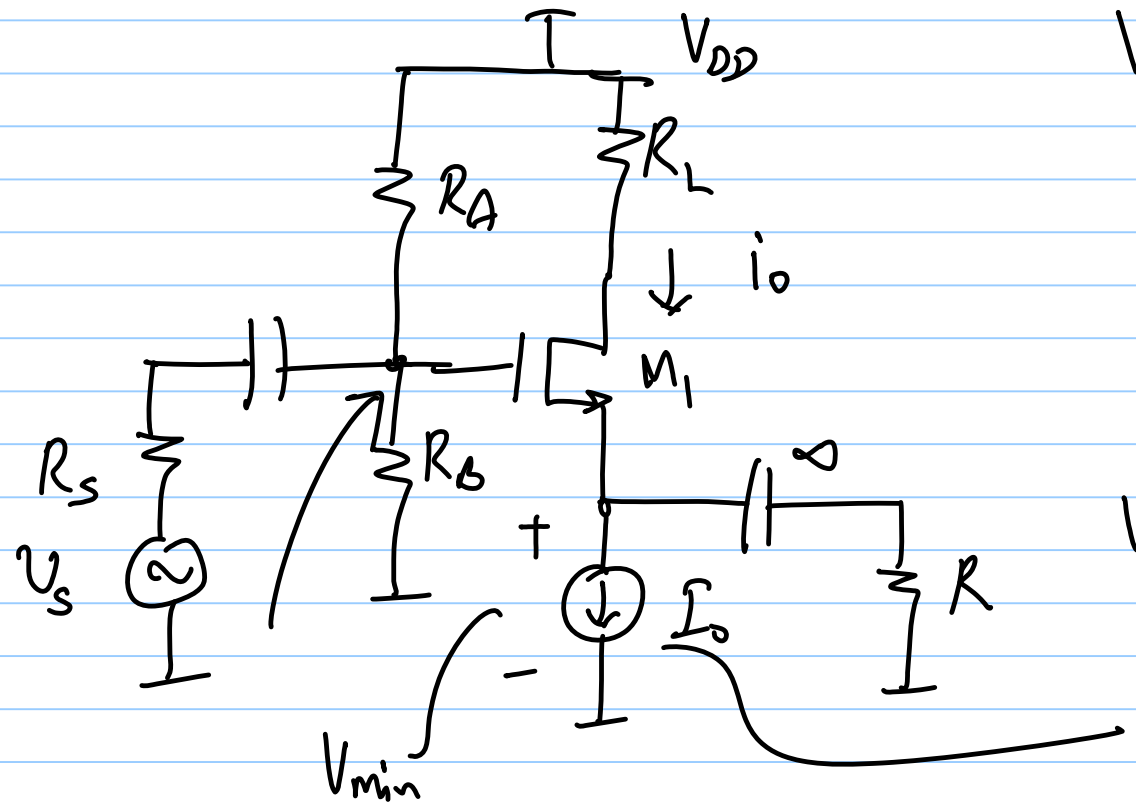
29/8/19

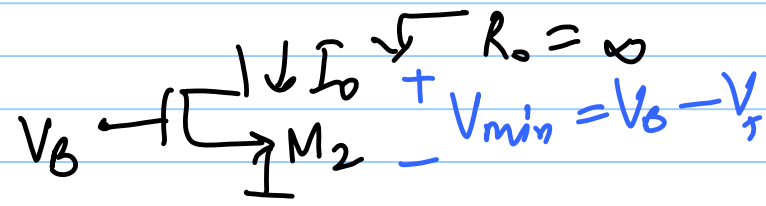
Lec 15

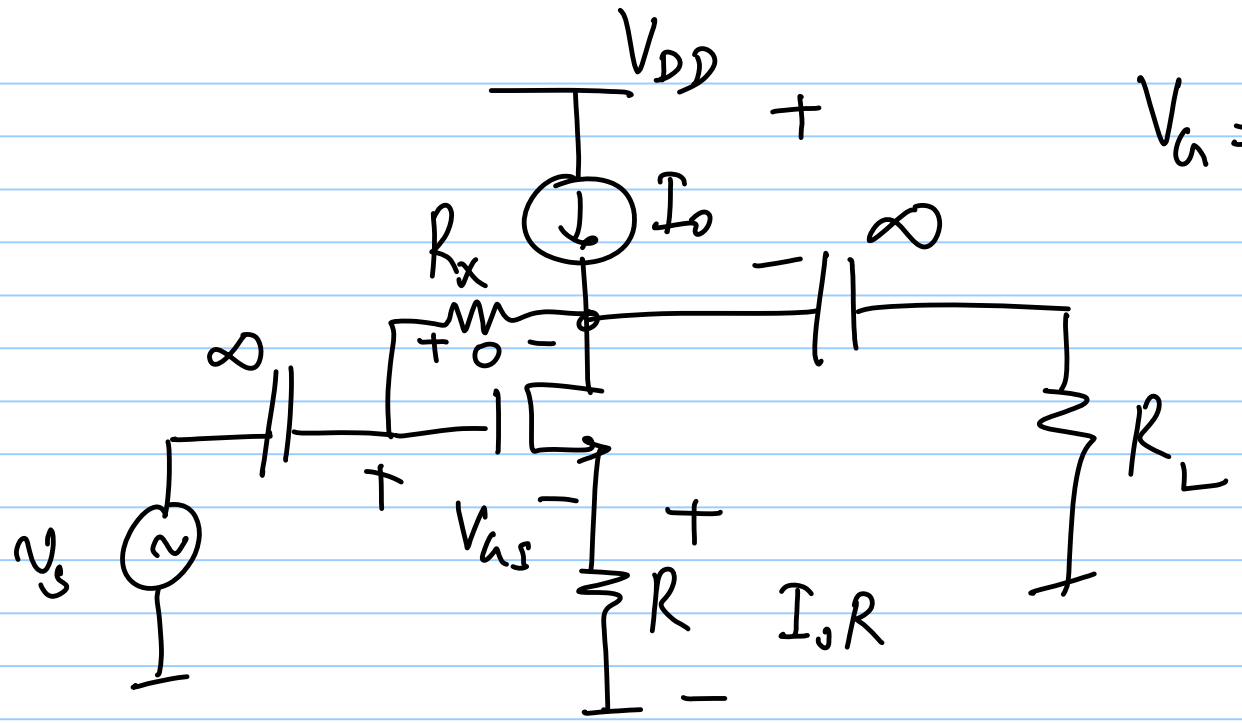


$$V_{G_1} = \frac{R_B}{R_A + R_B} \cdot V_{DD}$$

$$\geq V_{min} + V_{GS}\big|_{I_o}$$

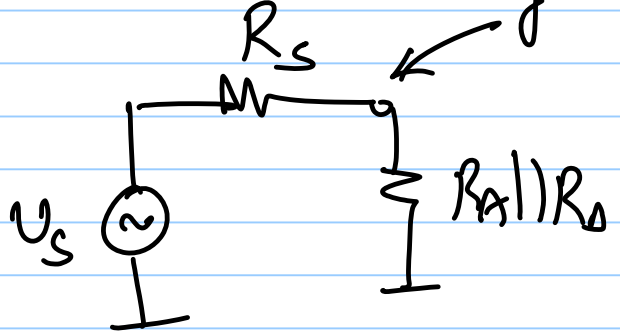
$$V_{D_1} = V_{DD} - I_o R_L$$

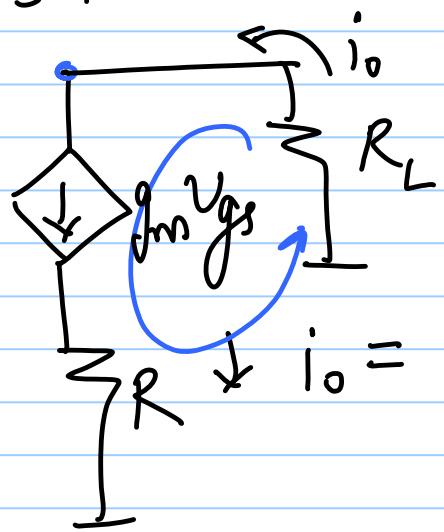




$$V_G = V_D = I_o R + V_{GS} \Big|_{I_o}$$

$$v_g = \frac{R_A \| R_B}{R_S + R_A \| R_B} \cdot v_s \approx v_s$$

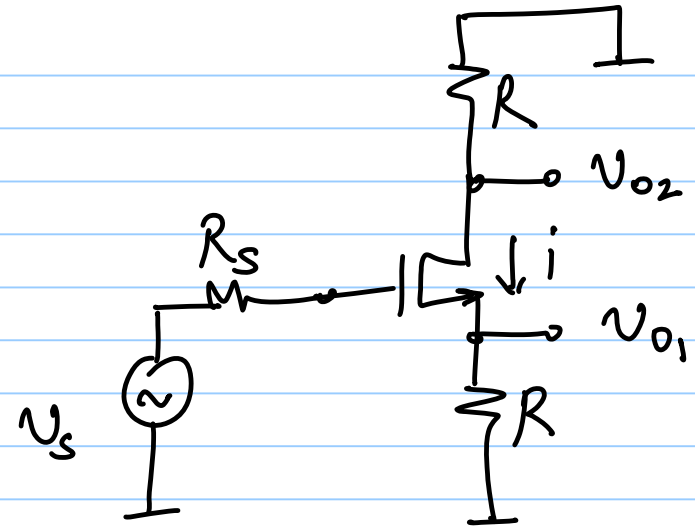




$$i_o = \frac{g_m}{1 + g_m R} \cdot v_s$$

$$= \frac{v_s}{R} \cdot \frac{g_m R}{1 + g_m R}$$

Condition: $g_m \gg \frac{1}{R}$



$$v_{o2} = -\frac{g_m R}{1+g_m R} \cdot v_s \simeq -v_s$$

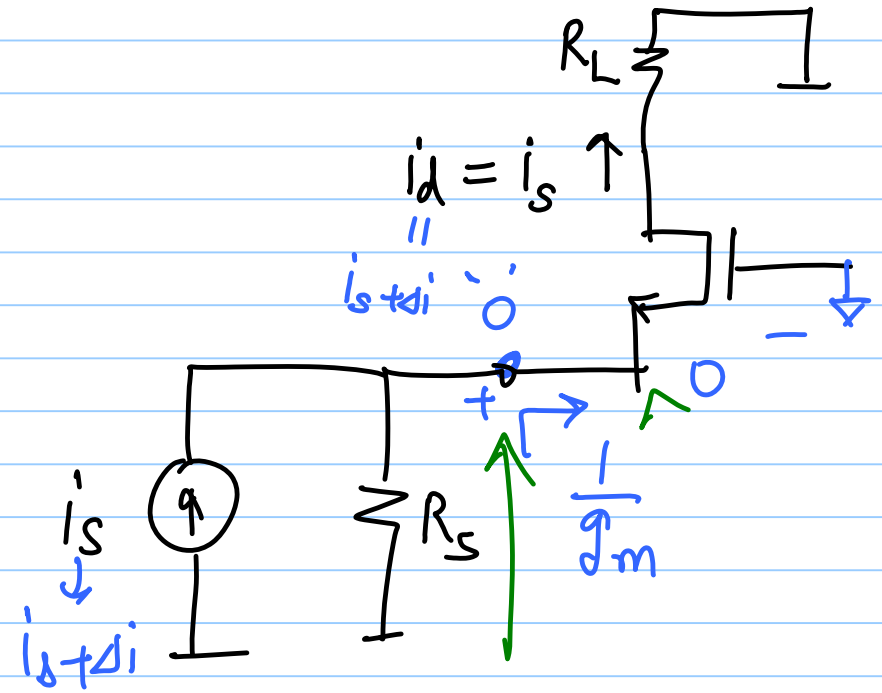
$$v_{o1} = \frac{g_m R}{1+g_m R} \cdot v_s \simeq v_s$$

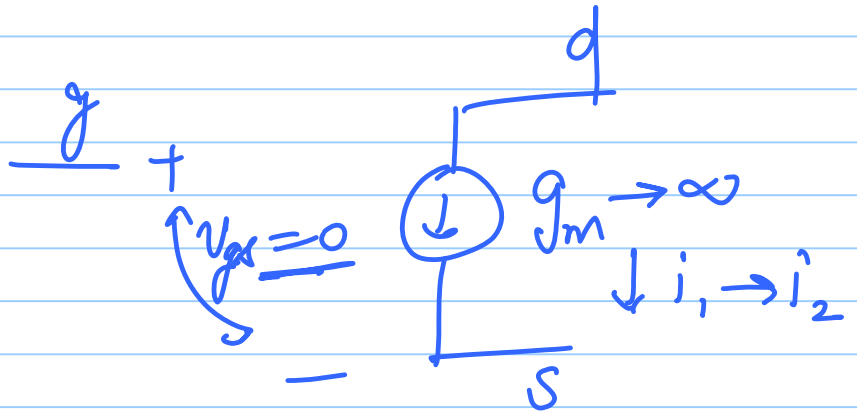
"Phase Splitter" Circuit

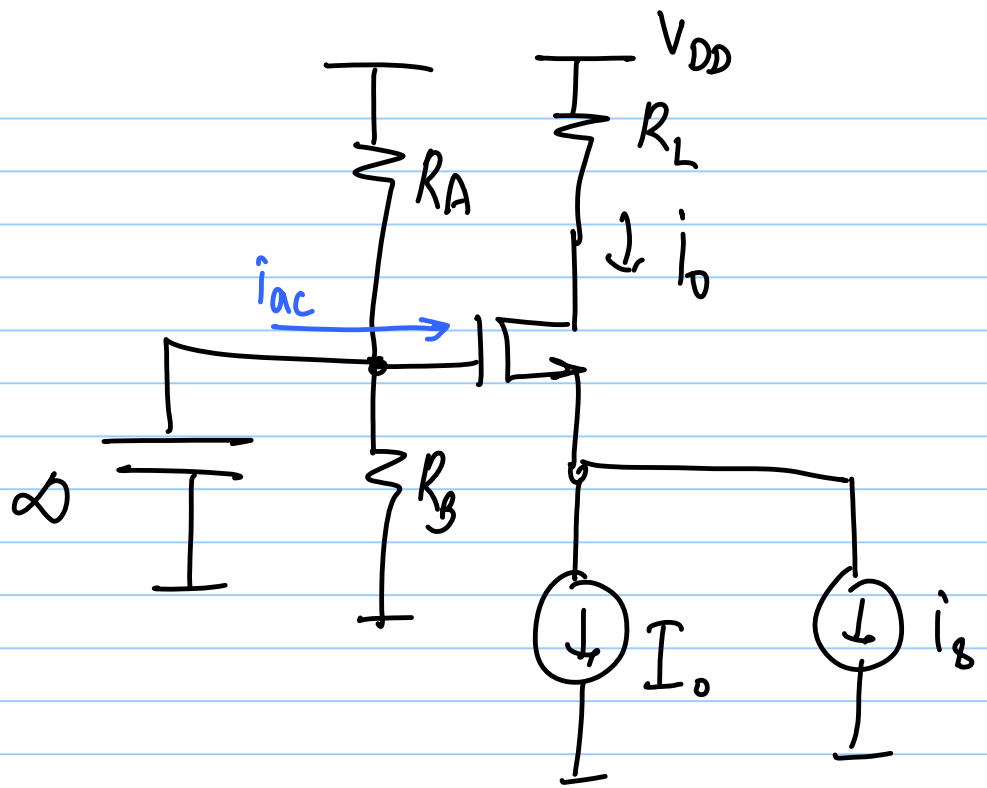
$$i = \frac{g_m}{1+g_m R} \cdot v_s$$

incremental CCCS , gain = 1, $R_{in} = 0$

$R_{out} = \infty$







" Common - Gate Amplifier"