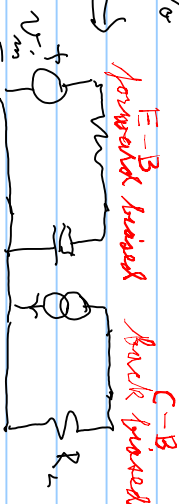
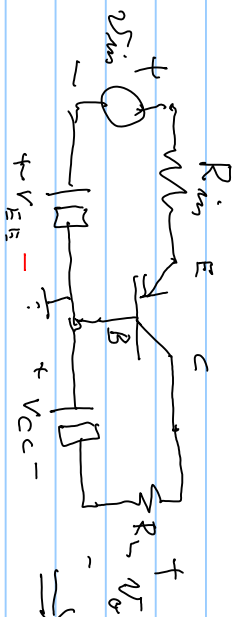


EE303
09/07/17

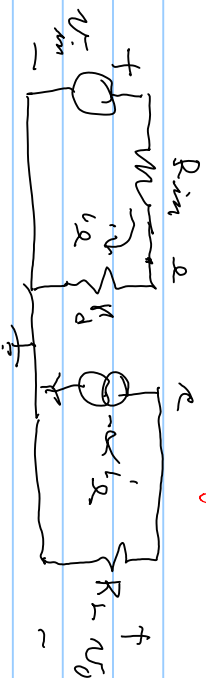
Note Title

9/7/2017

TRANS for AEI STOR



Small signal



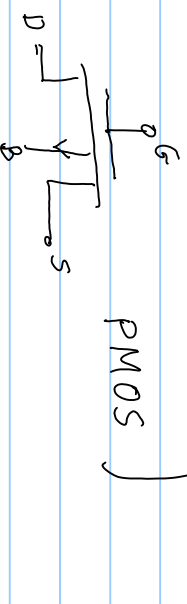
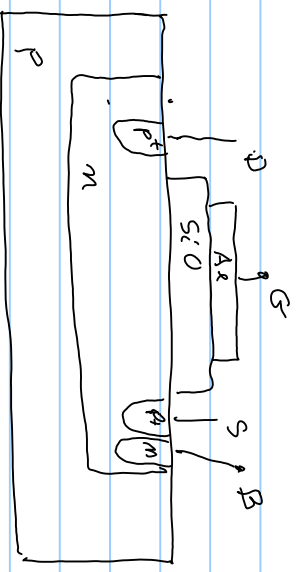
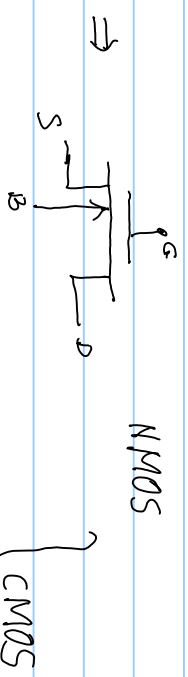
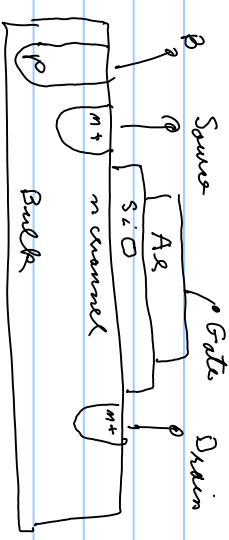
$$g_d = 1/r_d = I_E/V_T$$

$$v_o = -(\alpha i_e) R_L, \quad i_e = v_{in} / (R_{in} + R_d)$$

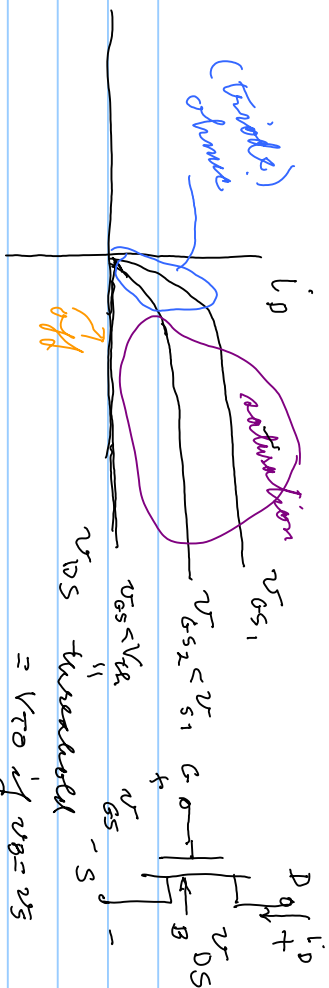
$$\Rightarrow \frac{v_o}{v_{in}} = \frac{\alpha R_L}{R_{in} + R_d}$$

range
large sig
choice of load R_L

MOS = metal oxide silicon (metal oxide transistor)



voltage control by gate voltage



NMOS

applies parameters $V_{TO} = \text{turn on}$

$$i_D = \frac{\mu_p}{2} \frac{W}{L} \begin{cases} 0 & \text{when } V_{GS} < V_{th} \\ (V_{GS} - V_{th})^2 & \text{when } 0 < V_{th} < V_{GS} \leq V_{DS}^{\text{sat}} \\ 2(V_{GS} - V_{th})V_{DS} - \frac{1}{2}V_{DS}^2 & \text{when } 0 < V_{th} < V_{DS} \leq V_{GS}^{\text{sat}} \end{cases}$$

all get multiplied by $(1 + \lambda V_{DS})$ $\lambda = \text{LAMBDA}$

multiply by λ slope λ to all curves