25 Spring ECEN 607: Advanced Analog Circuit Tech

Design Pre-lab Report

Lab3: Op Amp Design - I

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1. Design the circuit shown in Fig 1 to obtain the specifications given (Table 1). Identify the dominant noise sources and find the expression for the input referred thermal noise density. Show the hand-calculations for the input referred thermal noise density and report the estimated value. Obtain the profile of the flicker noise from simulations and identify the corner frequency between thermal and flicker noise density.

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1/gm8= 2.156k

b) Estimate the compensating resistor to cancel the RHP zero and be sure you guarantee phase margin of 450 or better. One can become greedy and decide to move the zero and cancel the first non-dominant pole. Compare the magnitude and phase response of the circuit and report phase and gain margin values. Include screen shots in your report.

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| R=1/gm8 cancel zero |

c) Over design the RHZ by moving the zero to the left-hand side of the S-plane around the value of 2\*gm8/Cc. Repeat the simulations in b) and compare the results. Conclusions?

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| R=2/gm8 LHP zero |

Rz

4k Ω Moves zero to LHP, improves phase margin slightly

2k Ω Cancel the zero