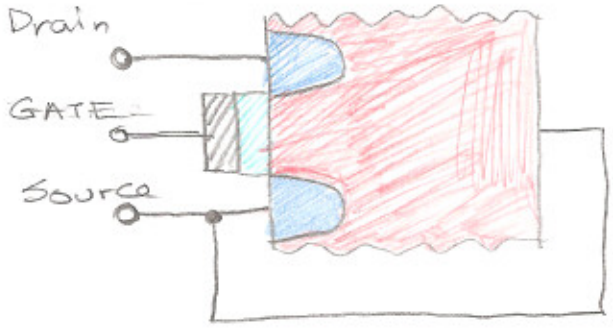
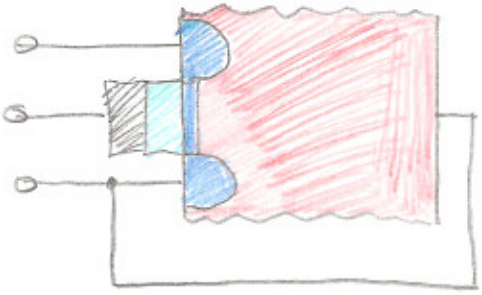
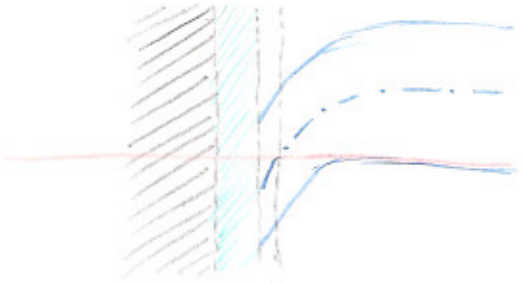
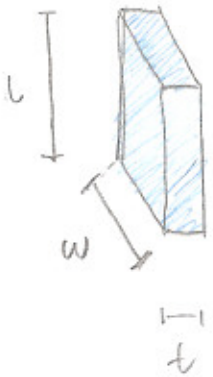






n type is formed.



(1)

$$R_{ch} = \rho_{ch} \frac{l}{w \cdot t}$$

$$I_d = \frac{V_{ds}}{R_{ch}}$$

$$I_d = \frac{V_{ds} \cdot w \cdot t}{\rho_{ch} \cdot l}$$ — P

$$I_d = P t$$

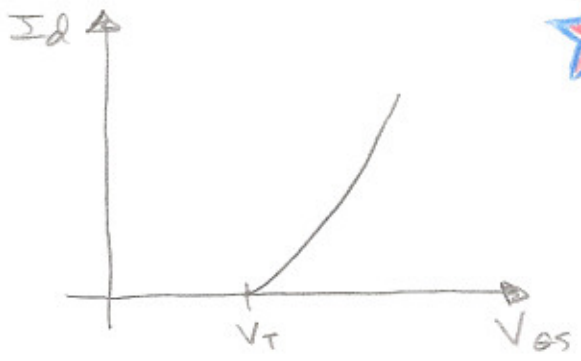
$$\frac{dI_d}{dV_{GS}} = \frac{dP}{dV_{GS}} t + P \frac{dt}{dV_{GS}}$$

$\frac{dP}{dV_{GS}} \approx 0$

$$g_{ch} = \frac{dI_d}{dV_{GS}} \approx P \frac{dt}{dV_{GS}}$$

$$\mathcal{E} = \frac{V}{d}$$

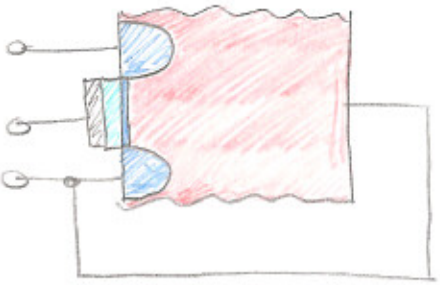
note: The electrical feild strength is much stronger if d is smaller when there is a constant voltage.

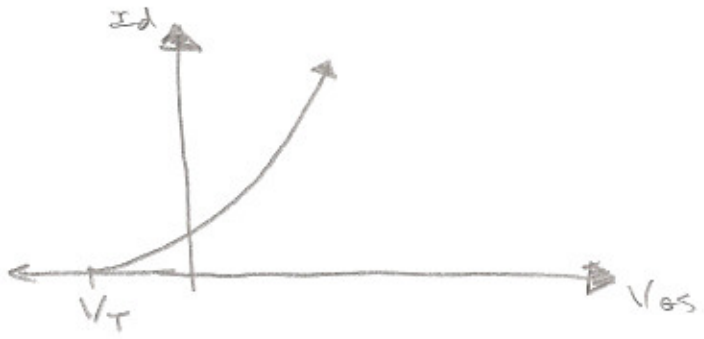


know for test.

If the area next to the dielectric is doped with n type semiconductor, then the voltage / current characteristic will change

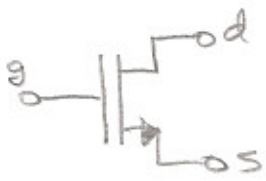
$\mathcal{E} = 0$

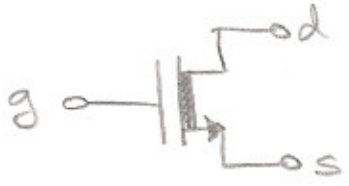




note: this extra n doping is n^-, the concentration is very low.

This is an N channel MOSFET having ions injected channel



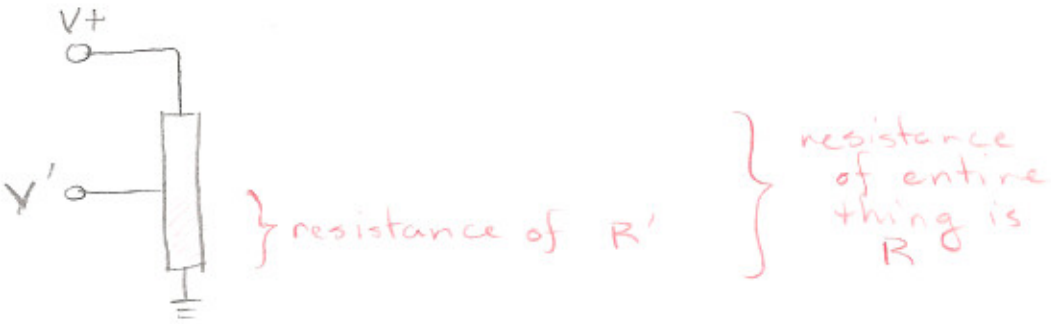


(having injected channel)

note: P channel MOSFET is similiar but with reverse voltage.

Refrancing (1)

This remains true when V_{DS} is small,



$$V'' = V^+ - V'$$

$$V_{out} = V' = \frac{V+}{R} \cdot R'$$

$$V'' = V+ - \frac{V^+}{R} \cdot R' = V^+\left(\frac{R-R'}{R}\right)$$

$$= \frac{V^+}{R}\underbrace{(R-R')}_{\Delta R}$$

if $R' = 0$ $\quad R = \Delta R$

if $R' = R$ $\quad \Delta R = 0$