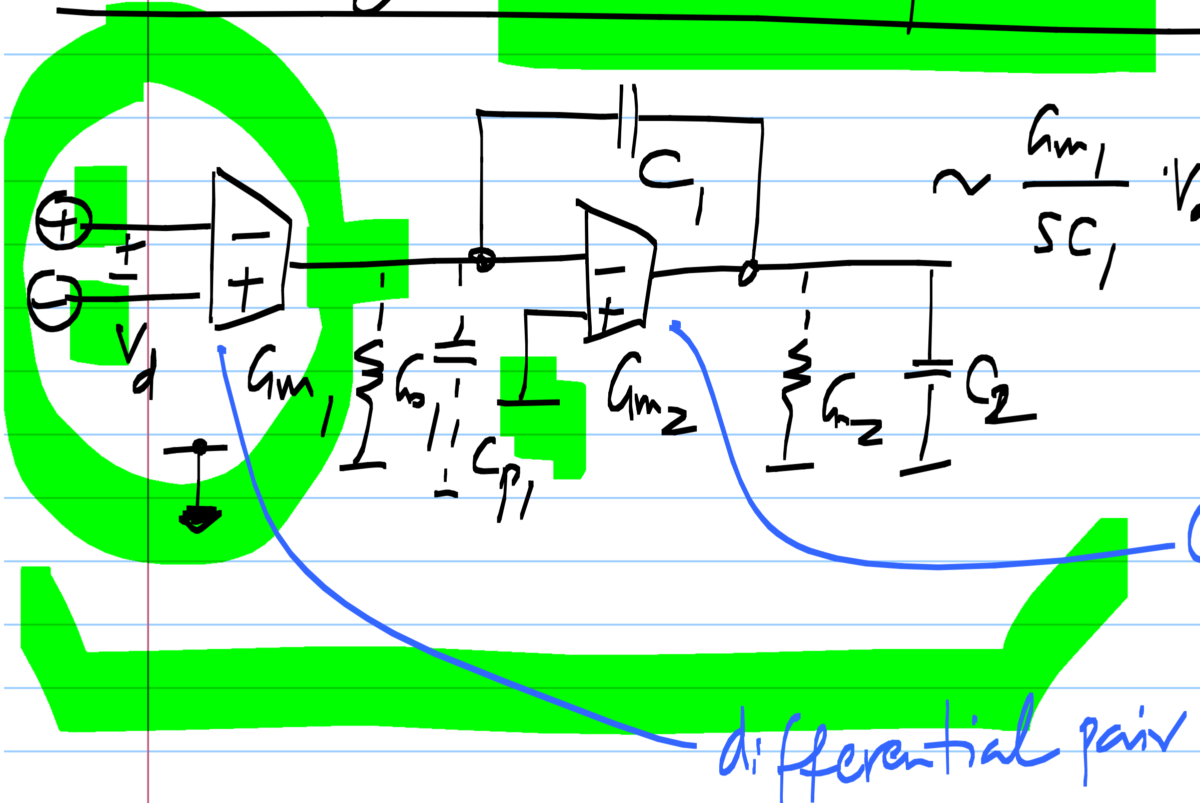
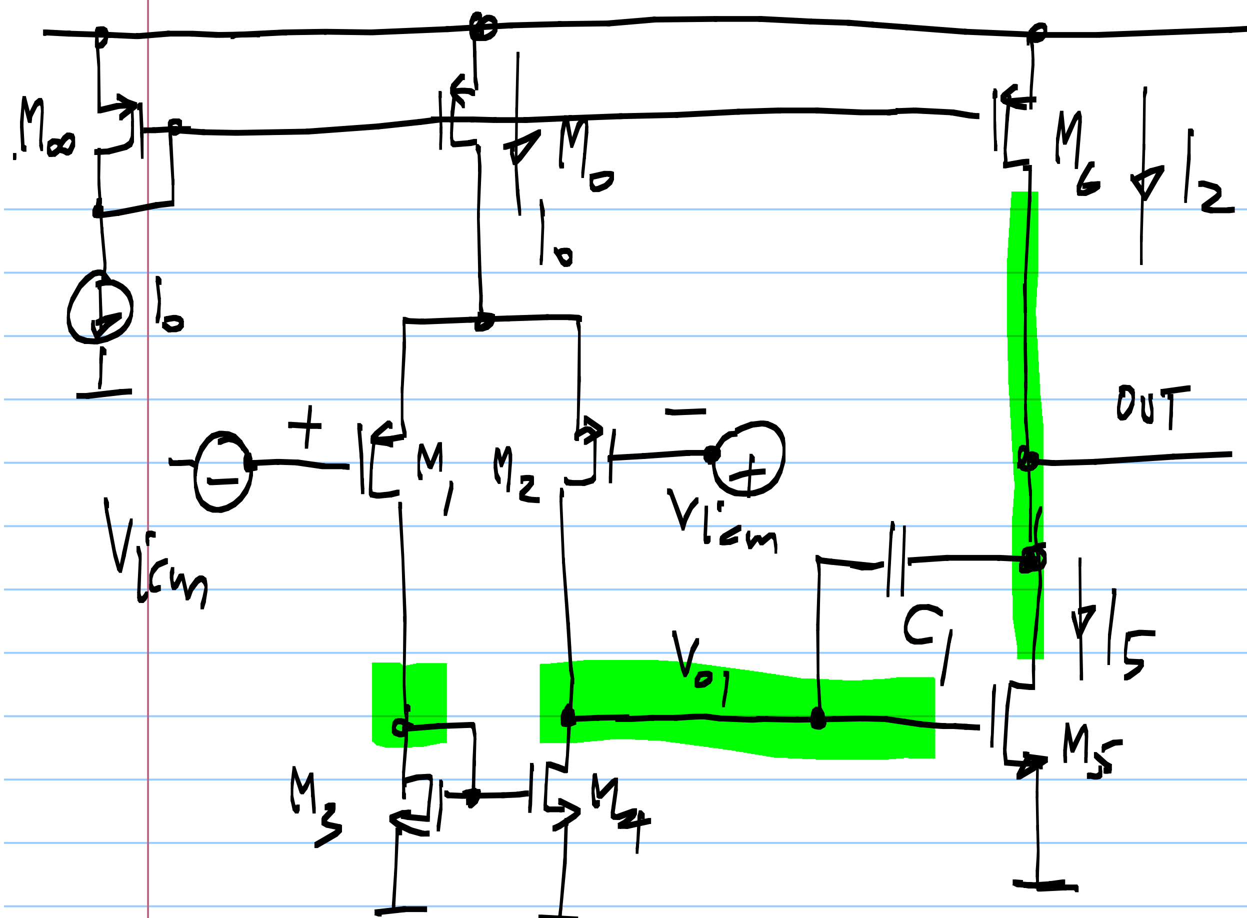
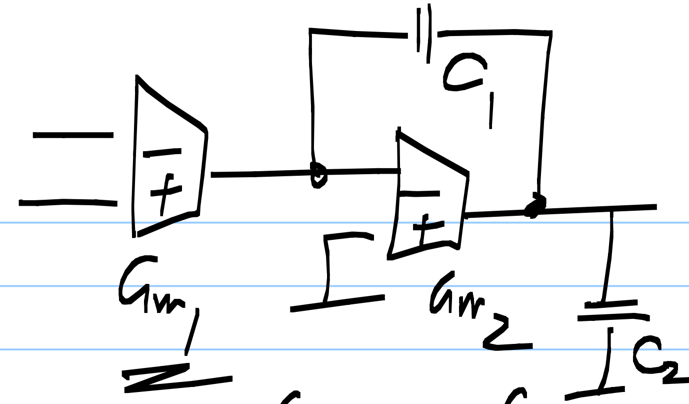
Lecture 29 16/3/2016

Two-stage miller compensated opamp.



$$\sim \frac{G_{m1}}{sC_1} \cdot V_d(s)$$



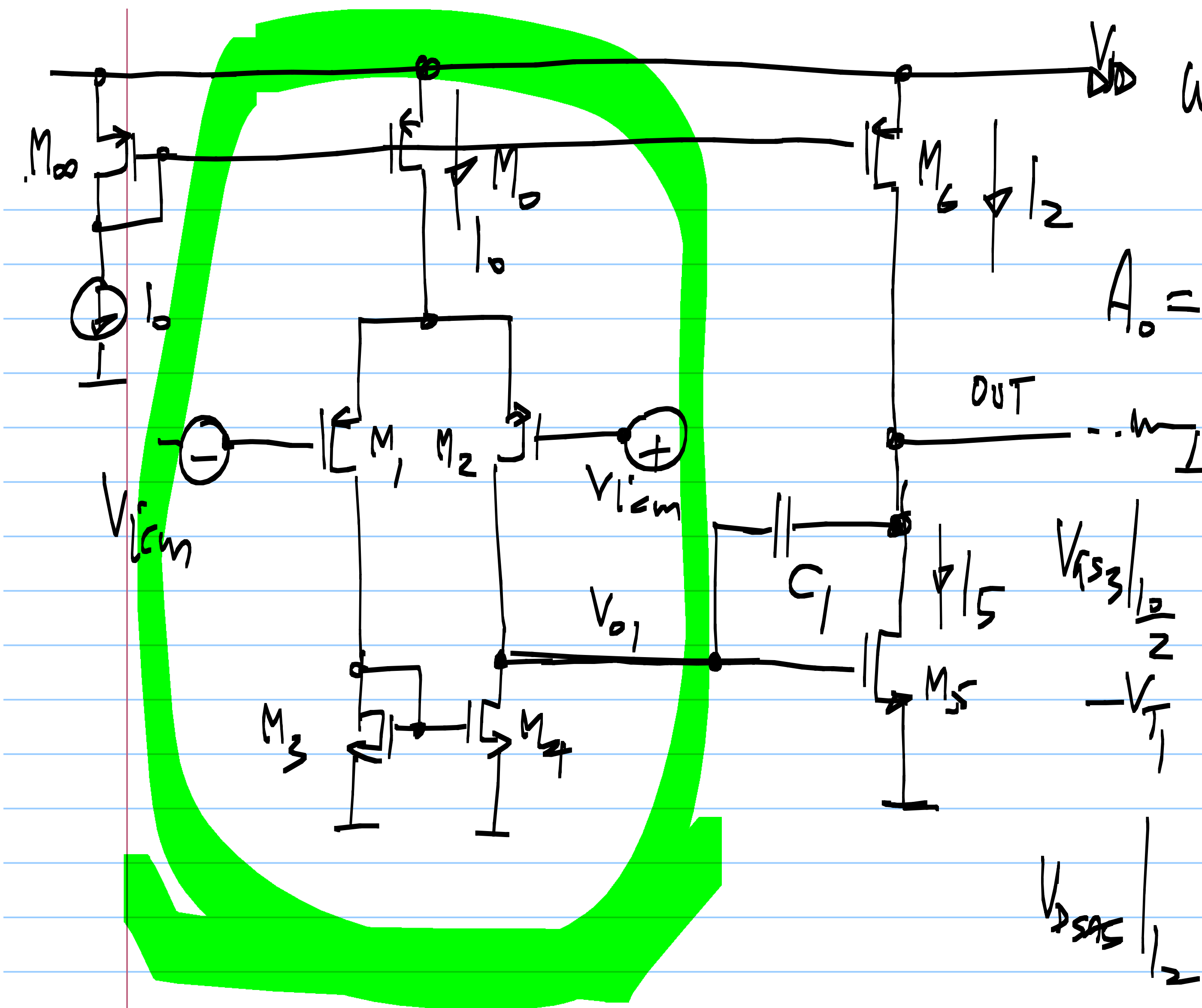


$$\frac{G_{m_2}}{C_2} > \frac{G_{m_1}}{C_1}$$

$$g_{m_1} = \sqrt{I_0 \cdot \mu_p C_{ox} \frac{W_1}{L_1}}$$

$$G_{m_2} = g_{m_5} = \sqrt{2 \cdot \mu_n C_{ox} \frac{W_5}{L_5} \cdot I_2}$$

Two stage opamp. $\omega_u = \frac{g_{m_1}}{C_1}$

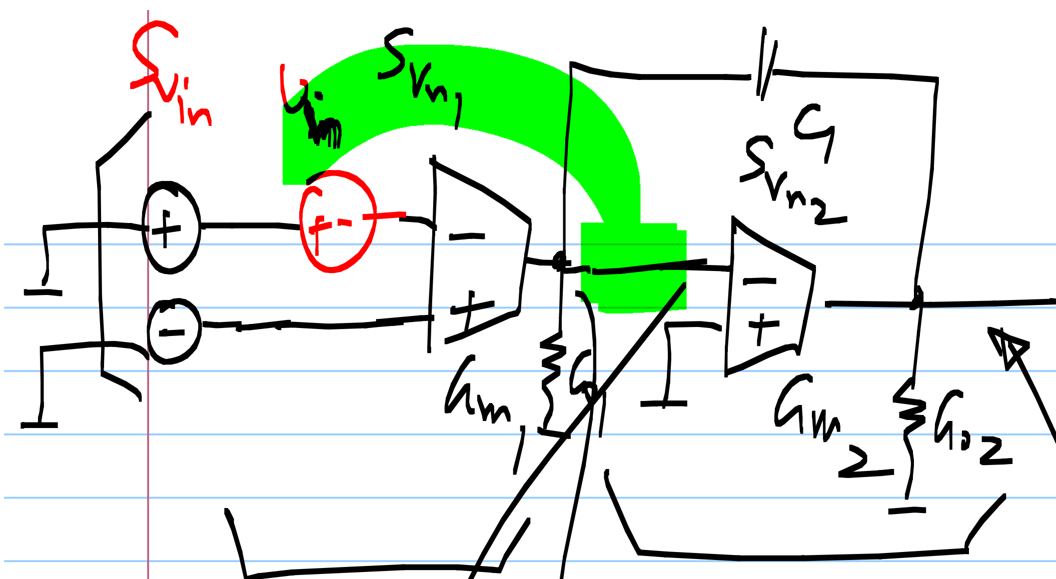


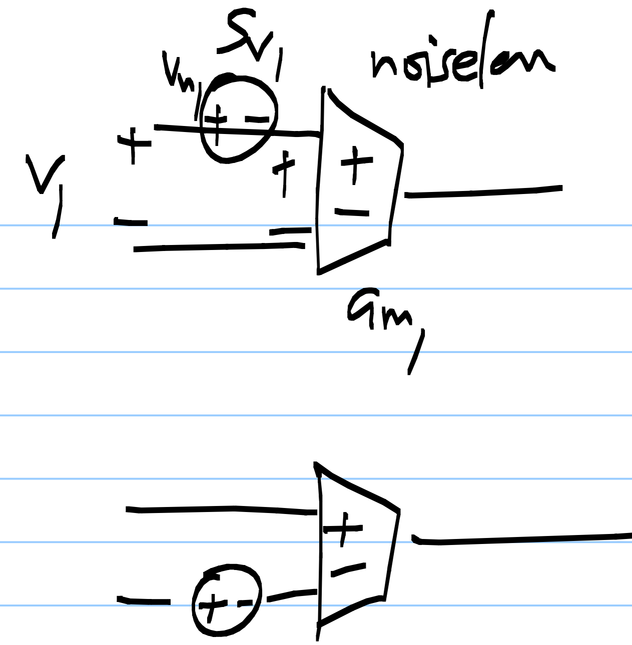
$$\omega_u = \frac{g_{m1}}{C_1}$$

$$A_0 = \frac{g_{m1}}{g_{ds1} + g_{ds3}} \cdot \frac{g_{m5}}{g_{ds5} + g_{ds6} + G_L}$$

$$V_{GS3}\Big|_{\frac{I_0}{2}} - V_{T1} \le V_{icm} \le V_{DD} - \left(V_{DSAT0}\Big|_{I_0} + V_{DSAT1}\Big|_{\frac{I_0}{2}} + V_{T1}\right)$$

$$V_{DSAT5}\Big|_{I_2} \le V_o \le V_{DD} - V_{DSAT6}\Big|_{I_2}$$





$$S_{v_{in}} = S_{v_{n_1}} + \frac{S_{v_{n_2}}}{(G_{m_1}/G_{o_1})^2}$$

$$\left(v_{n_1} \cdot \frac{G_{m_1}}{G_{o_1}} - v_{n_2}\right)^2 \left(-\frac{G_{m_2}}{G_{o_2}}\right)$$

$$S_{v_{on}} = S_{v_{n_1}}\left(\frac{G_{m_1}}{G_{o_1}} \cdot \frac{G_{m_2}}{G_{o_2}}\right) + S_{v_{n_2}} \cdot \left(\frac{G_{m_2}}{G_{o_2}}\right)^2$$