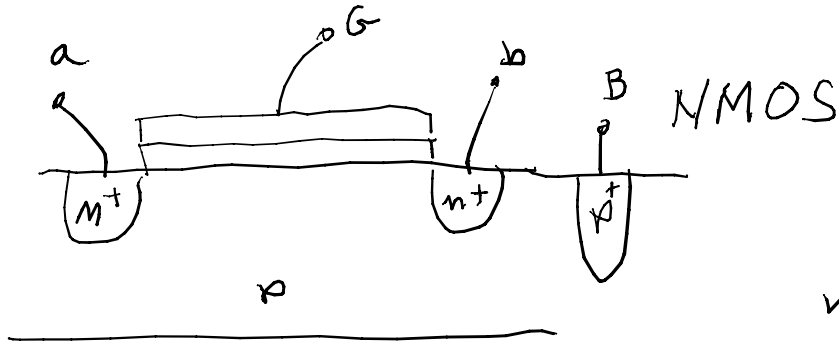


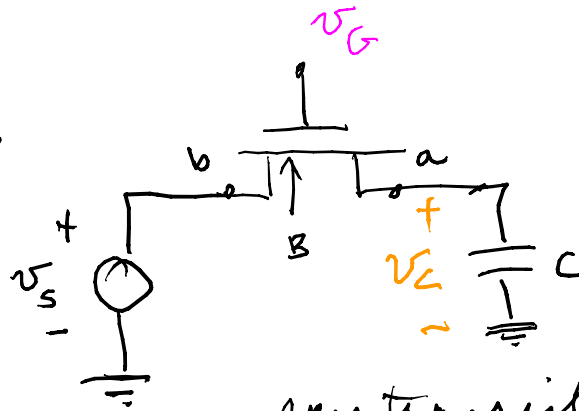
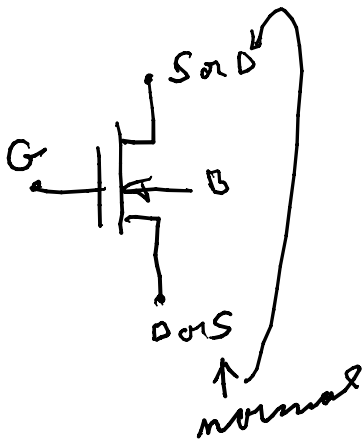
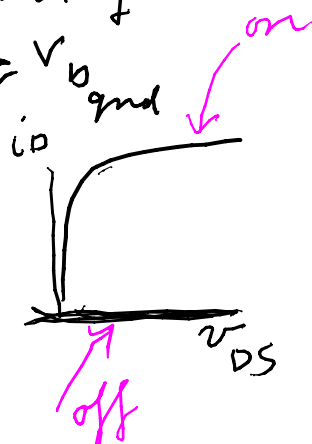
EE303
03/01/06



$a = \text{source if } V_{a, \text{gnd}} \leq V_{b, \text{gnd}}$

$a = \text{drain if } V_{a, \text{gnd}} > V_{b, \text{gnd}}$

$V_{a, \text{gnd}} > V_{b, \text{gnd}}$



Pass transistor
= switch

case $v_G >$ any other voltage
 \Rightarrow switch closed

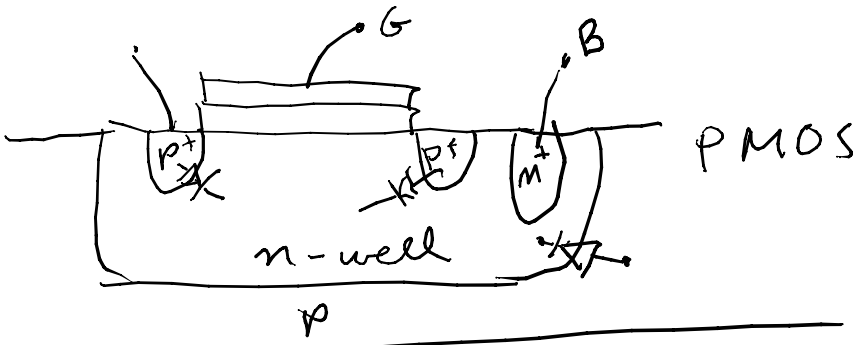
if $v_c > v_s$ current flows from cap to $v_{\text{source}} = i_D$
 $\Rightarrow v_{a,b} > 0 \Rightarrow a = \text{drain}$

if $v_c < v_s$ current flows from source to cap = i_D
 $\Rightarrow v_{b,a} > 0 \Rightarrow a = \text{source}$

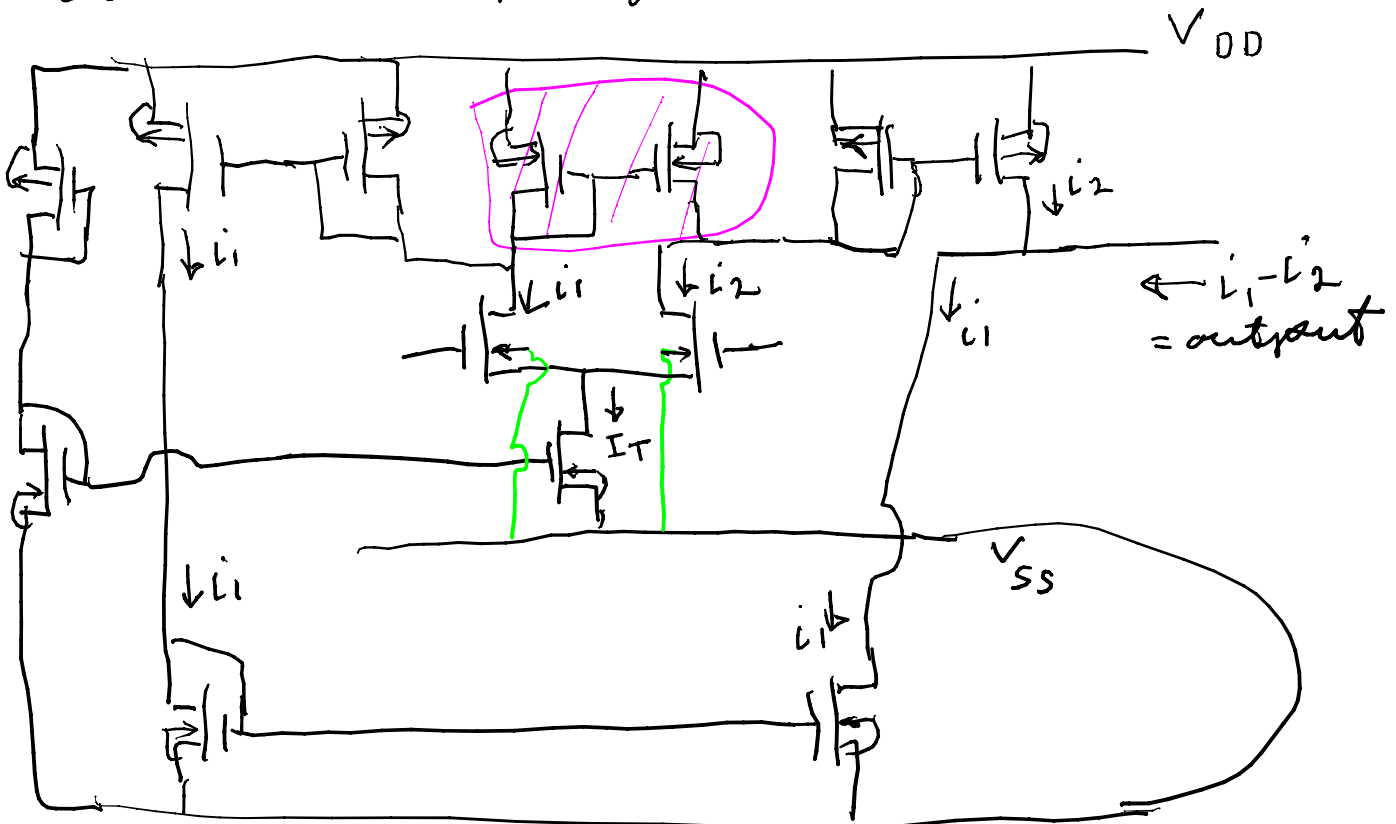
\therefore as often a can be the source or the drain we do

not normally want to tie B to a or b
 thus tie B on an NMOS to the lowest potential
 in the circuit,

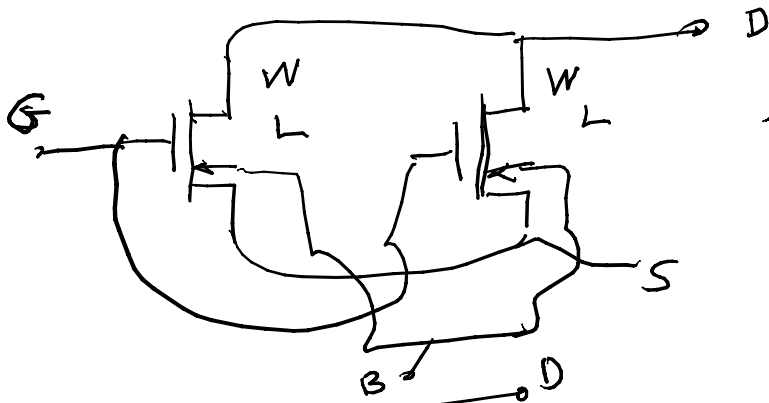
tie on a PMOS to the highest potential



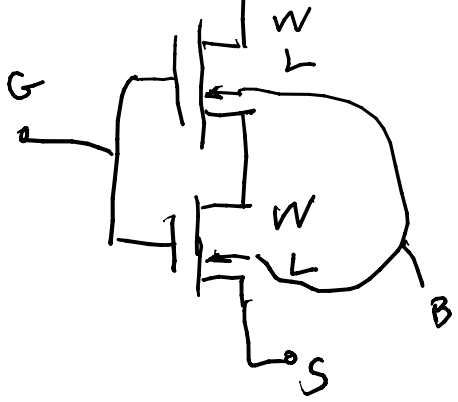
Current Mirror for diff. pairs



for 4007 to change W or L (by factors of 2)

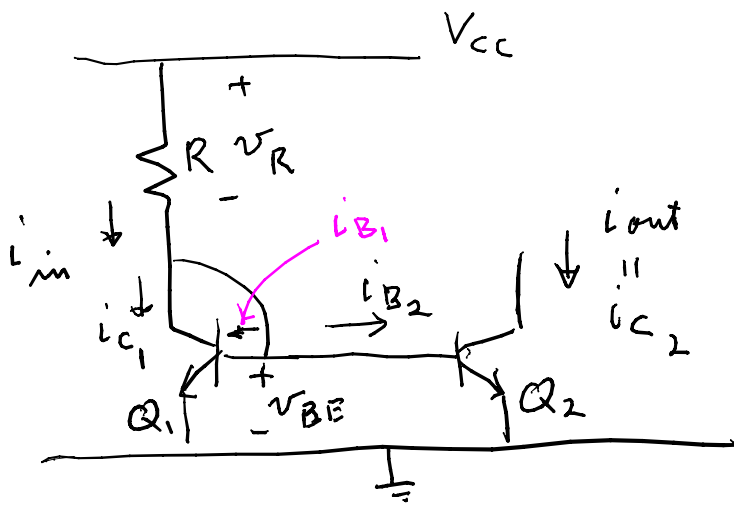


here $\approx W_{II} = 2W$
 $L_{II} = L$



here $\approx W_S = W$
 $L_S = 2L$

For BJT current mirrors



$V_{BE} \approx 0.7$

$V_R = V_{CC} - 0.7$

$I_{in} = \frac{V_{CC} - 0.7}{R}$

$\Rightarrow R = \frac{V_{CC} - 0.7}{I_{in}}$

$I_{out} \approx I_{in}$