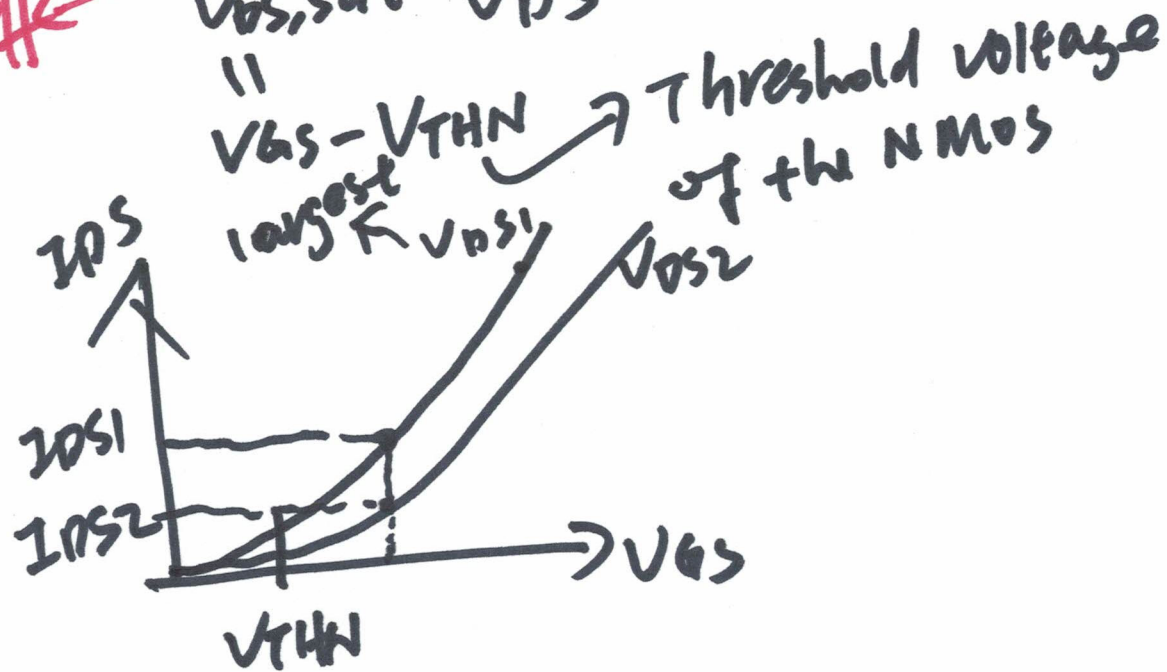
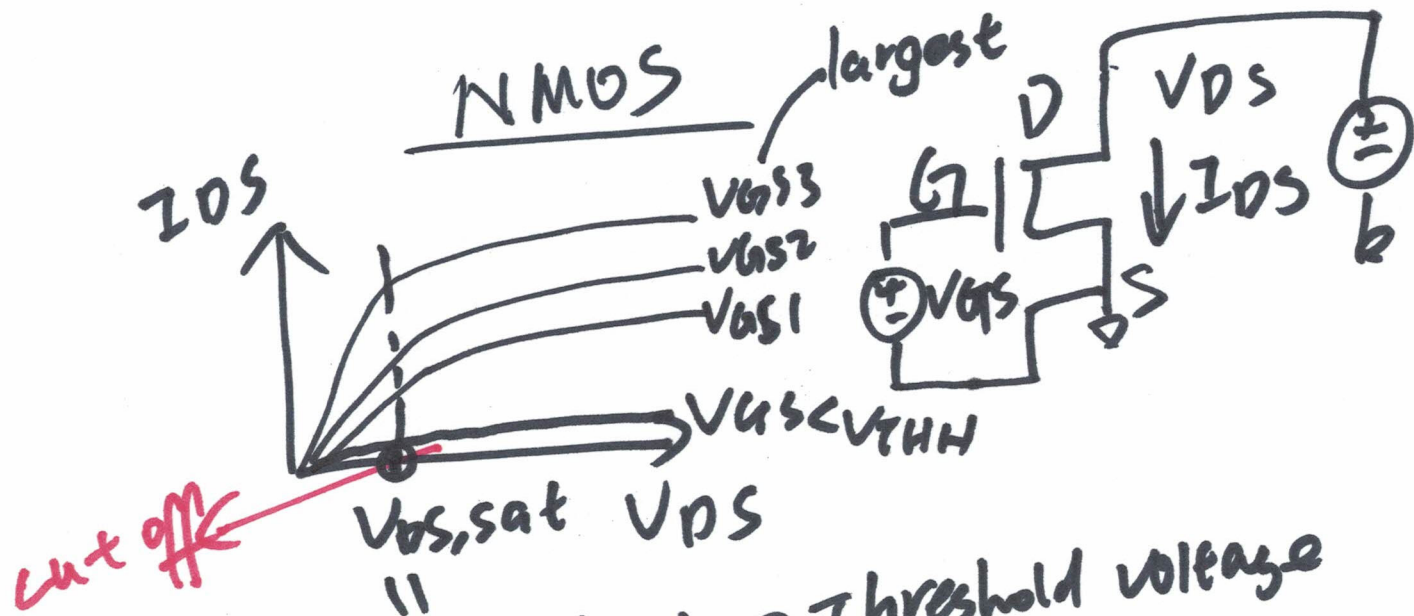
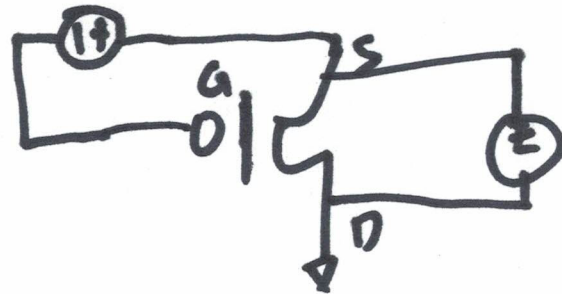


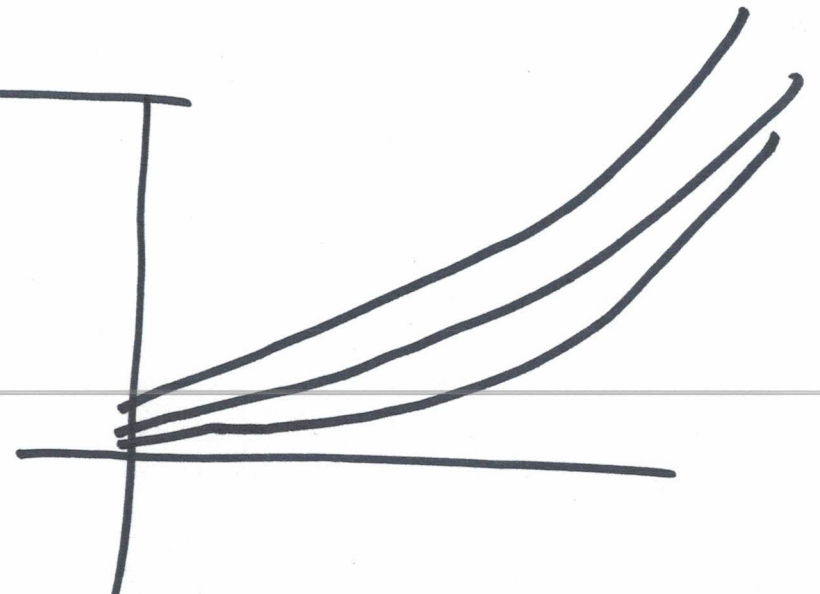
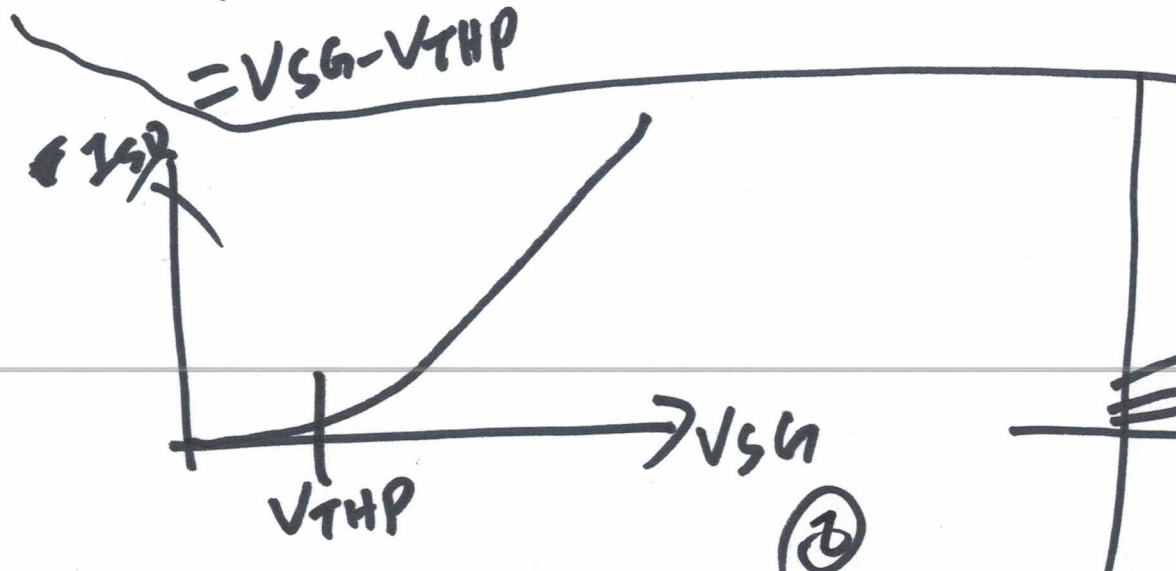
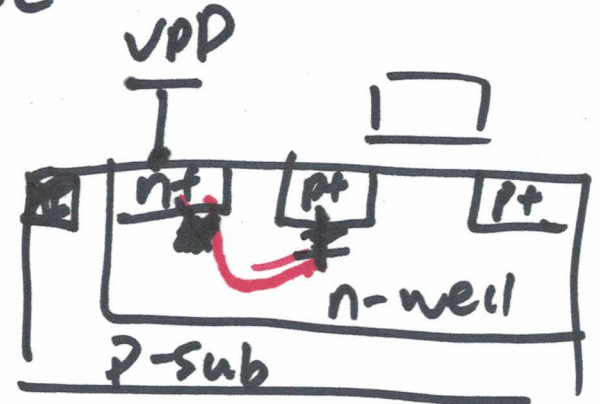
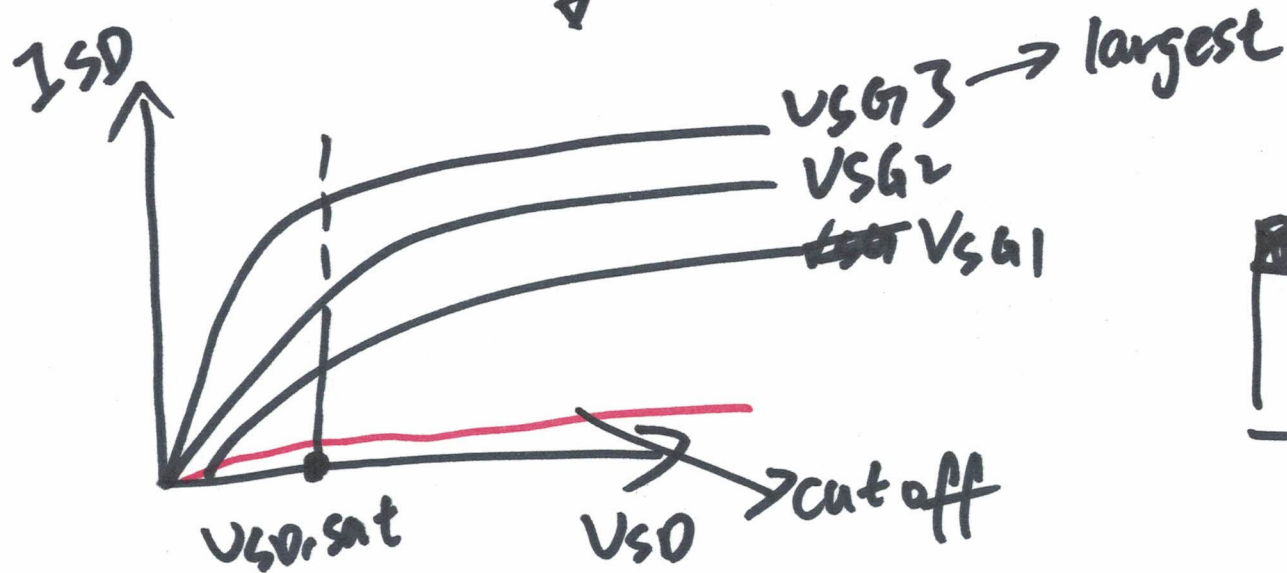


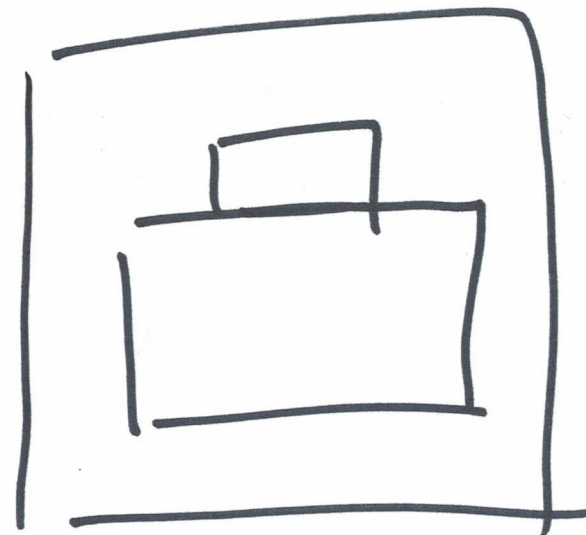
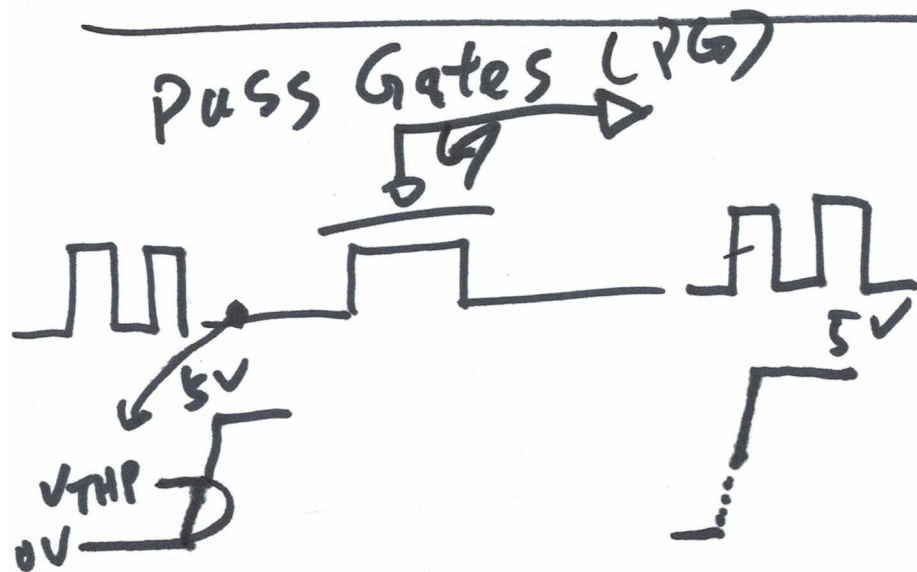
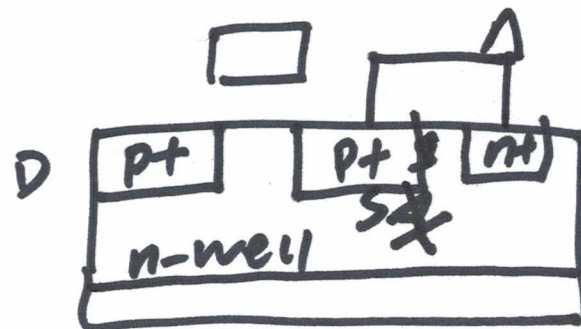
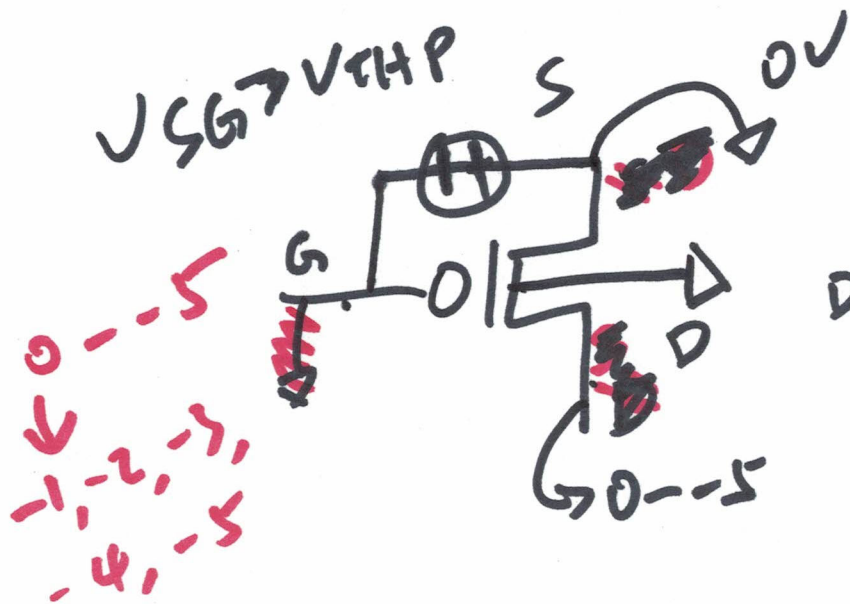
V_{SG} PMOS



$$V_{THP} = 0.9V$$

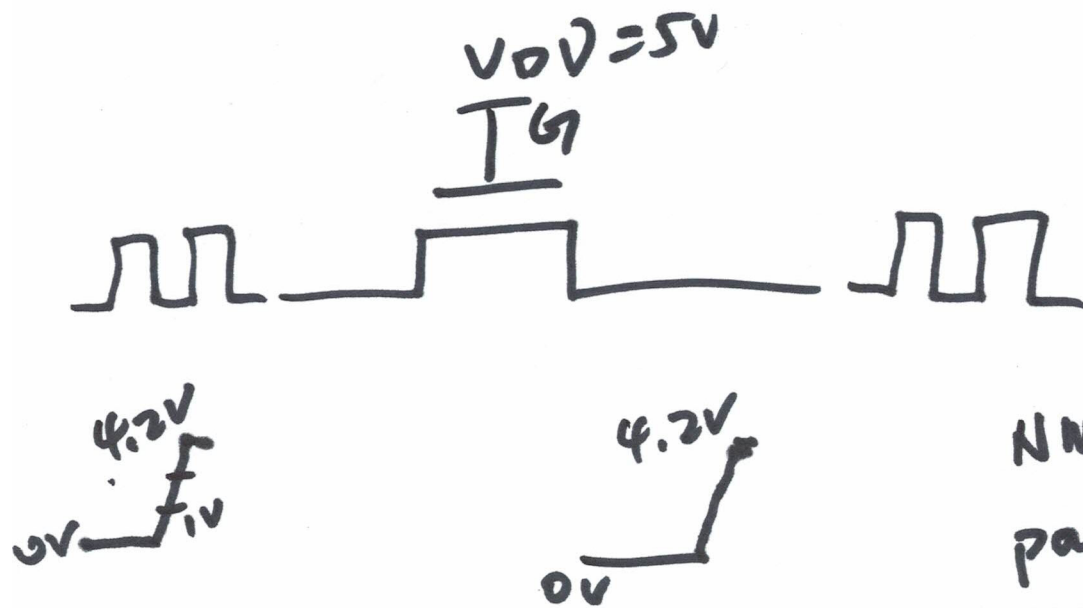
$$V_{SG} > 0.9V$$





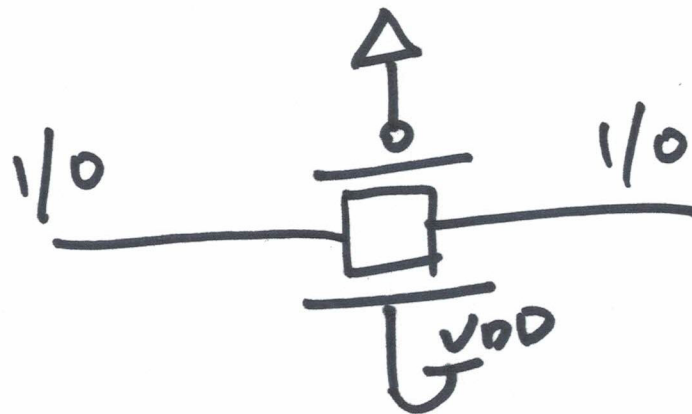
Digital circuits
0/1

PMOS is good at
passing 1's.

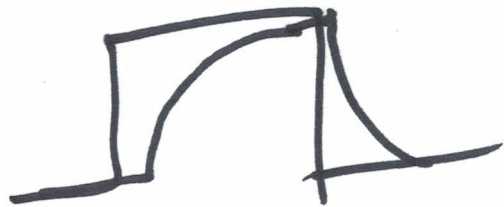


NMOS is good at passing 0's

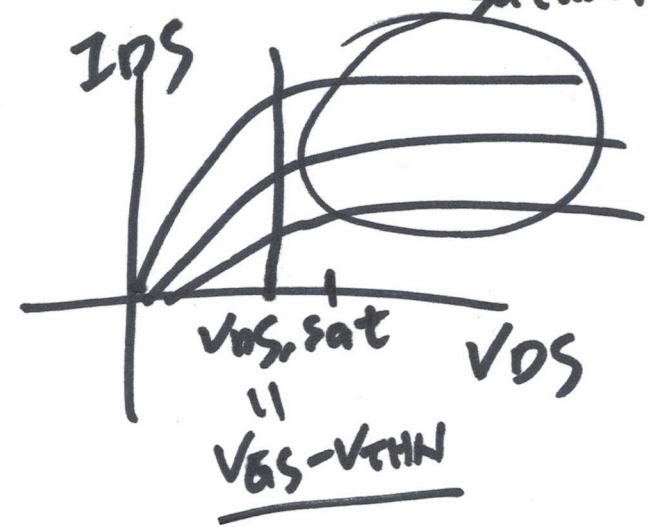
Transmission Gate (TG)



CMOS
Complementary MOS



Diode Connection of the PMOS/NMOS saturation



Both transistors are operating in the saturation region.

(Square Law equation)

$$I_{DS} = \frac{K_P \mu}{2} \frac{W}{L_{min}} (V_{GS} - V_{THN})^2$$

$I_{DS} \uparrow$ Driving Capability

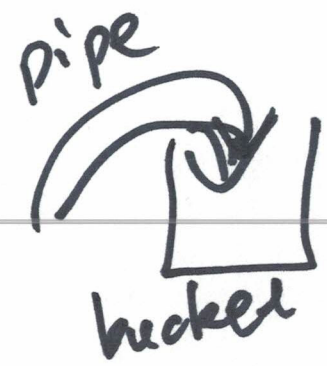
$$\frac{W}{L_{min}}$$

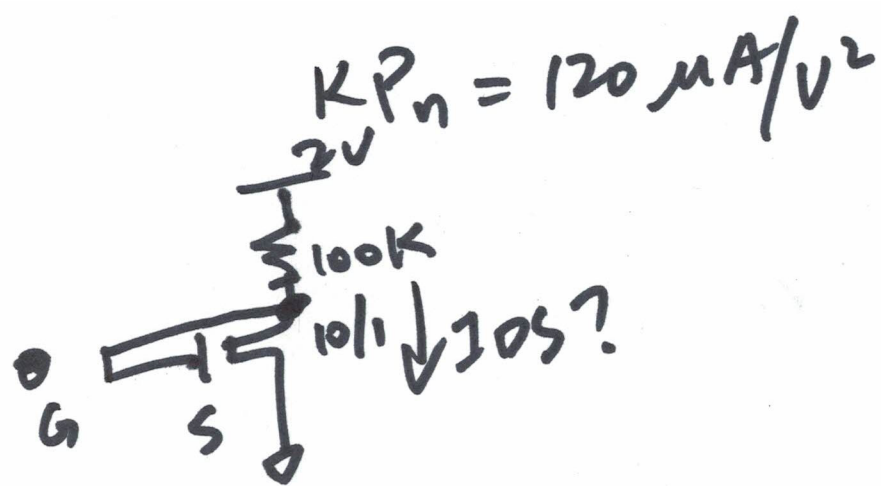
$$2\lambda = 2 \times \frac{300nm}{} = 600nm > \underline{500nm}$$

$$V_{DS, sat} = V_{GS} - V_{THN}$$

$$V_{GS} = V_{GS} \uparrow$$

$$V_{DS} > V_{DS, sat}$$





$$I_{DS} = \frac{K P_n}{2} \frac{W}{L} (V_{GS} - V_{THN})^2$$

$$\frac{2V - V_{GS}}{100k} = \underline{\underline{10S}}$$

$$V_{GS} = V_G - 0 = V_G - V_S = V_D$$

$$V_{GS} = 0.933V$$

$V_{THN} = 0.8V$

$$\underline{\underline{V_{GS}}} = \begin{cases} 0.933V \\ 0.65V \end{cases}$$

(b)