

Homework 1, ECEN 3400, Fall 2013, Covers Chapters 1-4
Zoya Popovic

Due: Monday, September 16, 2012, in class (3pm)

1. P1.9, page 17 in text
2. P2.1, page 26 in text
3. A surface-mount chip capacitor package has an unknown parasitic inductance L . You need to use the capacitor at some high frequency and therefore you need to find out what L is, i.e. is the capacitor starting to act as an inductor at your design frequency. To find the parasitic inductance, which is assumed to be the same for all capacitors with the same package, you can do the following experiment: order several capacitors of different values – 10pF, 40pF, 80pF. Then connect each to ground and measure the input impedance as a function of frequency. The measurement shows resonant frequencies of 1.01, 1.99 and 8.001GHz (how do you know what the resonant frequency is from an impedance measurement?). What is your best estimate of the parasitic inductance of this surface-mount package? What is your estimate on the tolerance in the value of the spec-sheet capacitance?
4. P3.14, page 39 in text
5. P3.23, page 40 in text
6. P4.5, pages 53 in text
7. P4.12, page 53,54 in text
8. *Extra credit - on separate piece of paper please, or emailed to me at zoya@colorado.edu*

P1.10, page 18 in text (maximum 1 page, font size 12, 2.54cm margins, single-spacing, include references. Any web-site references need to be peer-reviewed).