Homework #3 ECE145A/218A Winter 2007
Due Friday, 2/2 @ 5pm

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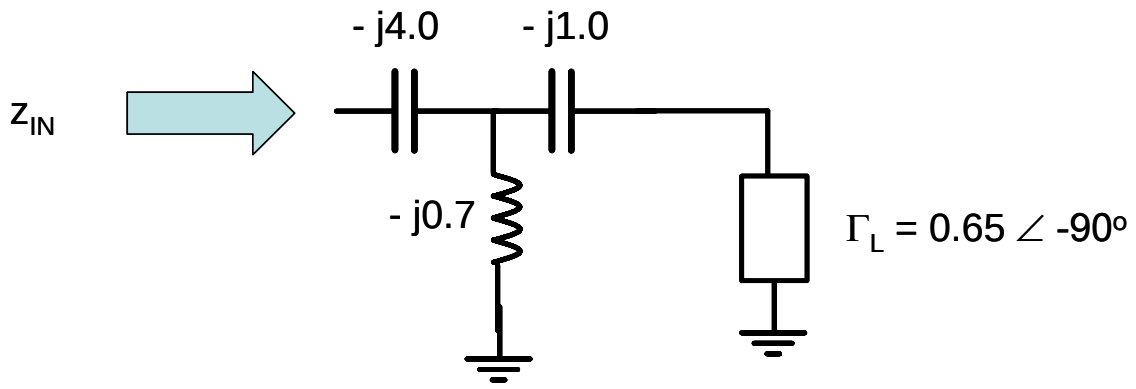
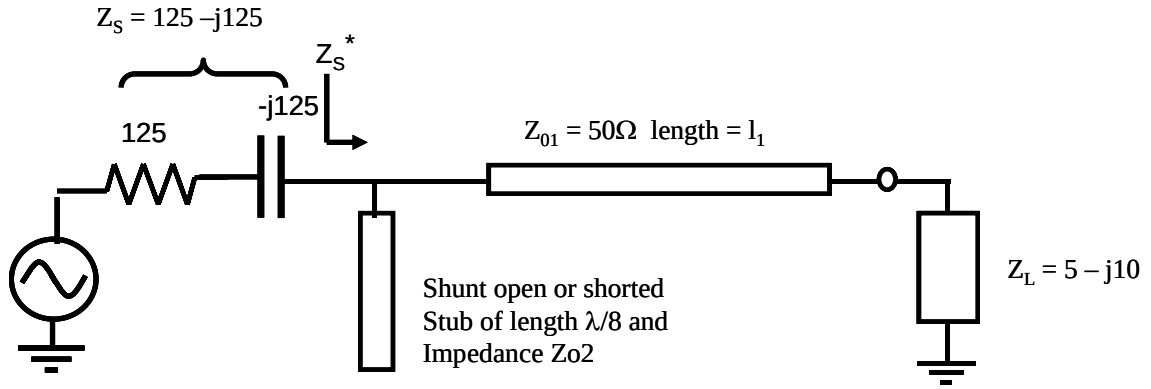
1. (Refer to Bowick, Impedance Matching, on the eres website)
a. Determine z_{IN} and the Q of the 3 element T matching network below. Zo = 50Ω.
b. Design a PI network matching circuit that provides the same normalized input impedance z_{IN} and same Q. You can leave the element values for the new network as normalized susceptances and reactances.
c. Verify your result on the Smith chart and on ADS (assuming a frequency of 1 GHz)



2. a. Design the distributed matching network shown below to match Z_S to Z_L for maximum power transfer. You need to determine the length l_1 of series 50 ohm line (in wavelength or degrees) and choose the characteristic impedance Z_{02} of the λ/8 shunt stub. You must also decide whether to use an open or shorted shunt stub. Use the ADS simulator to verify the design.



b. What is the maximum Q for this design?