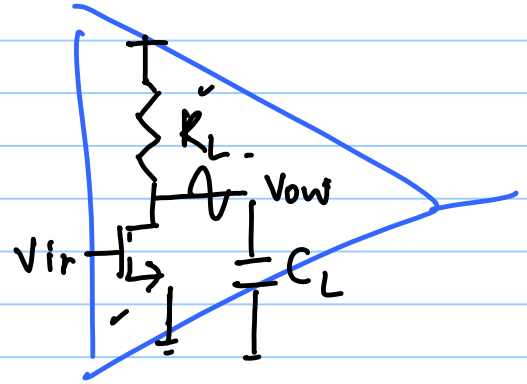
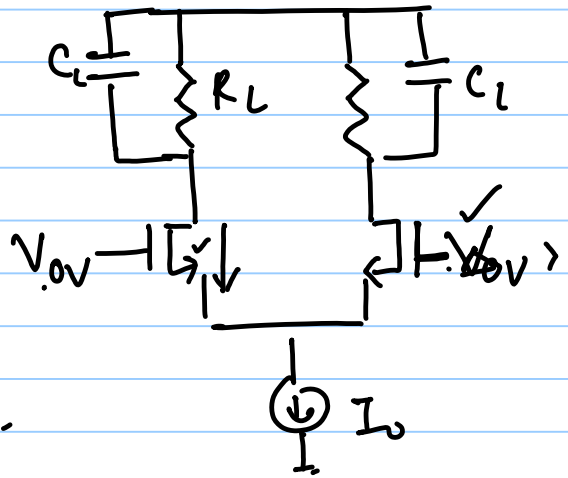
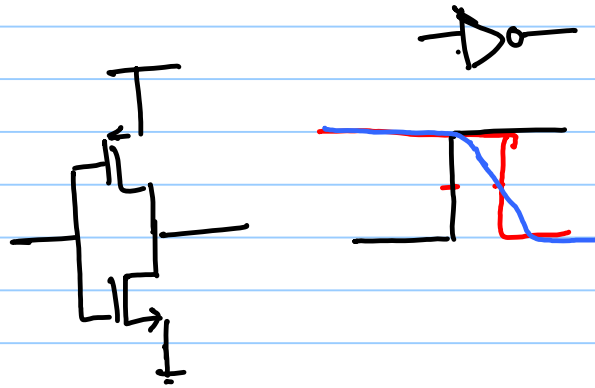
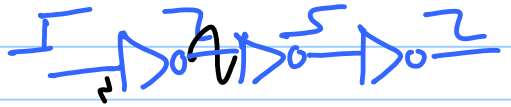
Lecture #26

Note Title 26-09-2018

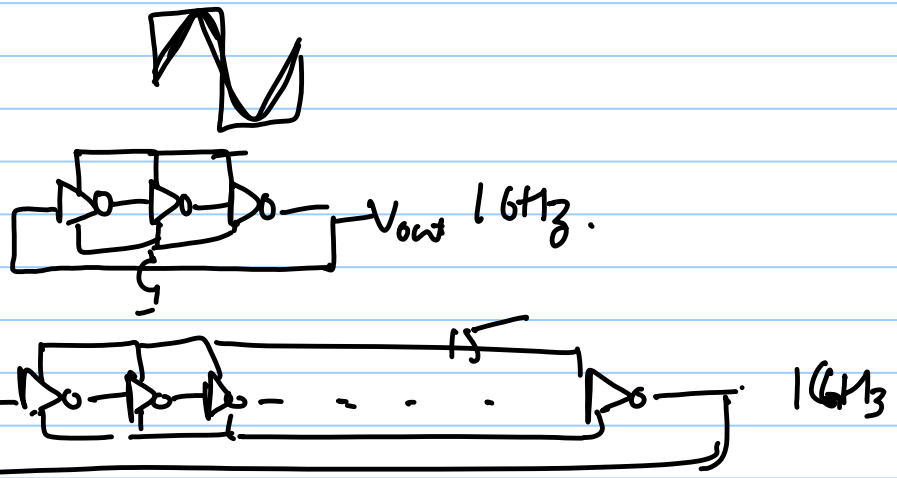


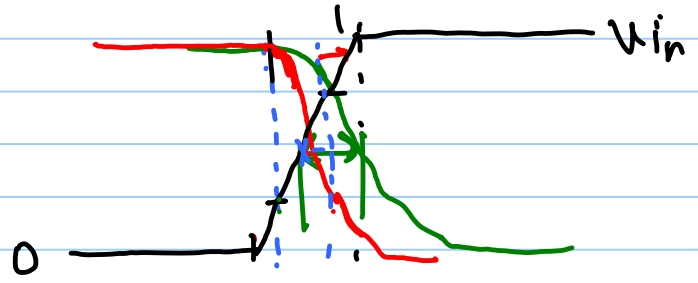


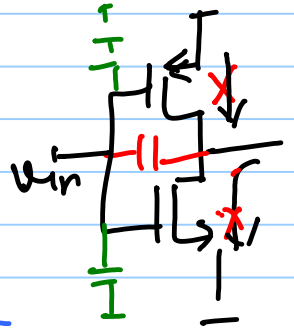




$$\begin{cases} \angle LG = 2n\pi \\ |LG| = 1 \end{cases}$$



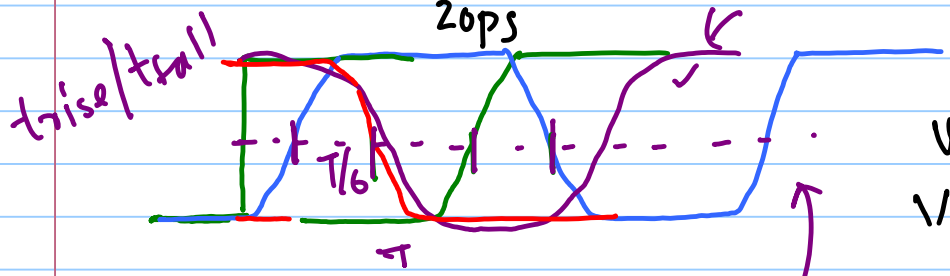




V_{OV}

PMOS $V_{DD} - |V_{TP}|$

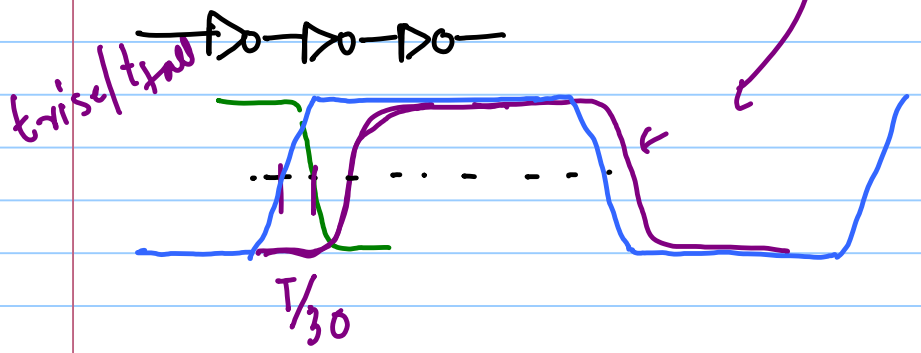
NMOS



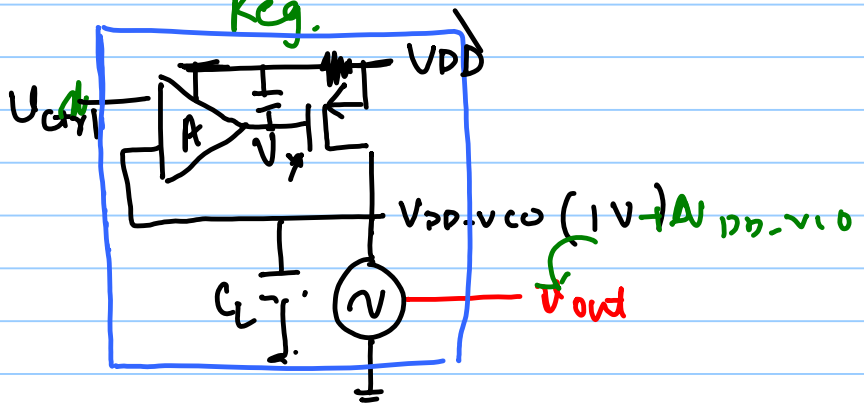
$V_{in} = V_{DD}$

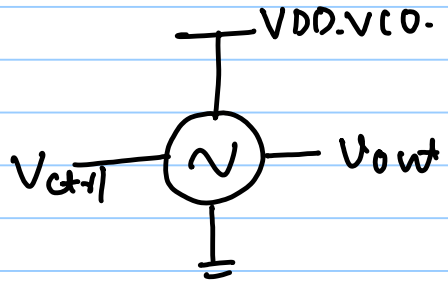
$V_{ov,nmos} = V_{DD} - V_{tn}$, $V_{DS} = 0$.

$V_{ov,pmos} = V_{DD} - V_{DD} - |V_{TP}| < 0$



PSRR



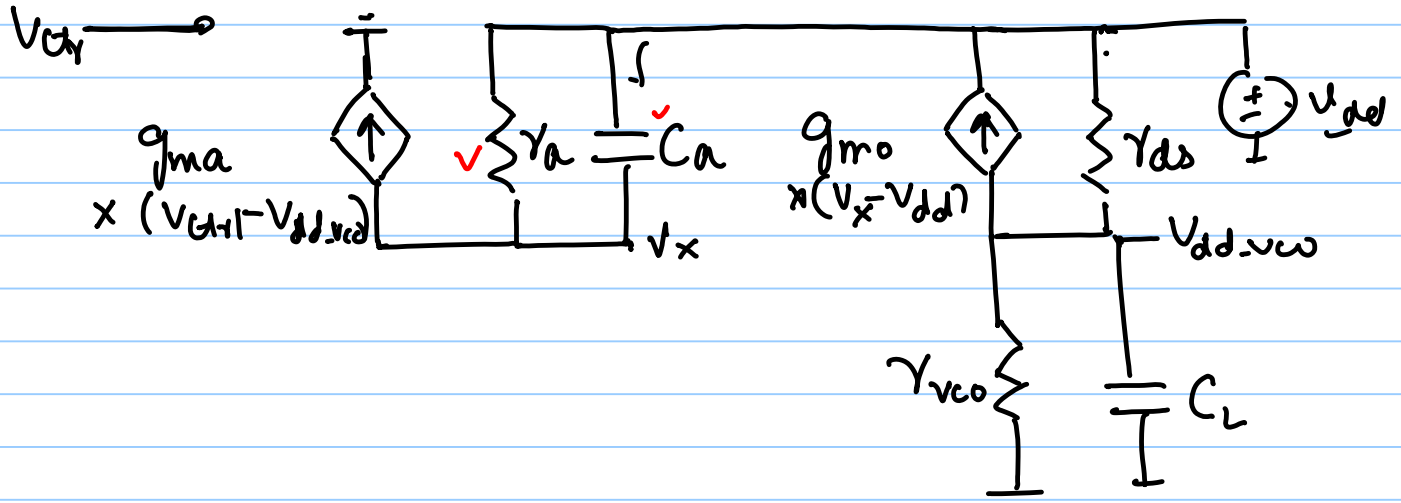


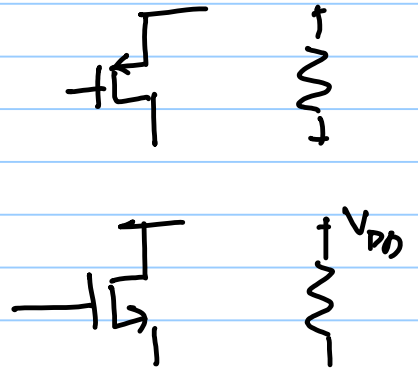
$$\frac{V_{DD\_VCO}}{V_{Ctrl}} = H(s)$$

$$V_{out} = A \sin\left(\omega_{free} t + 2\pi K_{VCO} \int V_{Ctrl} \cdot dt\right)$$

$$V_{out} = A \sin\left(\omega_{free} t + 2\pi K_{VCO} \int (V_{Ctrl} * h(t))\, dt\right)$$

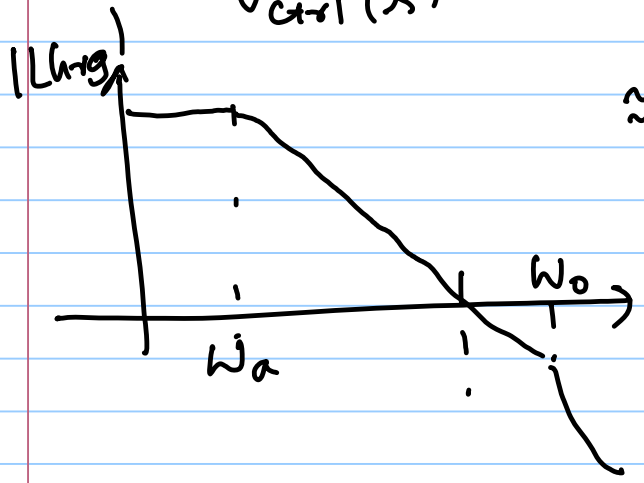
$$L.h(s) = \frac{1}{2\pi} I_{cp} (R + 1/sC) \frac{2\pi K_{VCO}}{s} \times \frac{1}{(1 + s/\omega_{reg})}$$





$$\frac{V_{dd\_vco}(s)}{V_{Ctrl}(s)} = \frac{L_{hreg}}{1 + L_{hreg}} \approx \frac{1}{(1 + s/\omega_{reg})}$$

$$L_{hreg} = \frac{(g_{ma} r_a)(g_{mo} r_o)}{(1 + s/\omega_a)(1 + s/\omega_o)}$$



$$\omega_a = \frac{1}{r_a C_a}$$

$$\omega_o = \frac{1}{(r_{ds} \| r_{vco}) C_L}$$