 1/(RC)$ is the cutoff frequency of this high-pass filter.

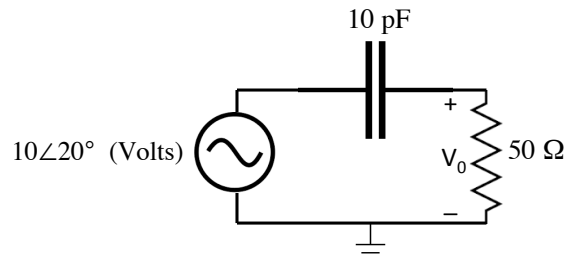


Figure 3. RC circuit at AC steady state.