HSPICE Homework #4 of「類比積體電路導論」

作業繳交截止日期: **Nov.21 , 2024** (上傳E3 數位平台繳交)

As the amplifier circuits shown in the following Figs. (a), (b), and (c), please perform HSPICE simulations with the device parameters of U18 0.18μm CMOS technology. Simulate at TT corner with temperature 25°.

From your simulation results,

(1) Find the low-frequency voltage gain Av=Vout/Vin and the 3-dB bandwidth by using AC analysis for the amplifiers in Figs. (a), (b), and (c), respectively.

	Fig. (a)	Fig. (b)	Fig. (c)
Av (dB)			
3-dB bandwidth (Hz)			

(2) Compare both low-frequency voltage gain Av and 3-dB bandwidth between these two amplifiers in Figs. (a) and (b). Please explain the reasons why they are larger or smaller.

(3) Compare both output noise voltage and input-referred noise between these two amplifiers in Figs. (a) and (c). Please describe the results you observed and explain whether you think MN2 in Fig. (c) has a significant impact on the total output noise. If not, please explain the reason for your assessment.

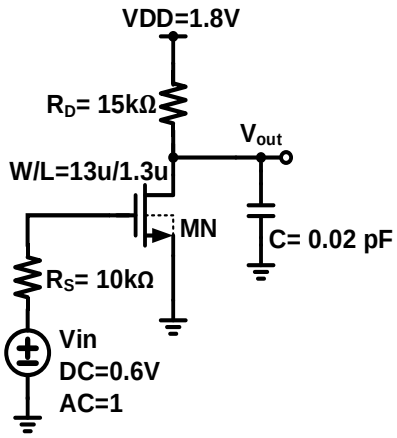

Fig. (a)

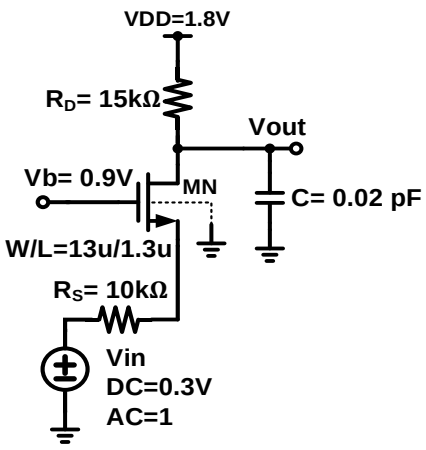

Fig. (b)

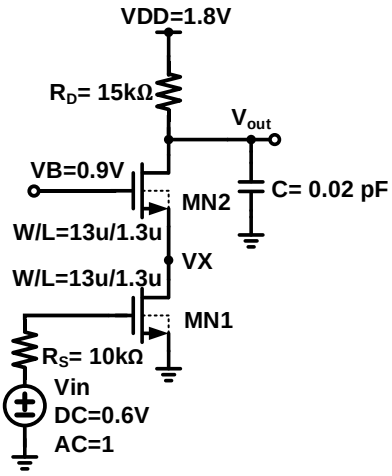

Fig. (c)

HSPICE_HW4：作業需要有以下幾點：

1. HSPICE Code (截圖)
2. Simulation Result (波形繳交背景請用白色，並且波形標示和呈現要清楚)
   第 1 題：請展示 Vdb(Vout)的波形並 mark 3db 點
   第 3 題：請展示 1~150MHz outnoise & innoise 的波形並將 X 軸(Hz)用 Log Scale 呈現。
3. 每個小題的單獨說明
   問題(1) 列成表格
   問題(2) 比較並說明
   問題(3) 比較並說明
   以.pdf 的格式上傳
4. 檔案名稱用「Hspice_HW4_自己的學號」(例如：Hspice_HW4_0811541)，於作業繳交截止日期前，上傳到指定的 E3 數位平台繳交