

Tutorial #11

Problem 1 – Common Source Amplifier Frequency Response

1. (E10.8) You are given an PMOS common-source voltage amplifier with a current source supply with $I_{SUP}=50\mu A$ and $r_{oc}=\infty$. The PMOS device has a $W/L=50\mu m/2\mu m$. The source resistance, $R_S=10k\Omega$ and the load resistance R_L is infinity. Assume that all the devices are operating in their constant-current region.
 - a) Calculate the open-circuit voltage gain at low frequency.
 - b) Calculate ω_{3dB} using the Miller Approximation and considering only C_{gs} and C_{gd} of the PMOS device.
 - c) Repeat (b) using the OCTC method.

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