

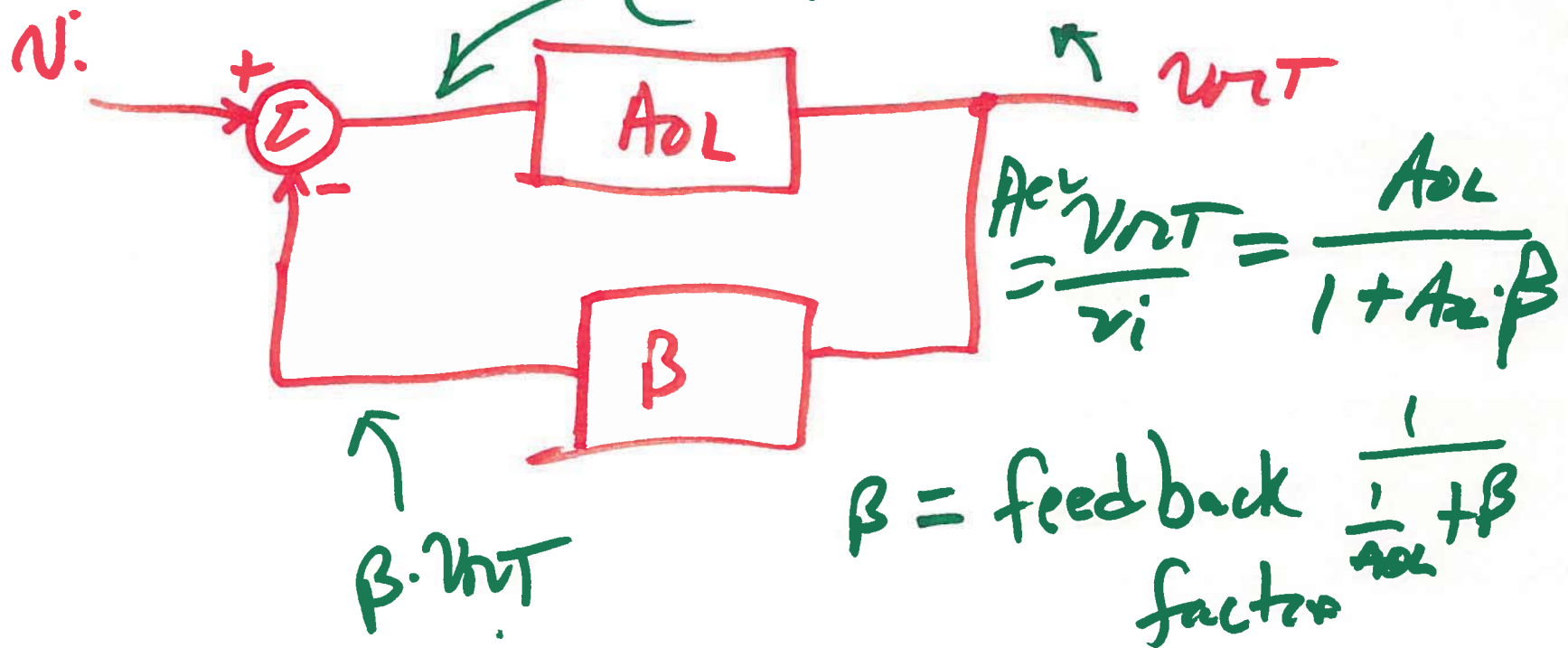
EE 420 / ECG 620

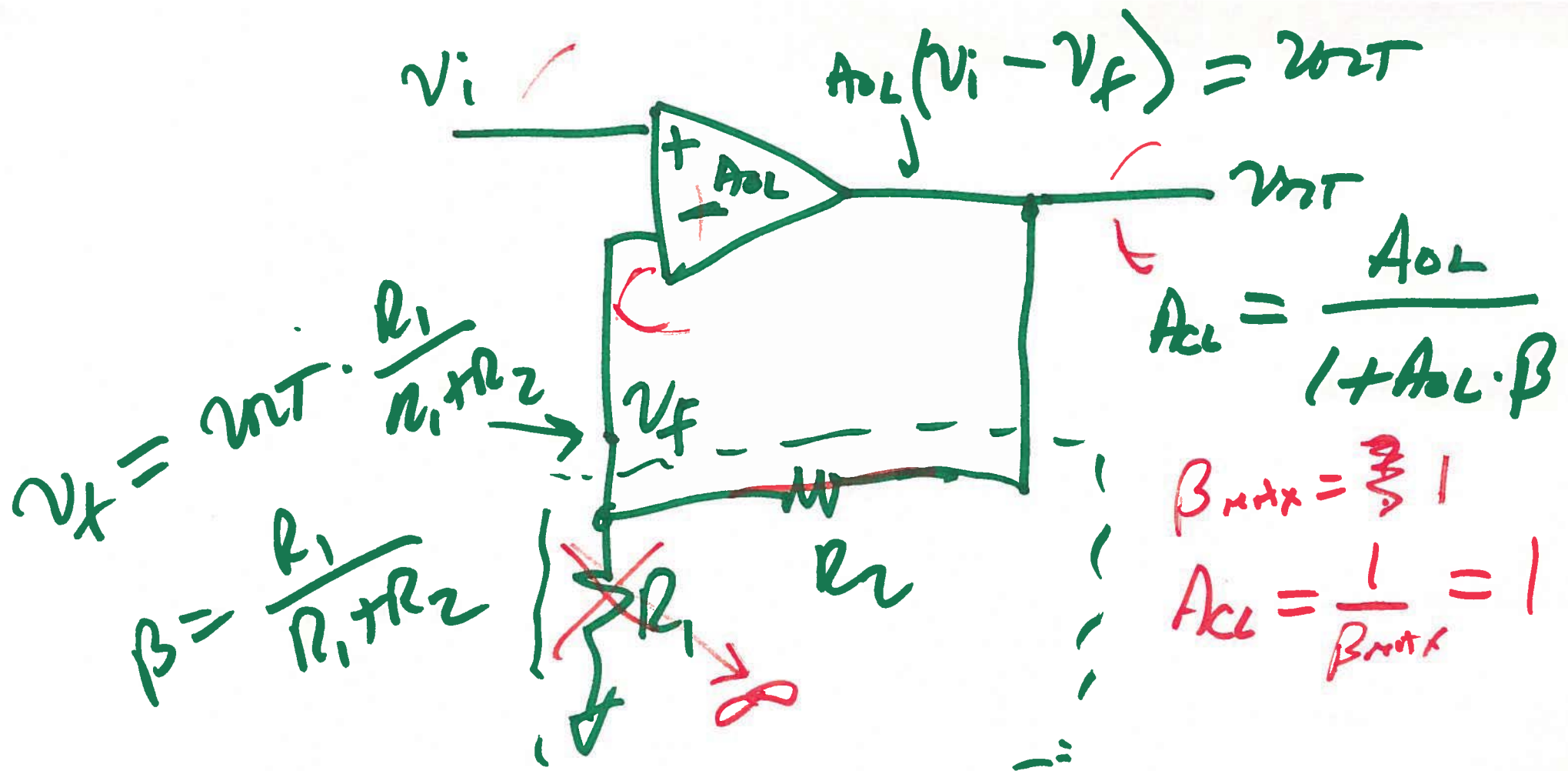
April 19, 2016

$$A_{OL} V_i = (1 + A_{OL} \beta) v_{NT}$$

Lecture 24

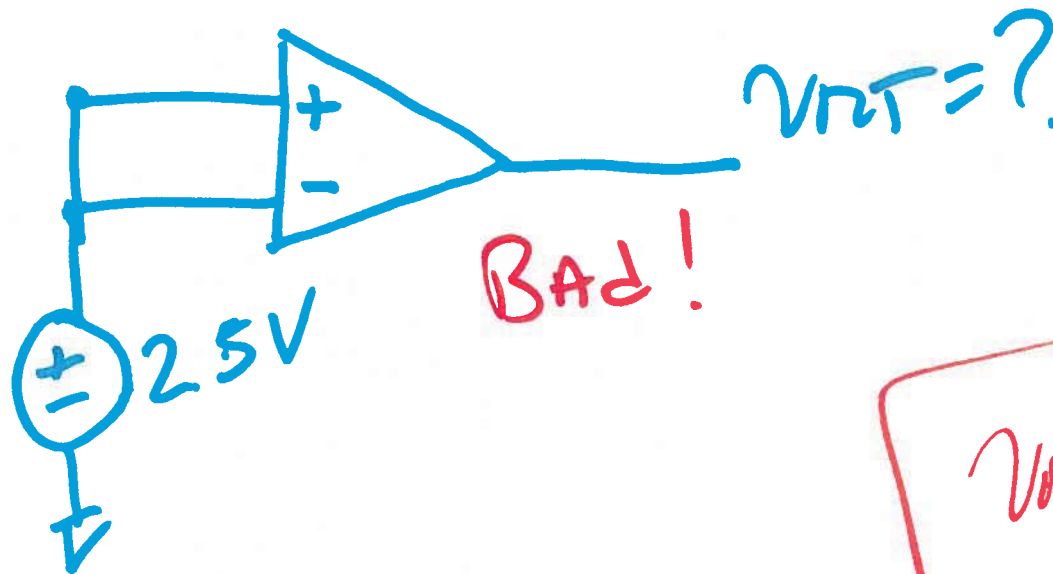
$$(v_i - \beta v_{NT}) A_{OL} = v_{NT}$$



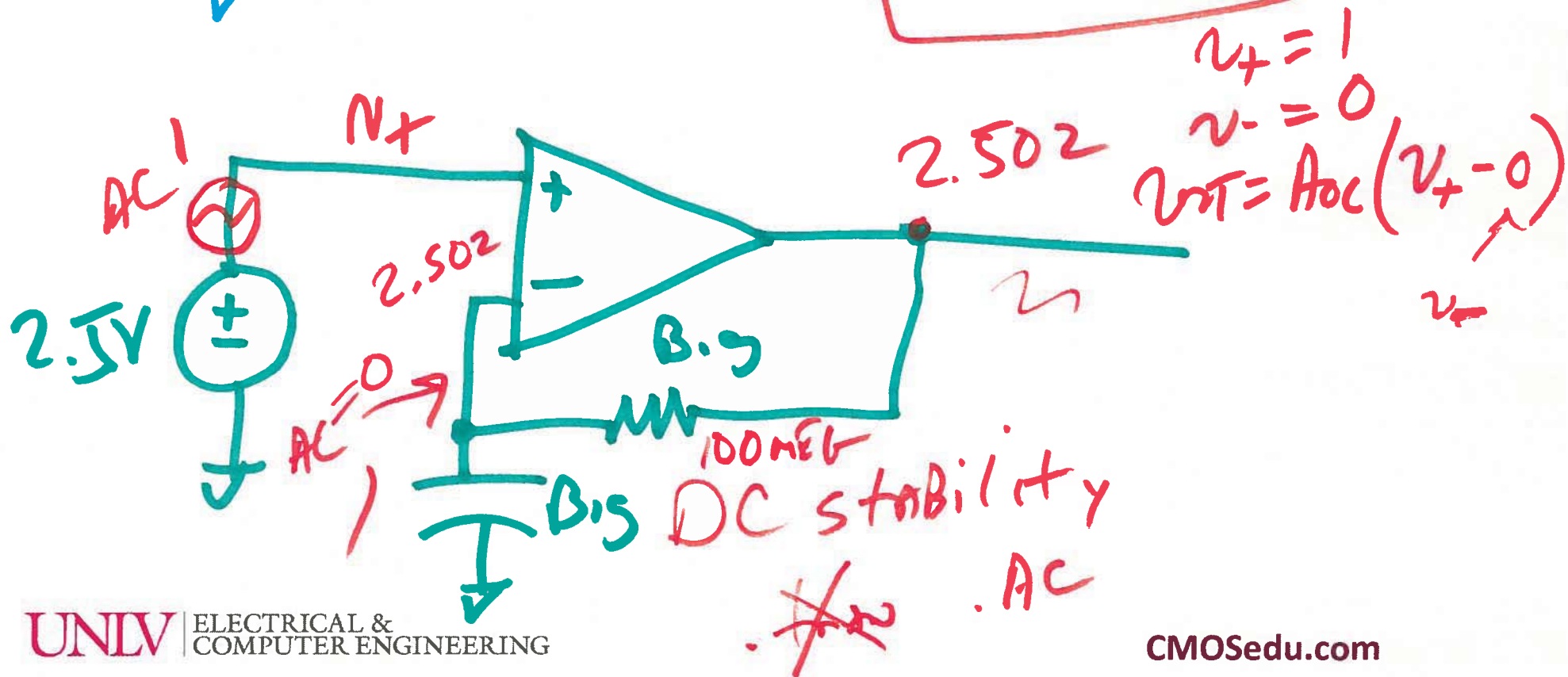


$$A_{CL}|_{ideal} = \frac{v_{out}}{v_i} = \frac{1}{\beta} = \frac{R_1 + R_2}{R_1} = 1 + \frac{R_2}{R_1} = 1$$

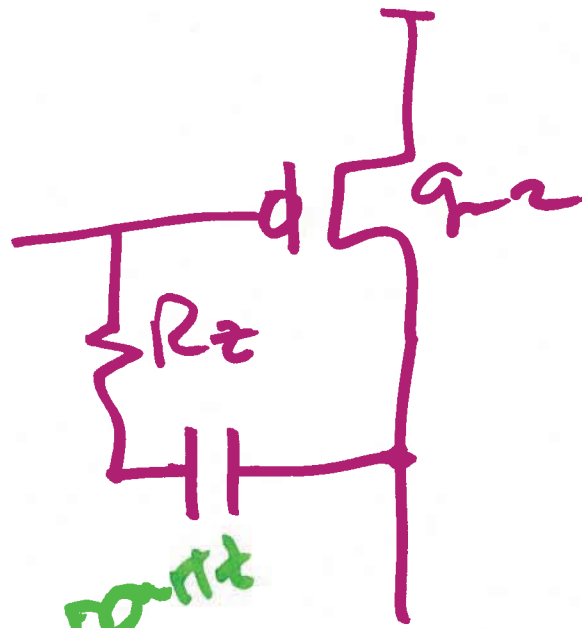
$A_{OL} \rightarrow \infty$
 $A_{OL} \cdot \beta = -1 \Rightarrow |A_{OL} \beta| = 1$
 $\angle A_{OL} \beta = \pm 180^\circ$



$$V_{out} = A_{OL}$$



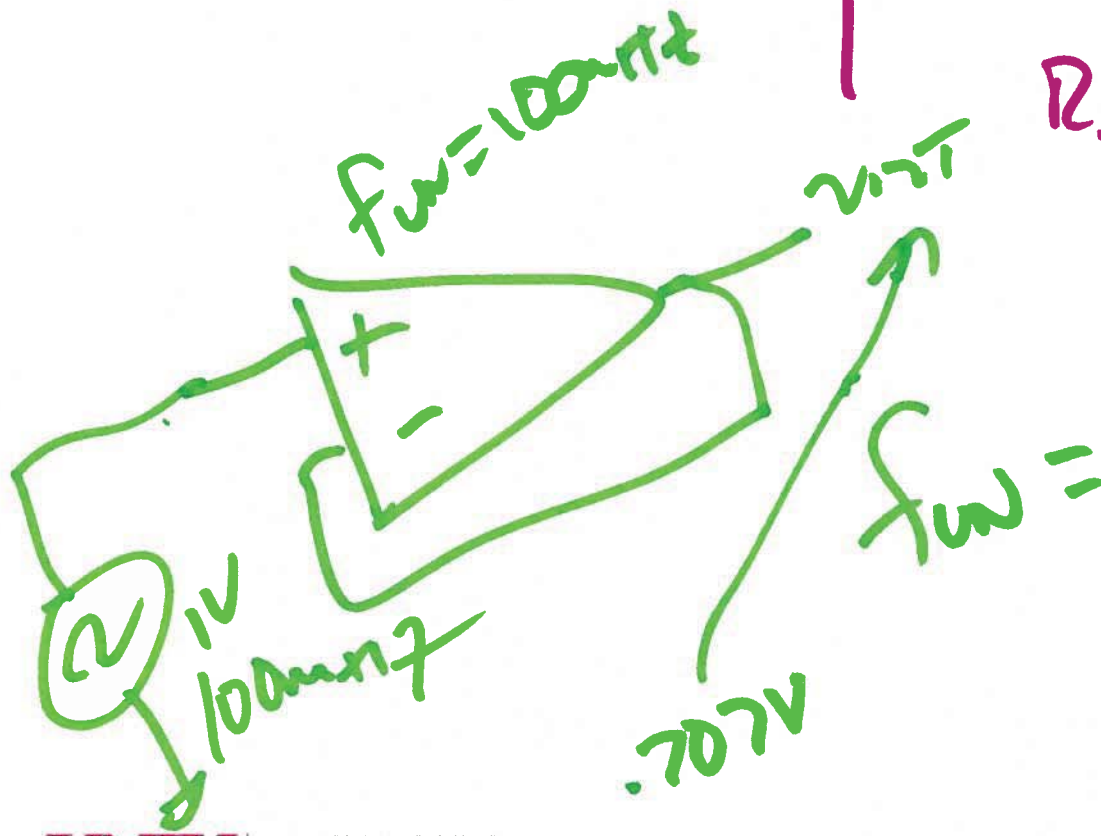
21.73



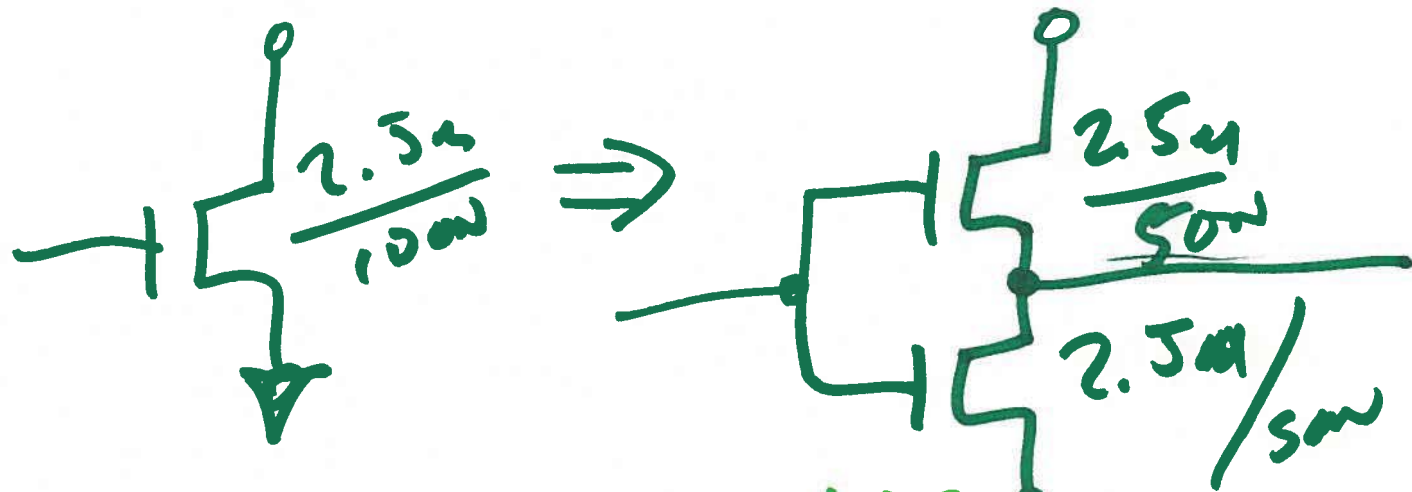
$$f_z = \frac{1}{2\pi C_c \left(\frac{1}{g_{m2}} + R_z \right)}$$

$$R_z = \frac{1}{g_{m2}} \quad f_z \rightarrow \infty$$

diff. pair



$$f_{in} = \frac{g_m}{2\pi C_c}$$



$$V_{OUTMAX} = 5 - 0.25 - 1.05$$

$$V_{DD} - V_{SD,SAT} - V_{GS} = 3.7V$$

$$V_{OUTMIN} =$$

$$V_{DS,SAT} + V_{SV} = 1.4V$$

$0.25 \qquad 1.15$

