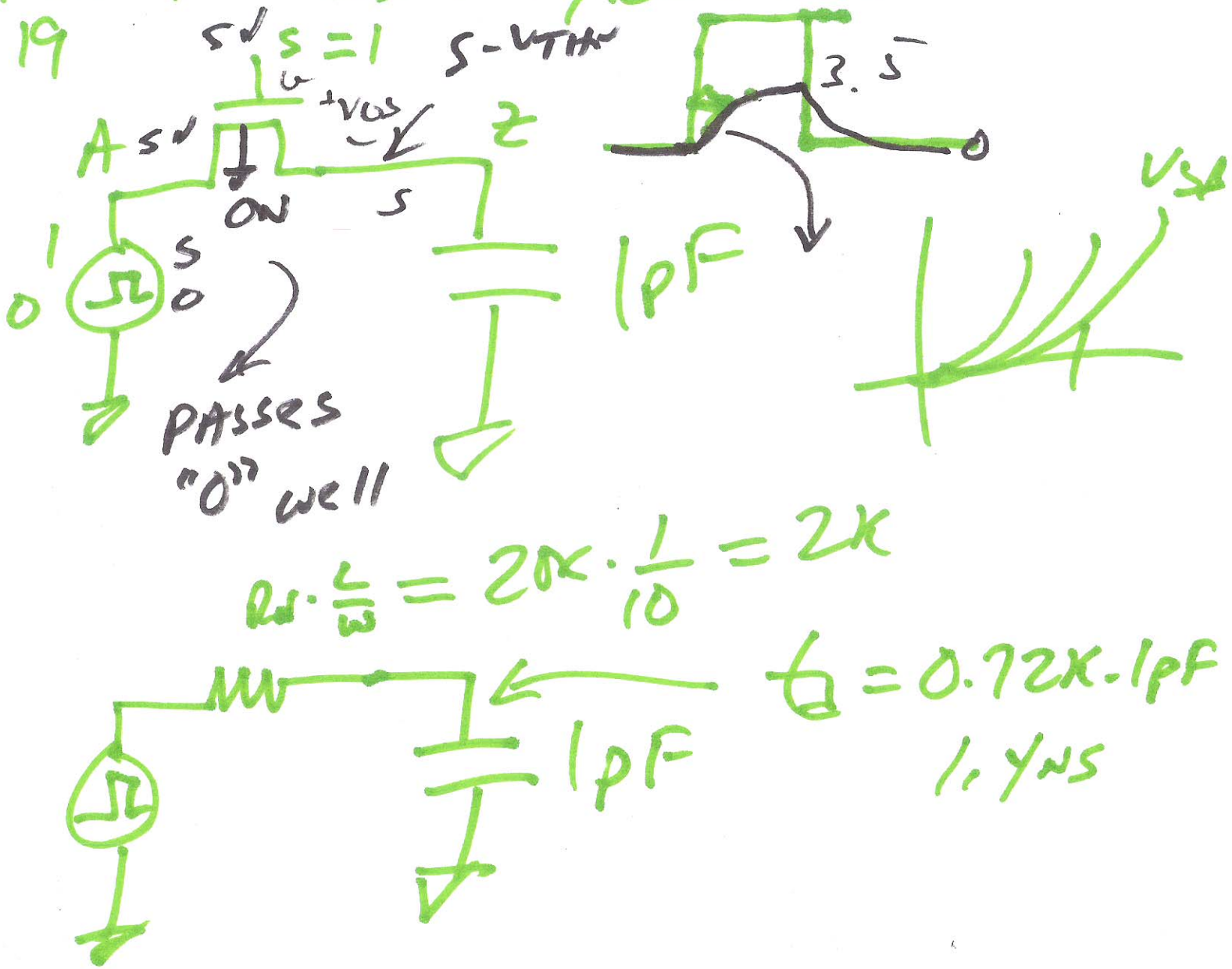
Oct. 29, 2014 EE421/ECG62

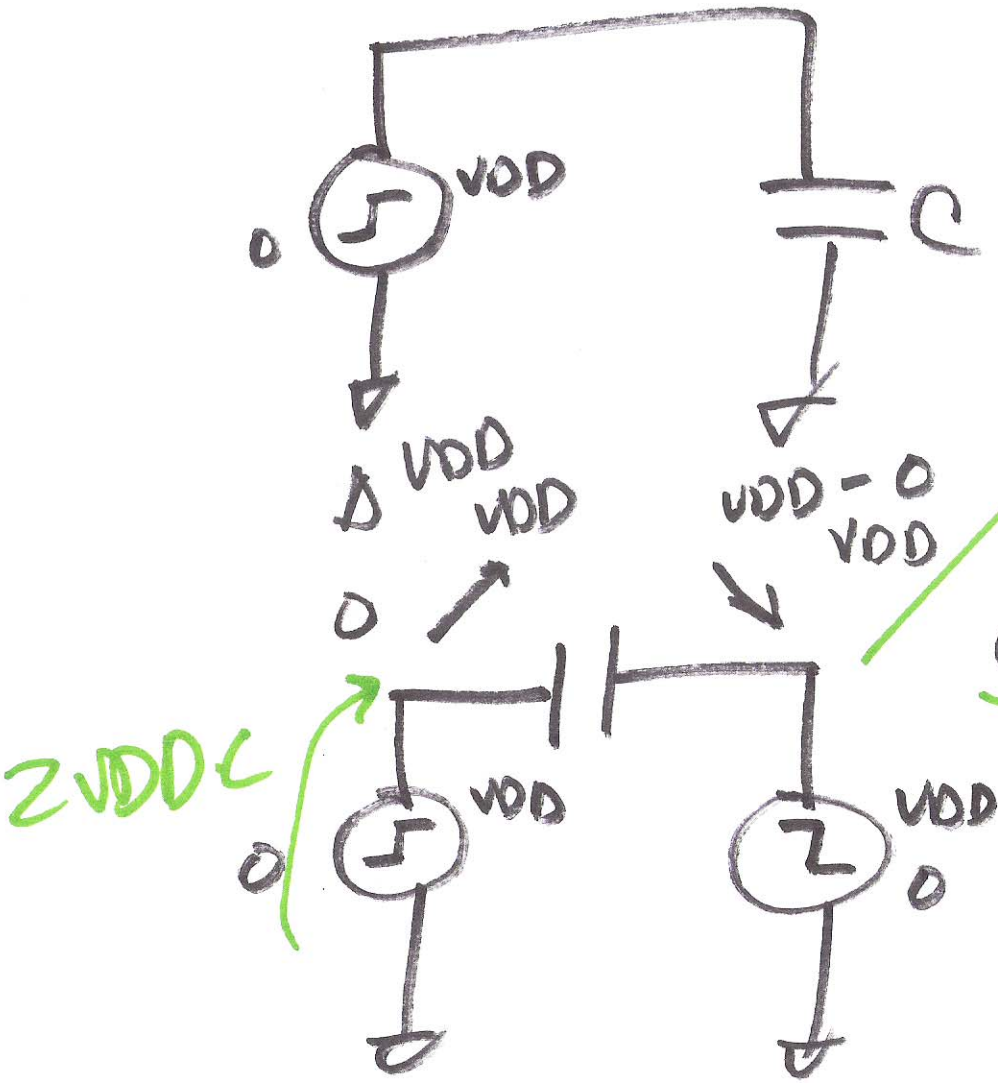
Lecture 19



$R_{eq} \cdot \frac{L}{W} = 2K \cdot \frac{1}{10} = 2K$

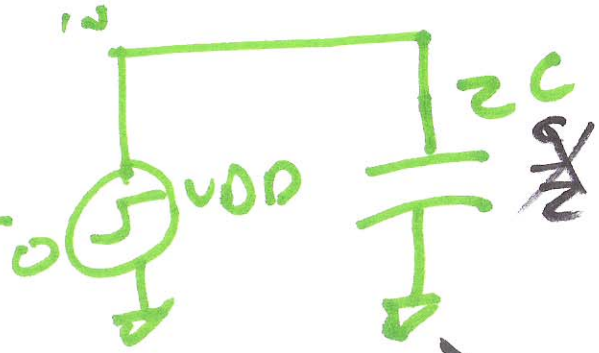
$t_d = 0.72K \cdot 1pF$

$1.4ns$



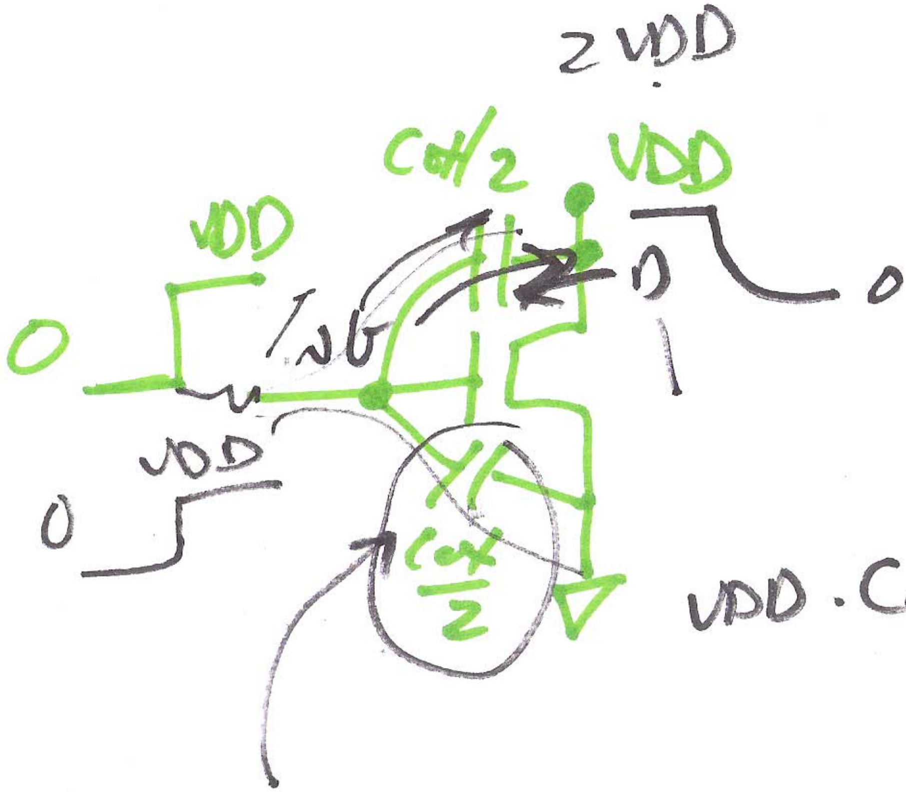
$$Q = C \cdot VDD$$

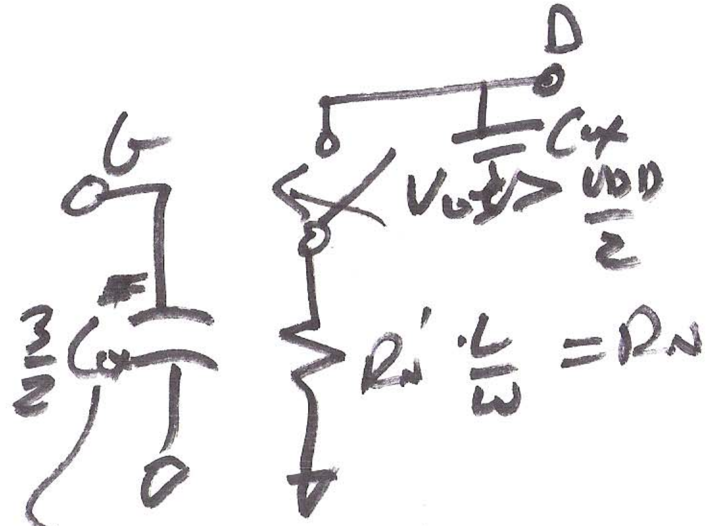
$VDD \cdot \frac{1}{2}$



$$Q = C\left(\frac{VDD - VDD}{2}\right)$$

$$Q = 2VDD \cdot C$$

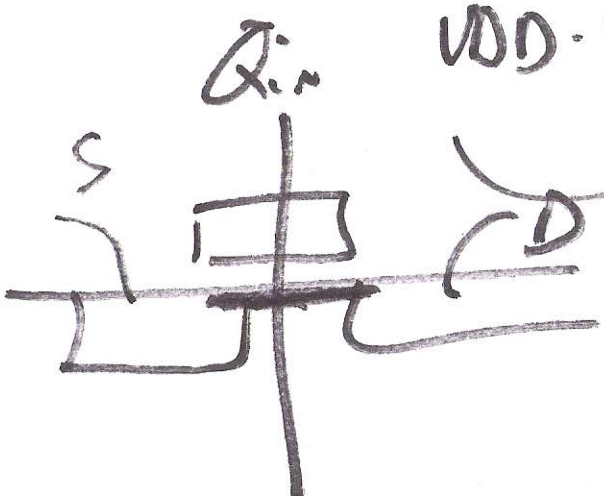


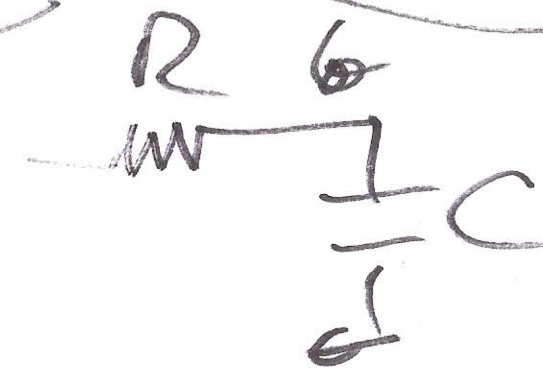


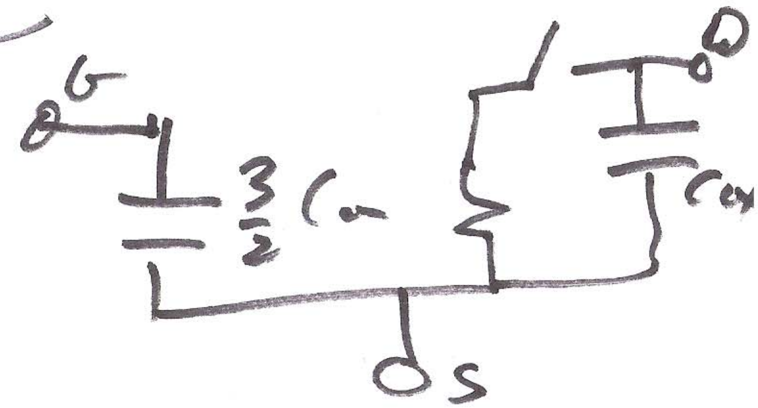
$VDD \cdot C_{ox}$

$$C_{ox} = C'_{ox} \cdot L \cdot W$$

$$VDD \cdot \frac{C_{ox}}{2} + VDD \cdot 2 \, \frac{C_{ox}}{2} = VDD \cdot \frac{3}{2} C_{ox}$$

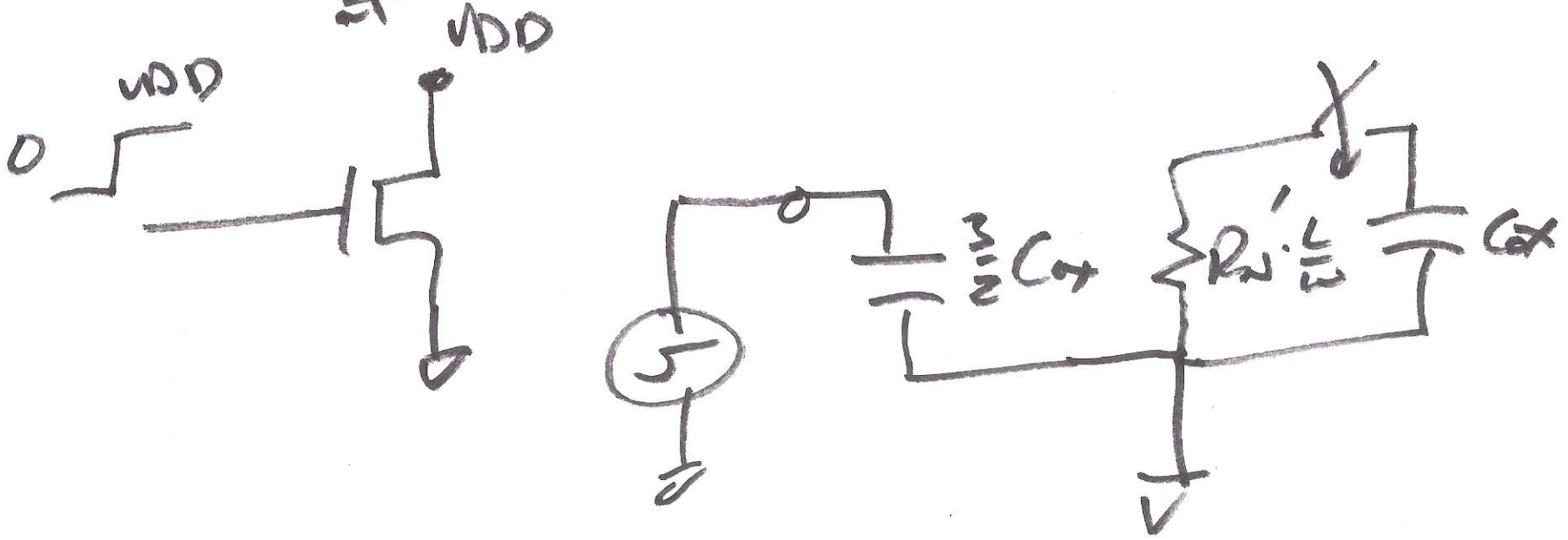






Process characteristic

initially time constant



$$\tau_N = R_N \cdot C_{ox} = R_N' \cdot \frac{L}{W} \cdot C_{ox}' \cdot W \cdot L$$

For high-speed $\frac{VDD \cdot L^2}{\frac{\mu_N C_{ox}'}{2}(VDD - V_{THN})^2} \cdot C_{ox}''$

$L \rightarrow$ small!

$\mu_N \rightarrow$ Big

$VDD \rightarrow$ Big