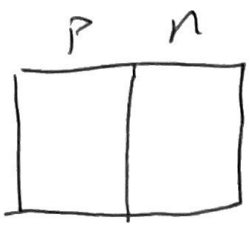
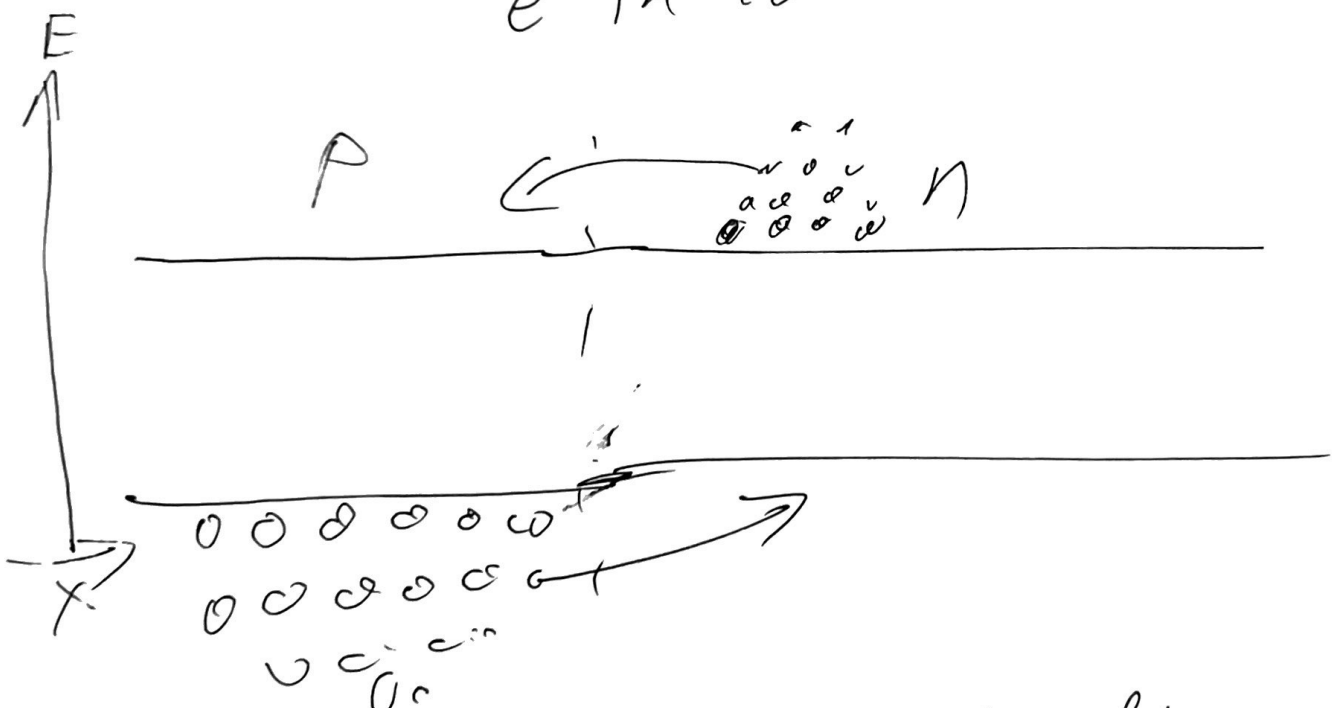
p n

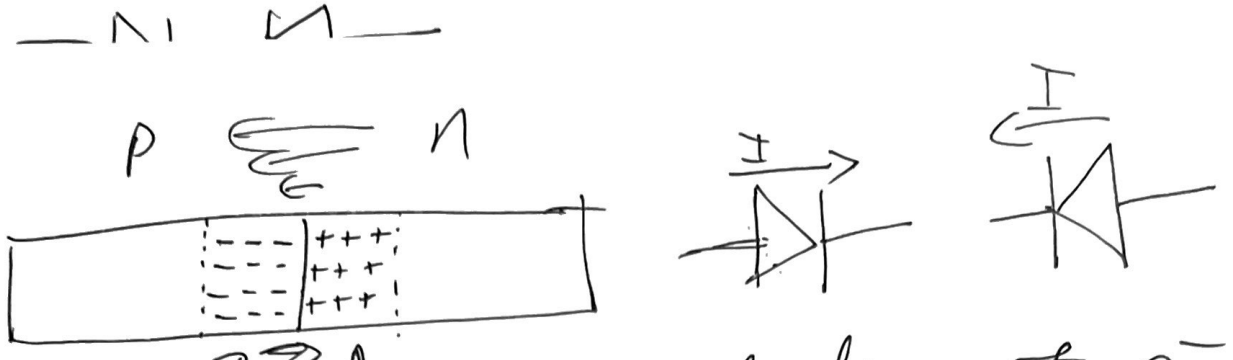


P-type semiconductor: a semicond. doped such that we have a concentration of holes in the valence band

n-type semi: doped s.t. we have a concentration of e^- in conduction band

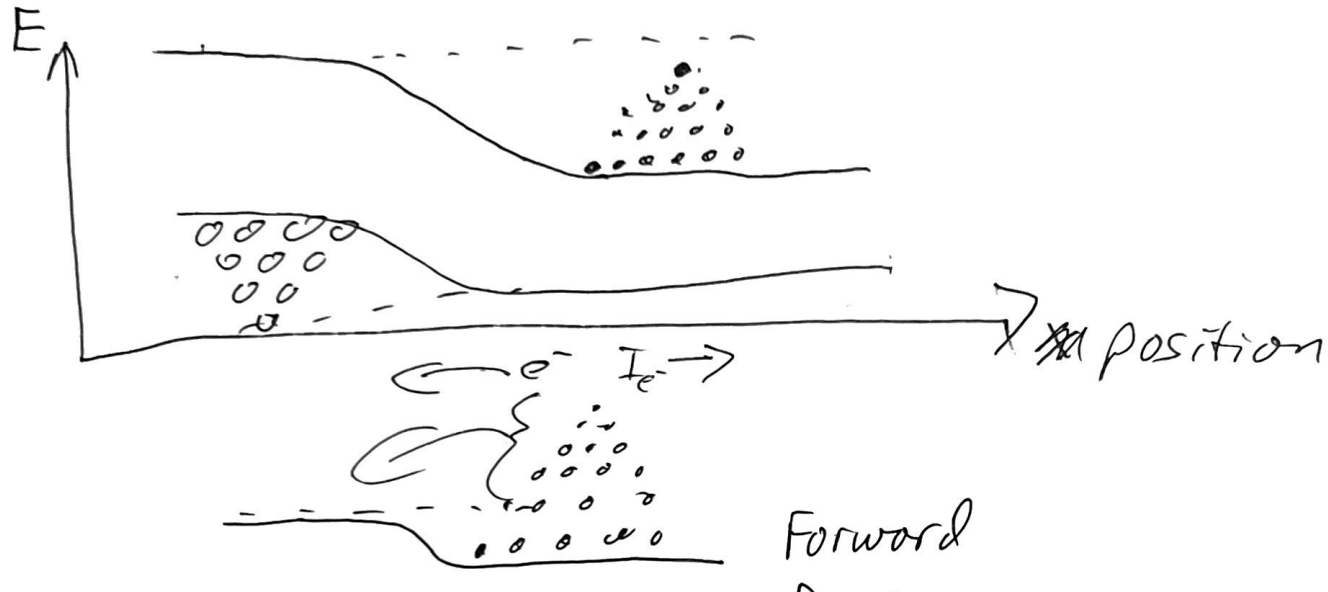


- When we put the pn junction together we get a depletion region at the interface

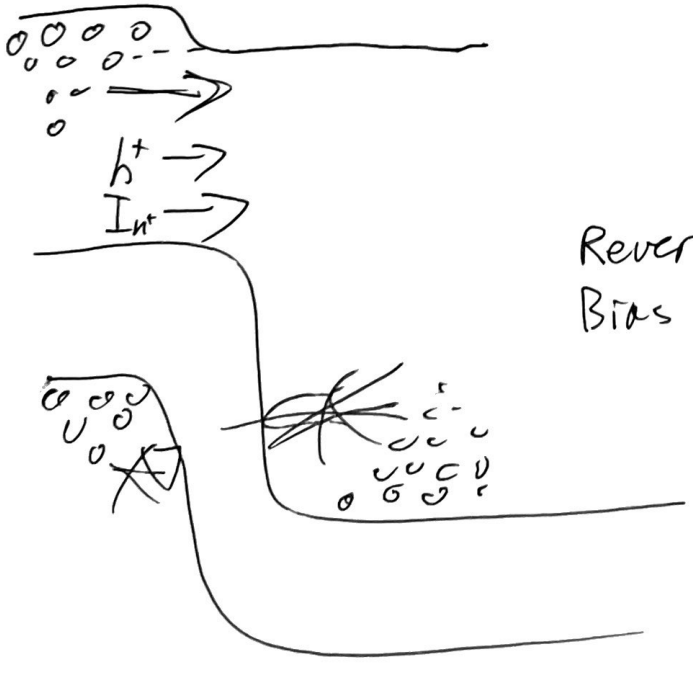


no concent. of holes

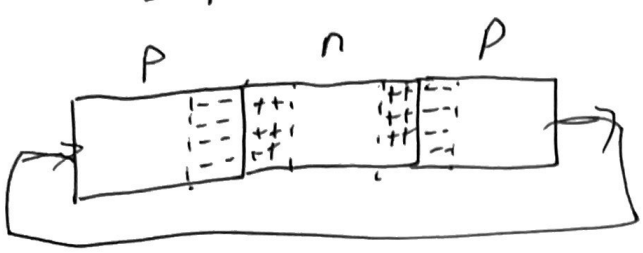
no concentration of e^-

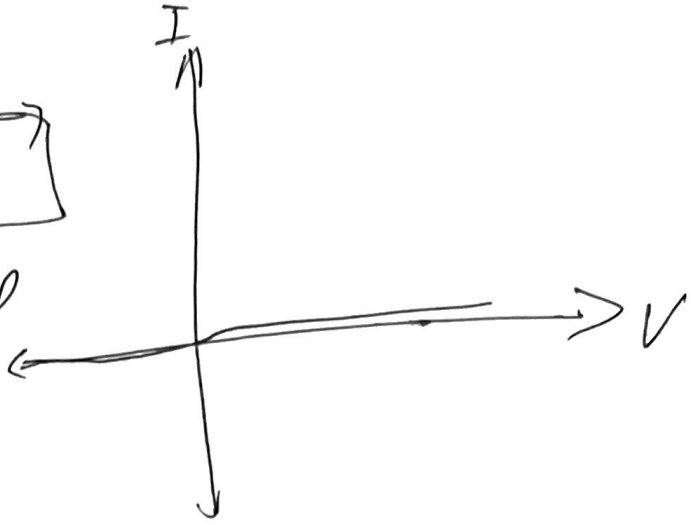


Forward Bias

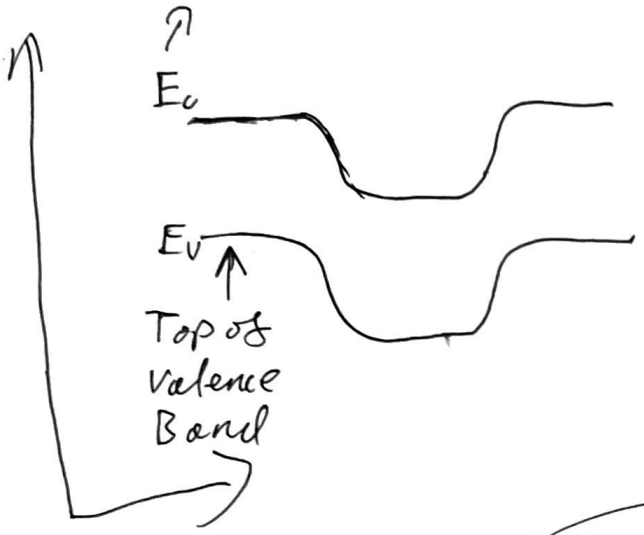


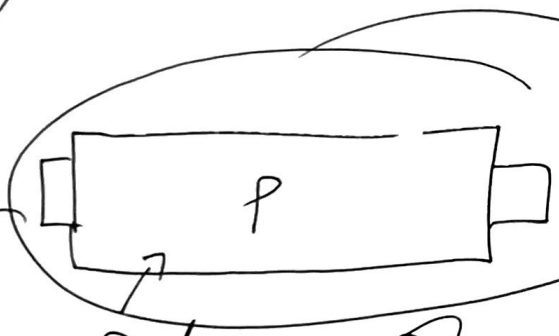
Reverse Bias





Bottom of Conduction Band

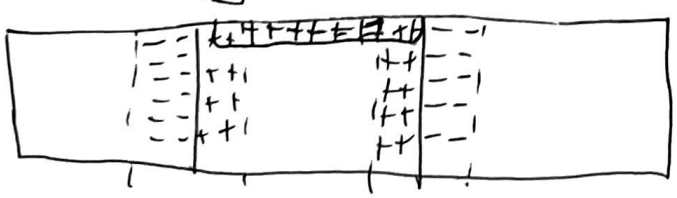


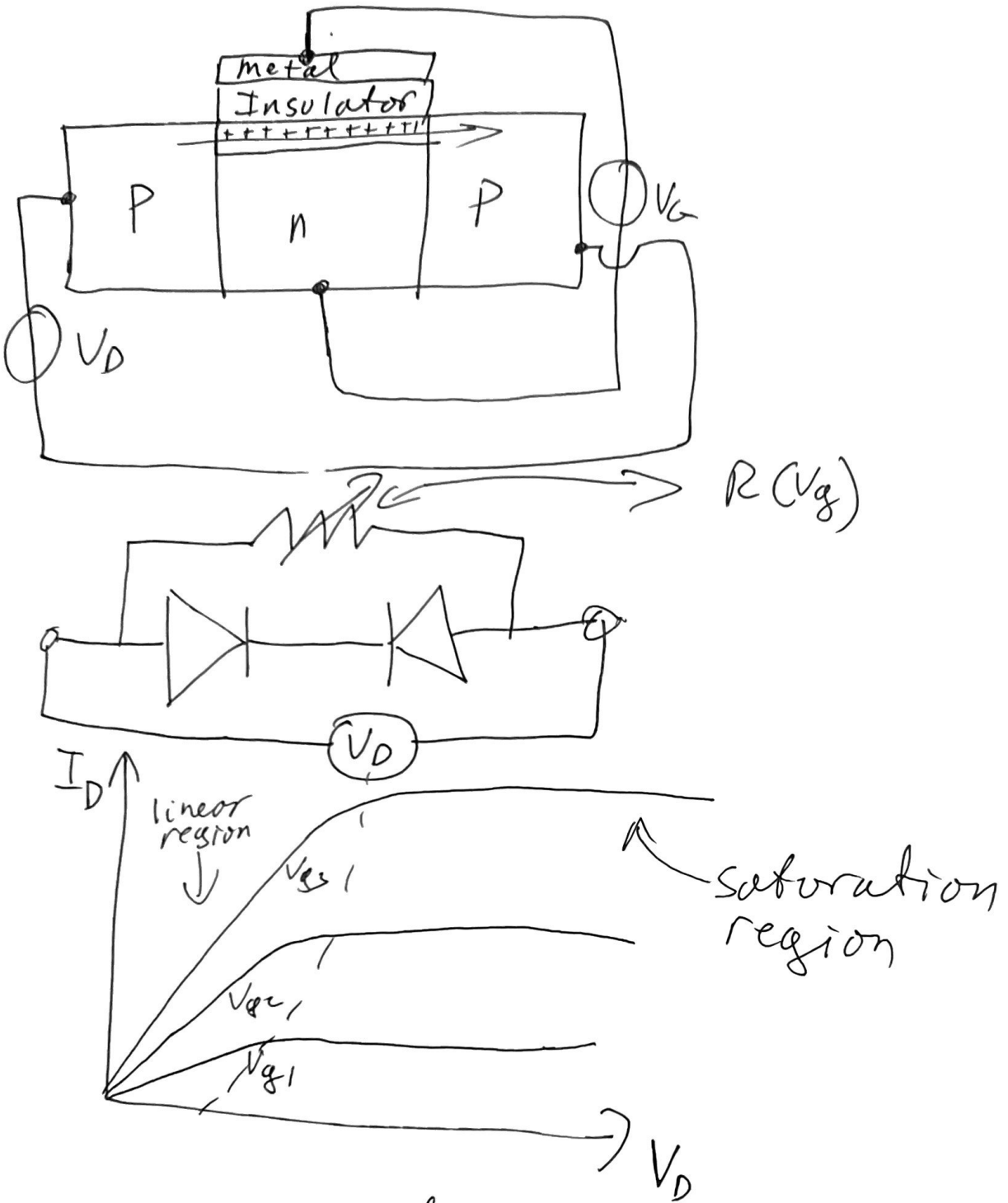


$$R = \rho \frac{l}{A} \qquad \rho \propto \frac{1}{\text{conc elec}} \qquad \rho \propto \frac{1}{n + p}$$

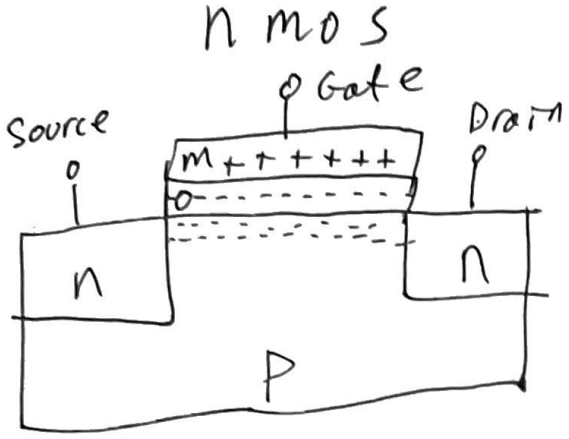
conc holes

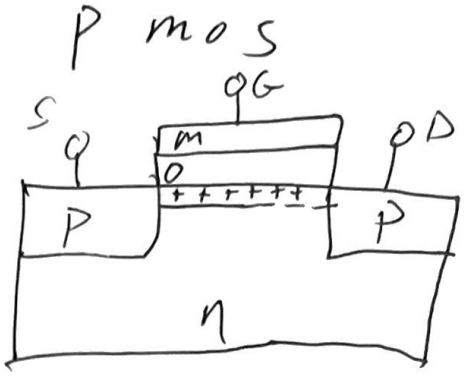
conc elec

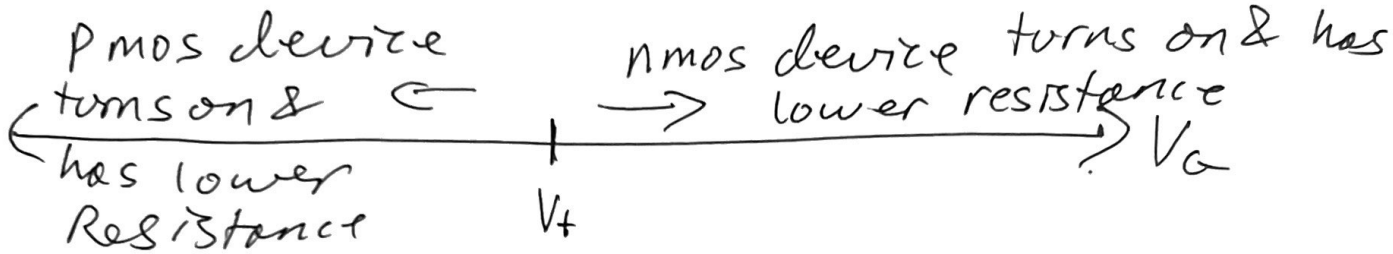




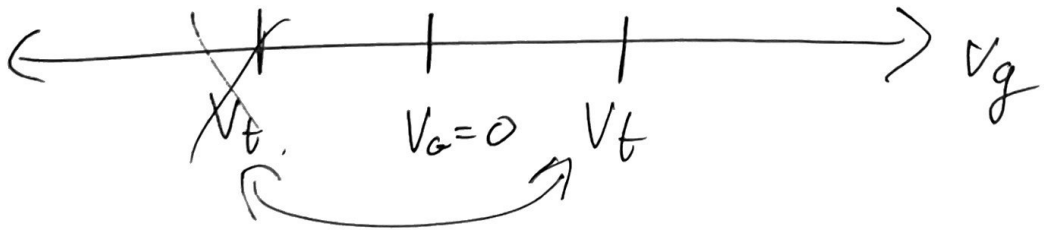
Is V_g is below the threshold voltage, then you dont short out the back to back pn junctions



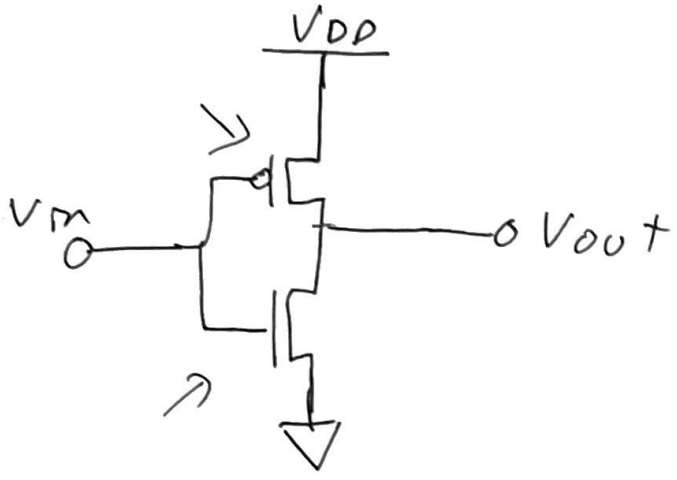




The threshold voltage, V_T, is the voltage at which the channel forms.

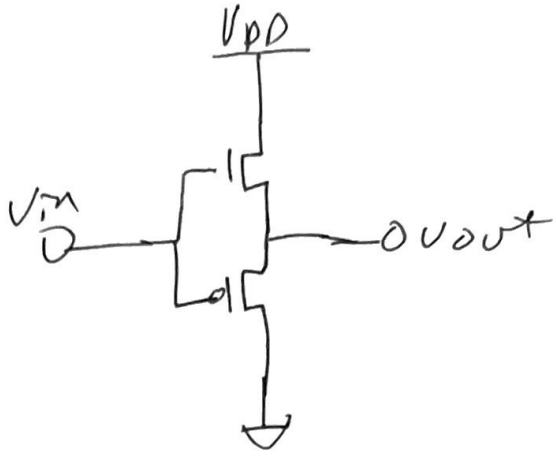


CMOS Inverter



In	out
0	1
1	0

CMOS Buffer



In	out
0	0
1	1

CmosNAnd Gate

A and B

A	B	out
0	0	0
0	1	0
1	0	0
1	1	1

A	B	out
0	0	1
0	1	1
1	0	1
1	1	0

~~Cmos Or Gate~~