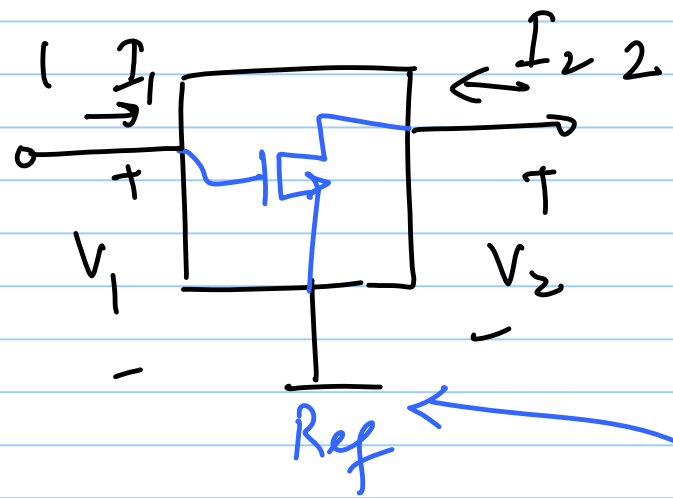
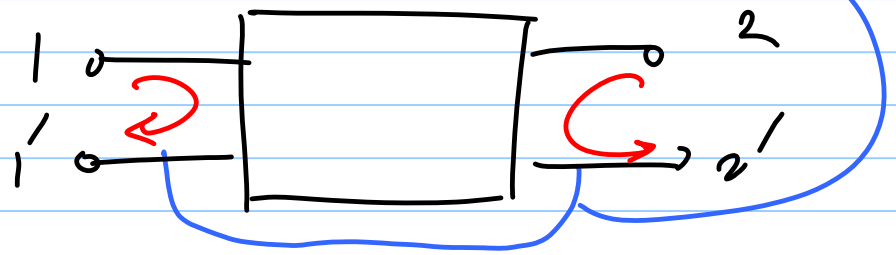
4/9/19

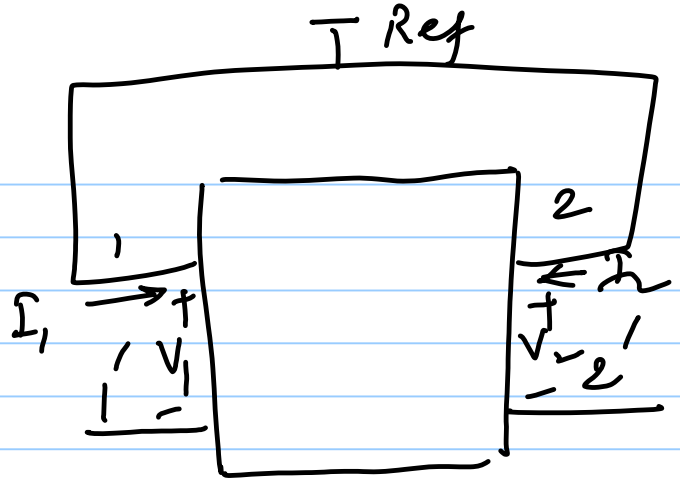
Lec 17

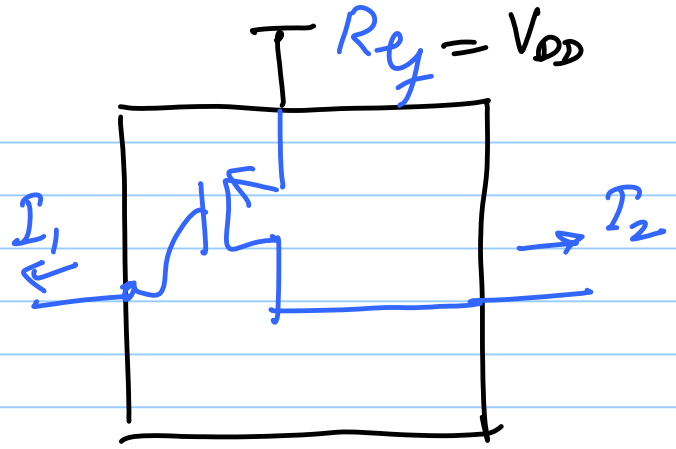




I_1 = constant

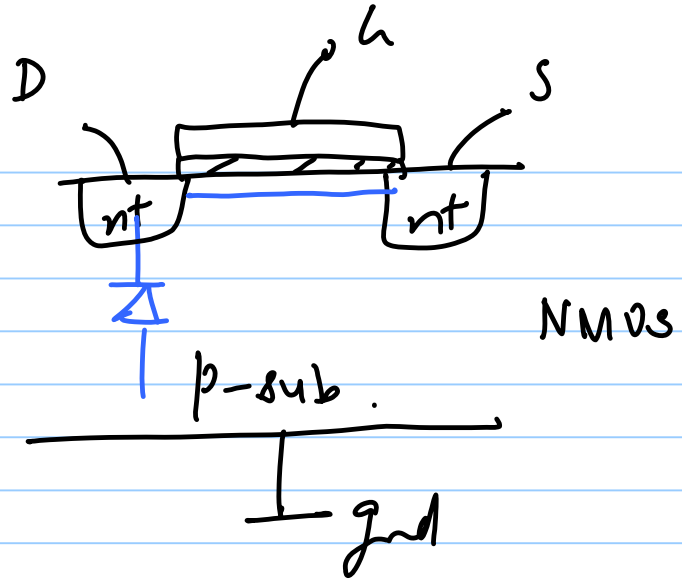
$I_2 = f(V_1)$ only





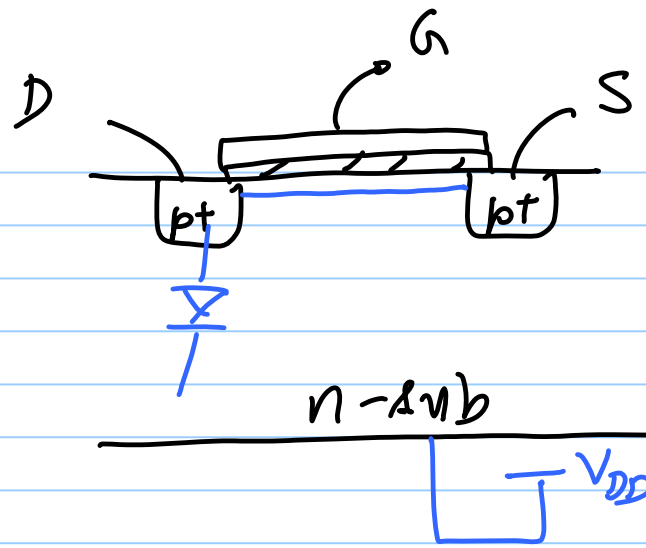
"PMOS" transistor,

p- channel MOSFET, pMOSFET



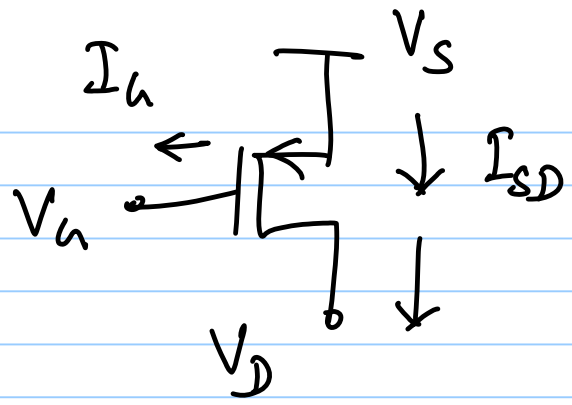
NMOS

$V_G = V_{DD} - V_{Tp}$



PMOS

Cut off: $V_{SG} \lesssim V_{Tp}$: $I_{SD} = 0$



$I_G = 0$

$I_S = I_D$

V_{Tp} is positive

Sat: $V_{SD} \geq V_{SG} - V_{Tp}$

or

$V_D \leq V_G + V_{Tp}$

$V_{SG} \leq V_{Tp}$: $I_{SD} = 0$ $\Rightarrow$ Cutoff

$V_{SG} \geq V_{Tp}$: $I_{SD} = \frac{1}{2} \mu_p C_{ox} \left(\frac{W}{L}\right) (V_{SG} - V_{Tp})^2 (1 + \lambda_p V_{SD})$ (saturation)

" : $I_{SD} = \mu_p C_{ox} \left(\frac{W}{L}\right) \left[(V_{SG} - V_{Tp}) \cdot V_{SD} - V_{SD}^2/2 \right]$ (triode)