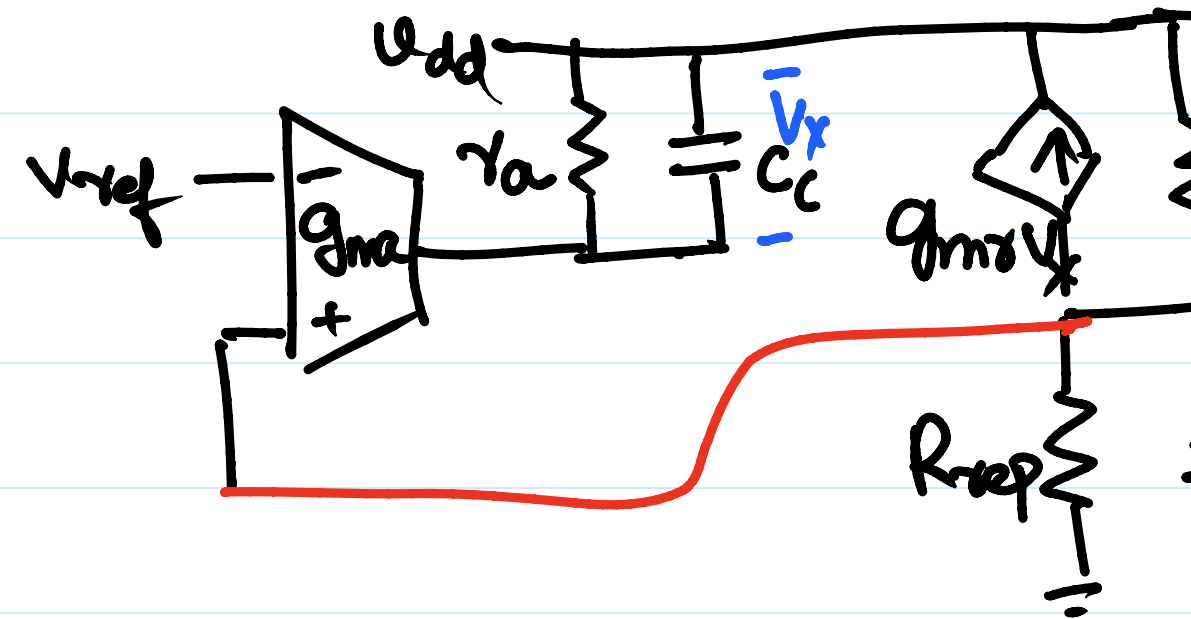
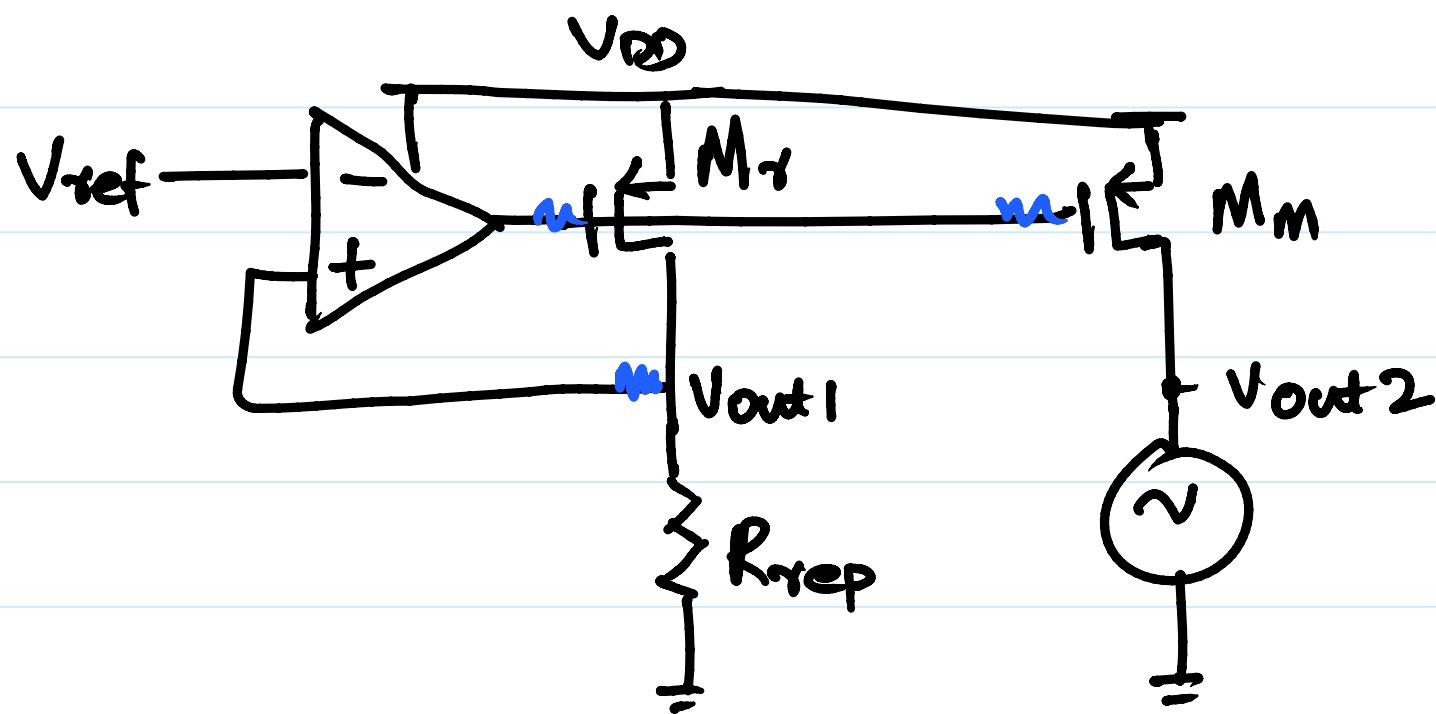


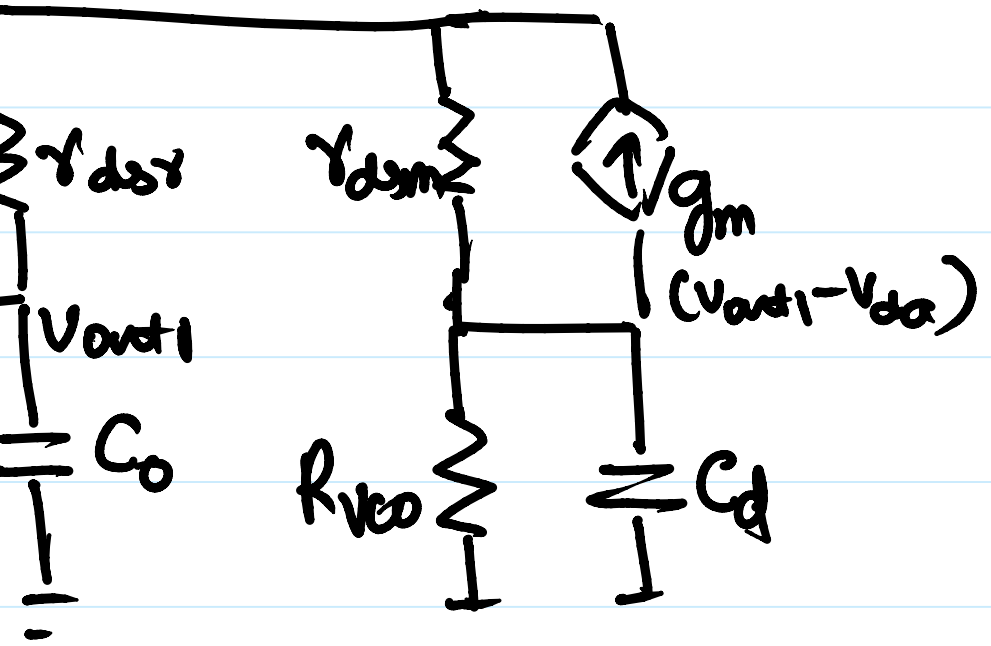
Replica-biased LDO



$$\frac{V_{out1}}{V_{DD}} = \frac{S_{VDD}}{(1 + s/\omega_0) [1 + LC_{rep}]}$$

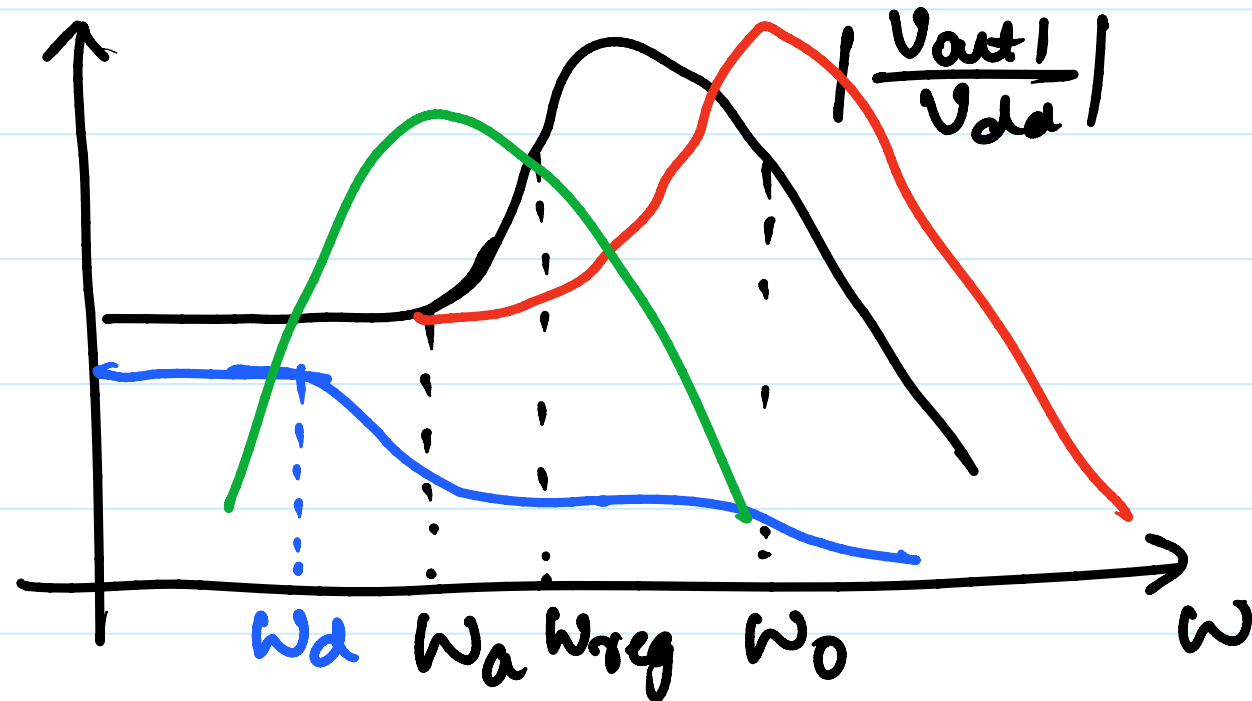
$$S_{VDD} = \frac{R_{rep}}{R_{rep} + Y_{dsx}}, \quad \omega_a = \frac{1}{Y_a C_c}, \quad \omega_0 = \frac{1}{(Y_{dsx} || R_{rep})}$$

$$LC_{rep} = \frac{A_u A_o}{\dots}$$



C_0

$$(1 + s/\omega_a) (1 + s/\omega_0)$$



$$\left| \frac{V_{out2}}{V_{out1}} \right| = \frac{g_m (r_{ds1} \parallel R_{vc0})}{1 + s/\omega_d} ; \omega_d = \frac{1}{(r_{ds1} \parallel R_{vc0})}$$

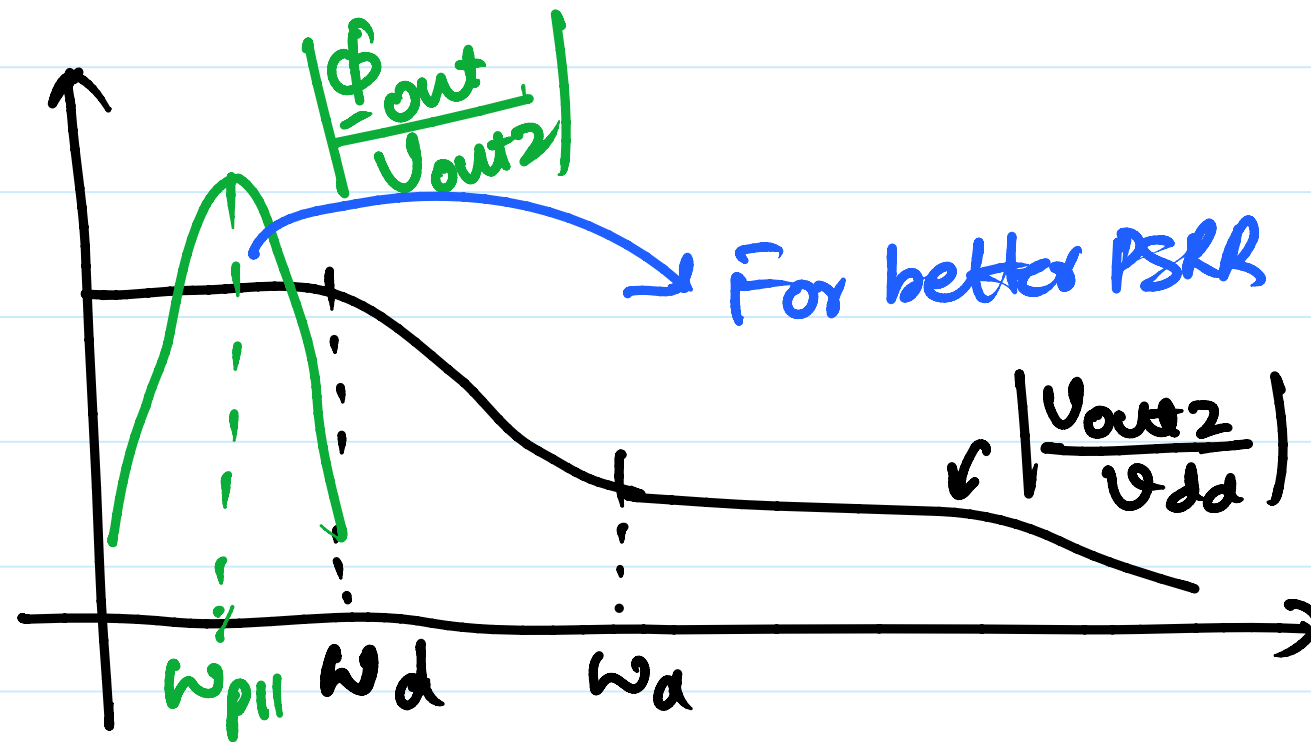
$$-g_m (V_{out1} - V_{dd}) + \frac{(V_{dd} - V_{out2})}{r_{ds1}} = V_{out2} \left(\frac{1}{R_{vc0}} + \right.$$

$$\frac{V_{out2}}{V_{dd}} ?$$

o) Cd

s(Cd)

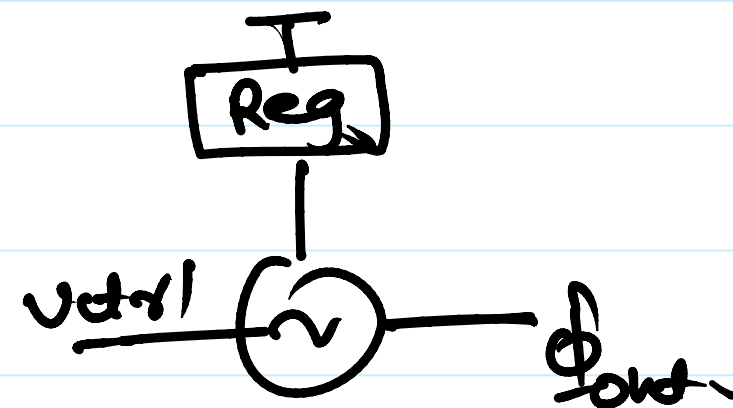
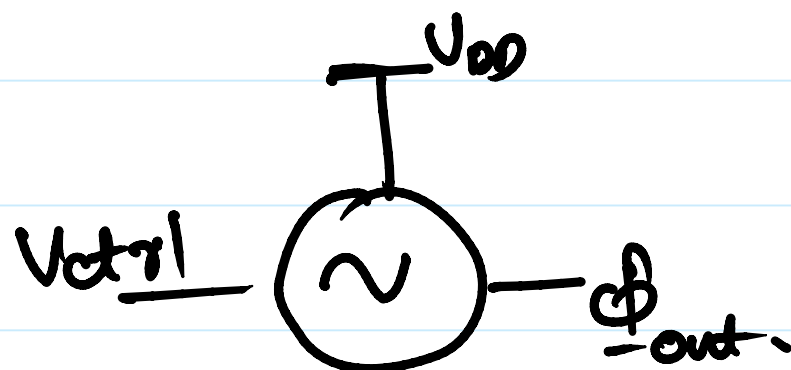
$$-g_m \left(\frac{V_{out1}}{V_{dd}} - 1 \right) + \frac{1}{r_{dsn}} \left(1 - \frac{V_{out2}}{V_{dd}} \right) = \frac{V_{out2}}{V_{dd}} \left(\frac{1}{R_{LCO}} \right)$$



For better PSRR $\rightarrow \omega_{p11} > \omega_d$ (regulator BW)

For stability $\rightarrow \omega_{p11} < \omega_d$

Can we decouple regulator BW w/ PI BW?



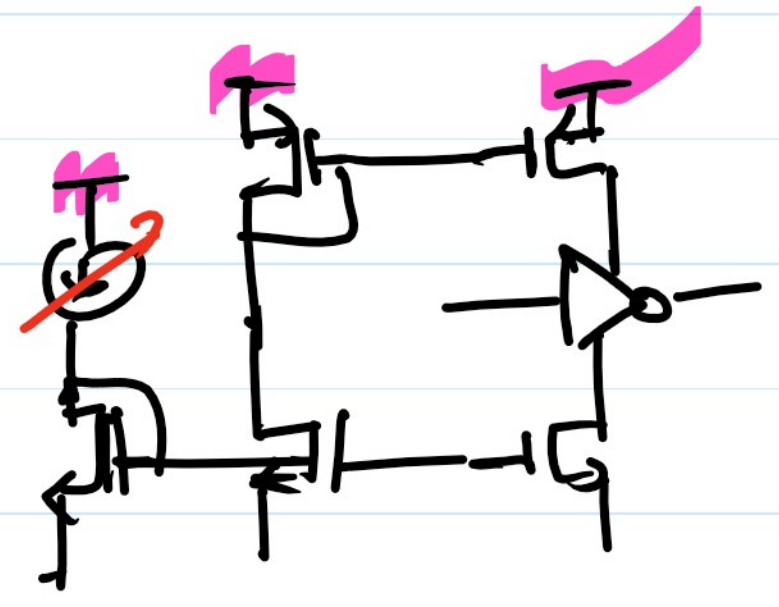
V_{dd}

$f(s(d))$

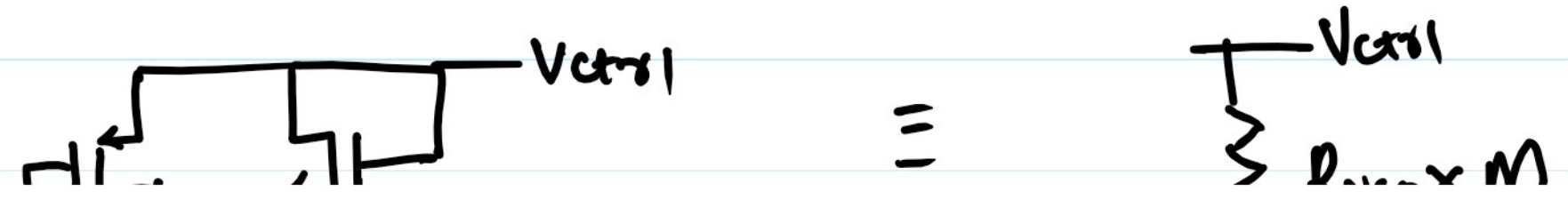
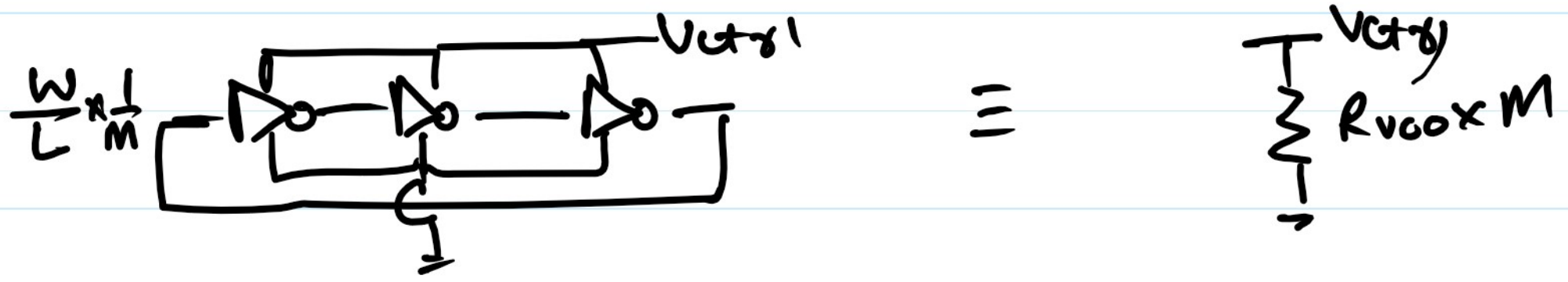
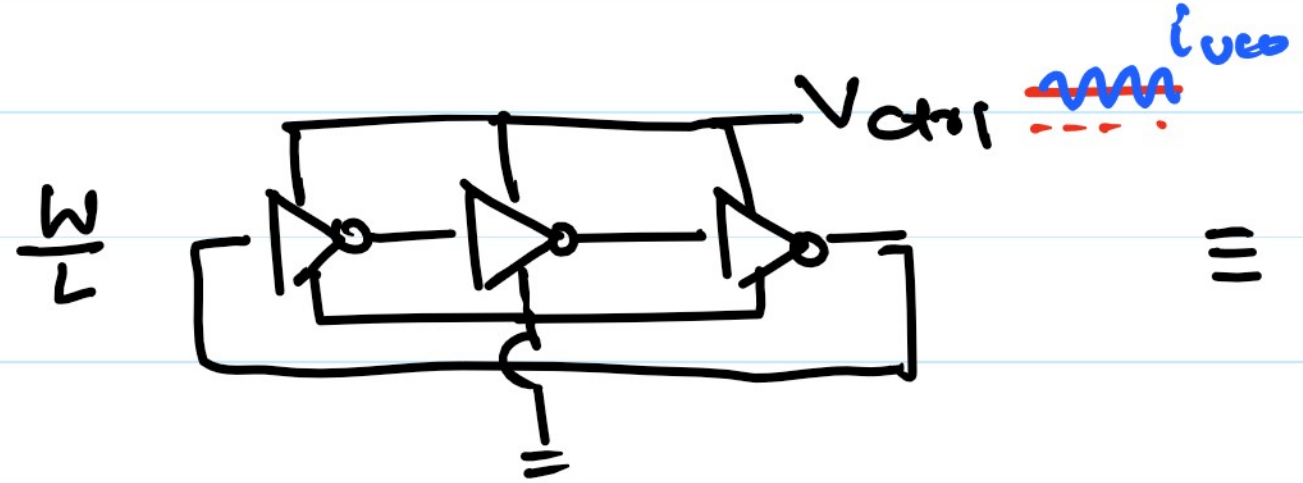
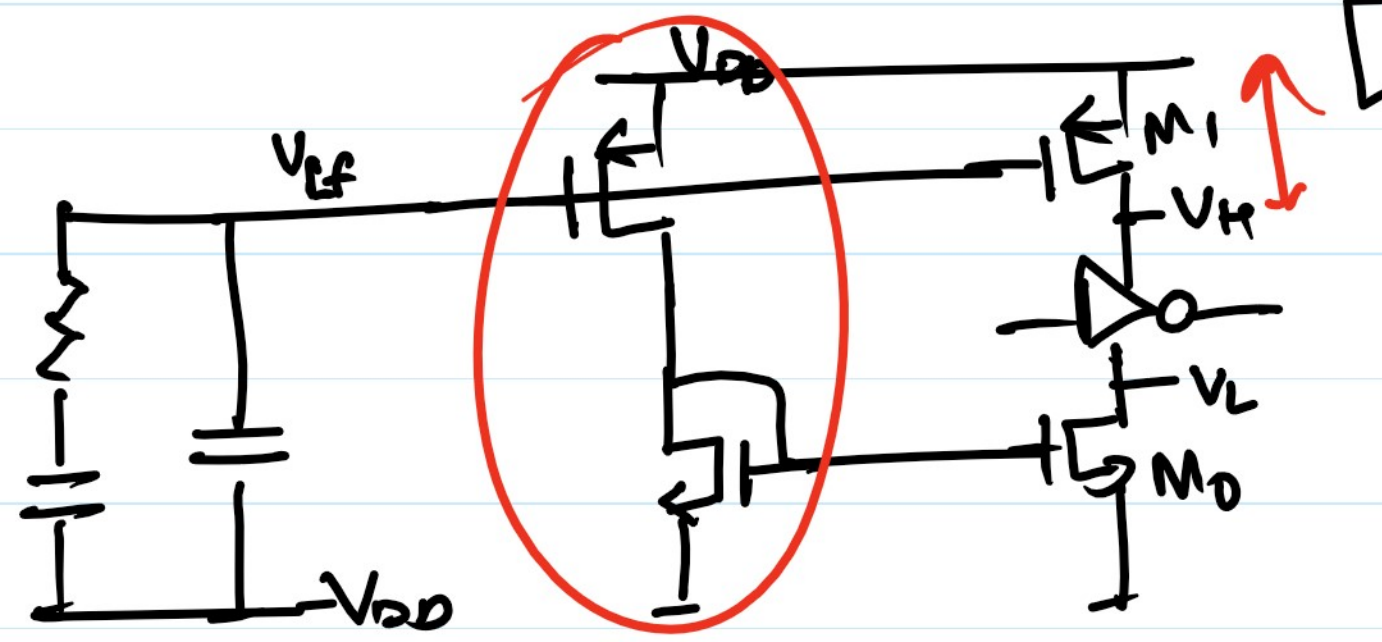
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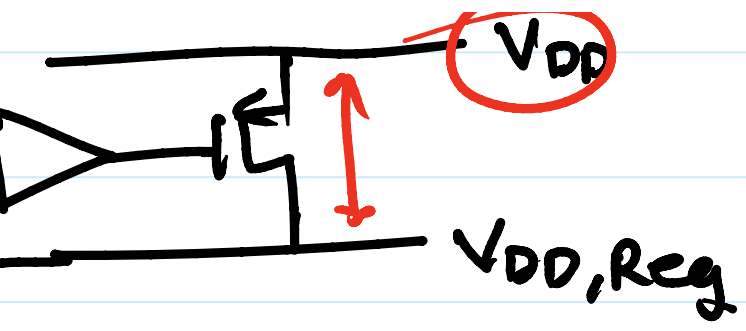


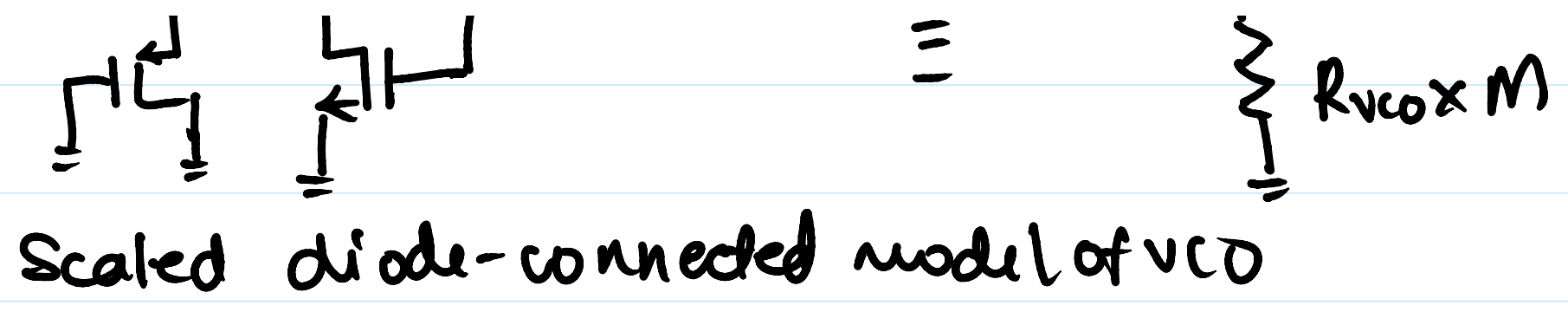
ϕ_{out}



ϕ_{out}







Scaled diode-connected model of VCO
