



Homework #2

Date: October 8, 2012

Due: October 15, 2012; No late work accepted;

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- Use A4 paper to write/print your answer.
- Your name and student ID on the cover page.
- Staple the pages!!!

1. Calculate the input impedance of the circuit shown below.

- a) X is an inductor;
- b) X is a capacitor;
- c) X is an inductor in series with a capacitor;
- d) X is an inductor in parallel with a capacitor.

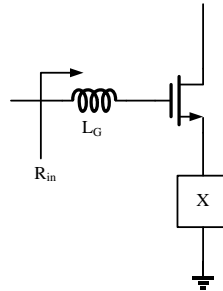


Fig.1



2. An LNA circuit is shown below. Ignore the gate-induced noise and assume that the drain current thermal noise is given by $i_d^2 = 4kT\gamma g_m \Delta f$.

- Write the expressions for the center frequency and the condition for input matching?
- For an input matched condition derive an expression for the noise figure.
- What is the minimum value of noise figure for this amplifier?

Hints: Check the example on slides 20-30 of lecture 3.

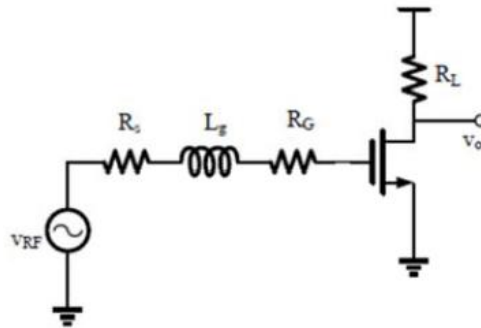


Fig.2