UNIVERSITY OF CALIFORNIA, BERKELEY

EE100 Summer 2008 Lab 3

Capacitors and Inductors Lab Report

Name :		
Name :		
TA :		
Section :		

This write-up follows along with the Hands On section of the lab. You should complete this report as you do the lab exercises.

1) Are you able to measure the value of the resistor? If not, explain the reason why you cannot make the measurement. (Explain how the DMM works.)

2) Explain how you got your ohmmeter reading for the circuit in Figure 4. Why does it take some time before the ohmmeter's reading stabilizes?

3) Can you determine the RC circuit configuration (series or parallel) using an ohmmeter? If so, how?

4) Which box contains a series RC circuit? Which box contains a parallel RC circuit?

Series RC Circuit Black Box

5) What is the time constant τ_1 ? Also measure and record RX1.

6) What is the time constant τ_2 ? Also measure and record RX2.

7) Find the resistance and capacitance RB and CB. Ask your TA for the resistance and capacitance of the resistor and the capacitor inside the black box. Are they in good agreement with the values you have obtained experimentally? Explain if there is (are) any significant difference(s).

Parallel RC Circuit Black Box

8) What is the value of the resistor RB inside the black box?

9) What is the time constant of the circuit with R_x ? What is the value of the capacitor inside the black box? Ask your TA for the values of the resistor and the capacitor inside the black box. Are they in good agreement with the values you have obtained experimentally? Explain if there is (are) any significant differences.

4. Capacitors vs. Inductors

10)
Time shift: _____
Period: _____
Calculated phase shift: _____
Directly measured phase shift: _____

Explain the phase shift:



11) What happens as you increase the input frequency?

What happens as you decrease the input frequency?



6 MHz graph



100 KHz graph

12)
Time shift: _____
Period: _____
Calculated phase shift: _____
Directly measured phase shift: _____

Explain the phase shift:



5 KHz graph

13) What happens as you increase the input frequency?

What happens as you decrease the input frequency?



25 KHz graph

2 KHz graph

14)

Explain why the circuit in Question 11 behaved differently than the circuit in Question 12. Using the corresponding graphs with the capacitor and with the inductor as a basis, explain the differences between how capacitors and inductors react to time varying input voltages.