

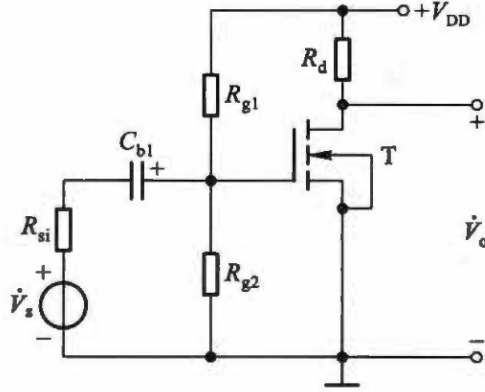
# Homework for Chapter 6

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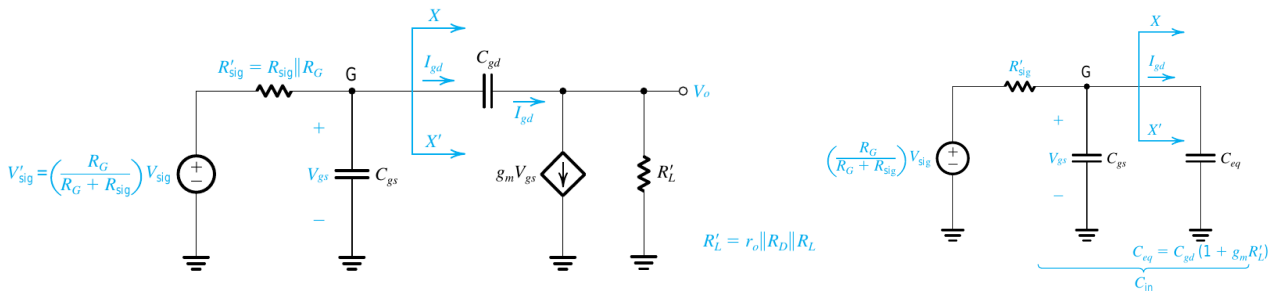
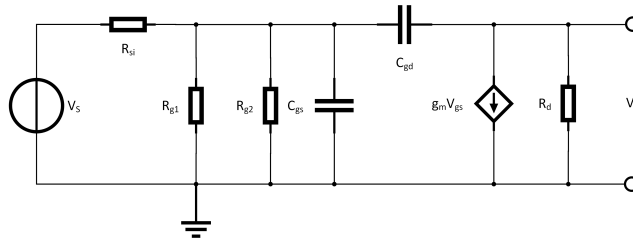
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6.4.4 电路如图题 6.4.4 所示, 其中  $+V_{DD}=5V$ ,  $R_{si}=1\text{ k}\Omega$ ,  $R_{g1}=15\text{ k}\Omega$ ,  $R_{g2}=10\text{ k}\Omega$ ,  $R_d=4\text{ k}\Omega$ ,  $g_m=0.8\text{ mS}$ ,  $\lambda=0$ ,  $C_{gs}=1\text{ pF}$ ,  $C_{gd}=0.5\text{ pF}$ 。试估算源电压增益的上限频率  $f_H$  和中频源电压增益  $\dot{A}_{vSM}$ 。



图题 6.4.4



$$R_G = R_{g1} \parallel R_{g2} = 6 \text{ k}\Omega$$

$$R'_{sig} = R_{si} \parallel R_G = 0.857 \text{ k}\Omega$$

$$R'_L = R_d = 4 \text{ k}\Omega$$

$$C_{eq} = (1 + g_m R'_L) C_{gd} = 2.1 \text{ pF}$$

$$C_{in} = C_{eq} + C_{gs} = 3.1 \text{ pF}$$

$$f_H = \frac{1}{2\pi R'_{sig} C_{in}} = 60 \text{ MHz}$$

$$\dot{A}_{vSM} = -g_m R_d \cdot \frac{R_G}{R_{si} + R_G} = -2.74$$