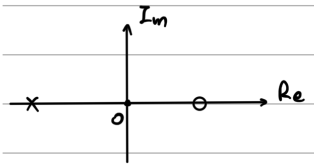
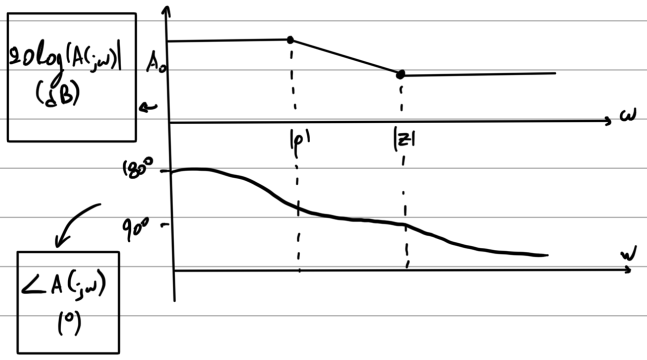
$$A(s) = \frac{u_{out}}{u_{in}} = -\frac{g_m - sC_{gdN}}{g_t + sC_t'} = -\frac{g_m}{g_t}\cdot\frac{1 - s\frac{C_{gdN}}{g_m}}{1 + s\frac{C_t'}{g_t}} \qquad s = j\omega \qquad p = -\frac{g_t}{C_t'} \qquad z = \frac{g_m}{C_{gdN}}$$

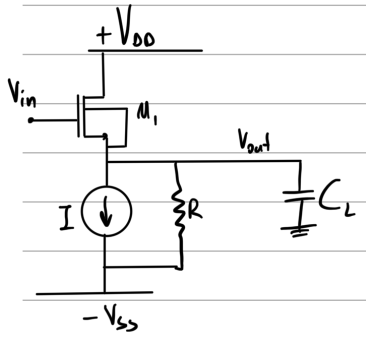
$$A(s) = A_0\,\frac{1 - s/z}{1 - s/p}$$



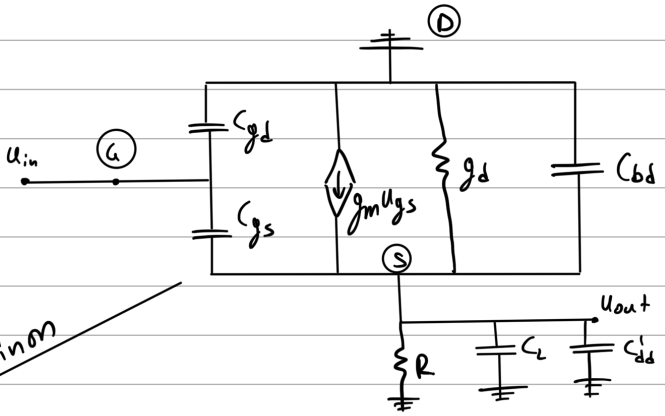
επίπεδο →



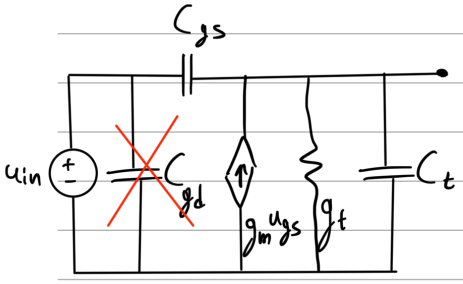
Ακόλουθος πηγής



ΙΚΑΣ →

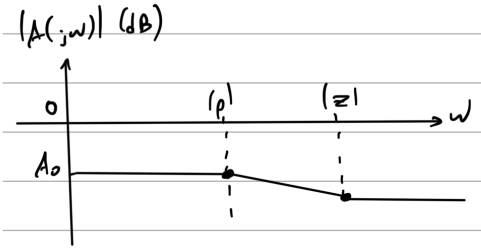


απλοποίηση

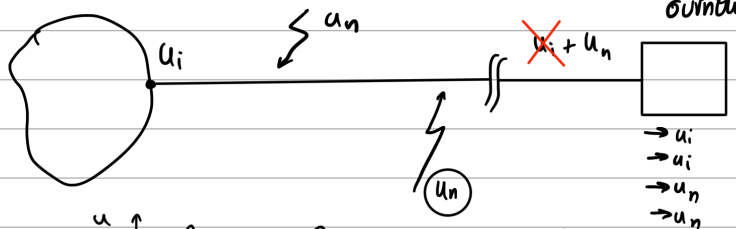


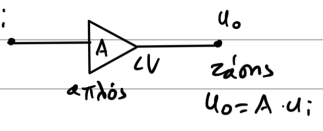
- $g_t = g_d + \frac{1}{R}$
- $C_t = C_{bd} + C_L + C_{dd}'$
- $A(s) = A_0 \cdot \frac{1 - s/z}{1 - s/p}$
- $p = -\frac{g_m}{C_{gs} + C_t}\cdot\left(1 + \frac{g_t}{g_m}\right)$

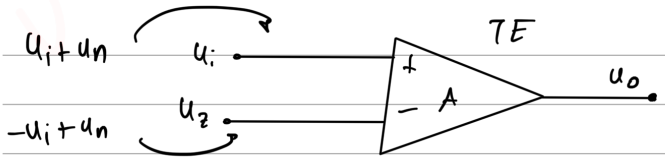
- $A_0 = \frac{g_m}{g_m + g_t} \simeq 1$
- $p \simeq -\frac{g_m}{C_{gs} + C_t}$
- $z = -\frac{g_m}{C_{gs}}$



συνήθως $u_n \gg u_i$



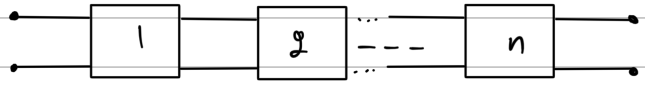




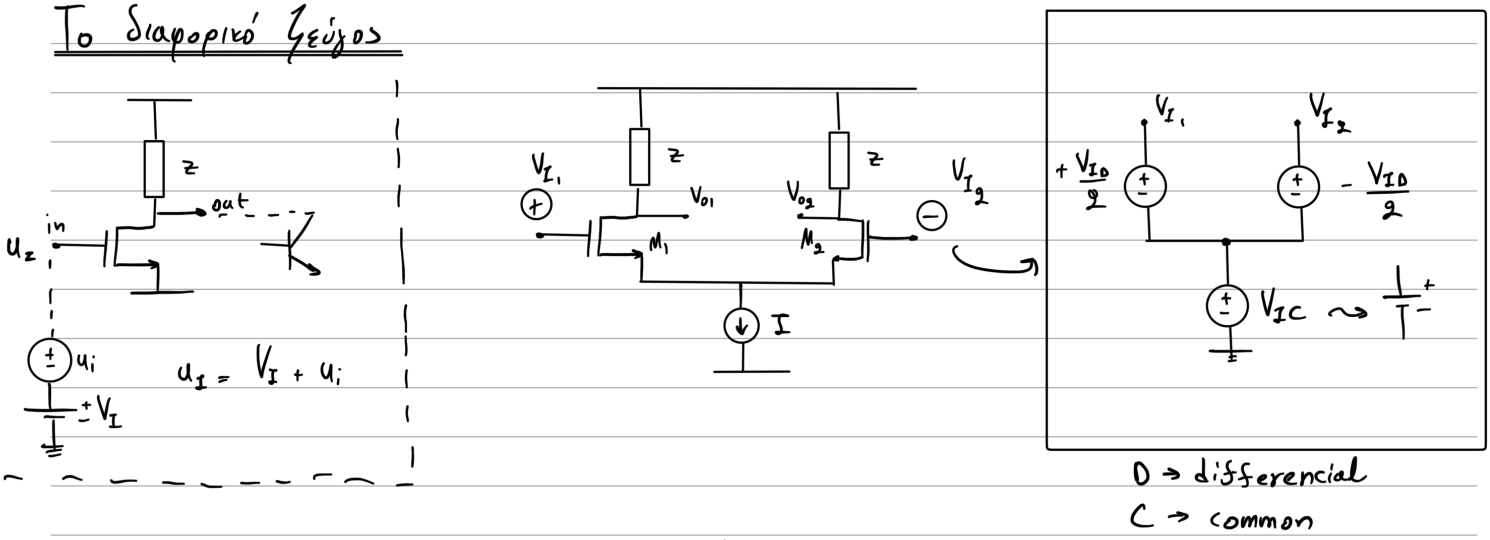
ΤΕ

$u_o = A(u_1 - u_2) =$

$= A(u_i + u_2 - (-u_i + u_2) = 2Au_i$

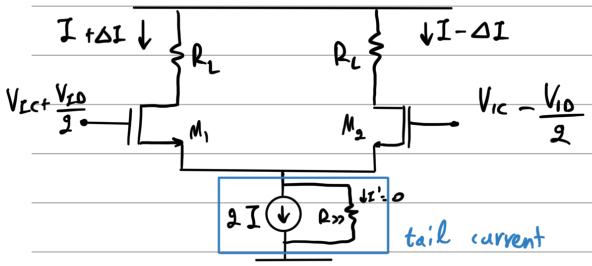


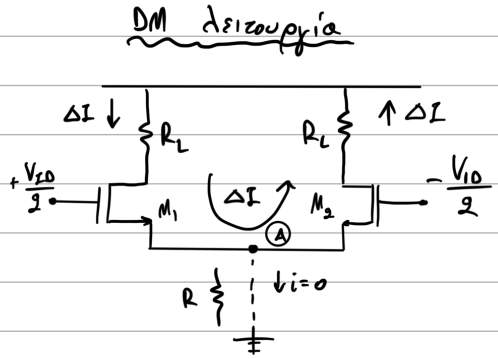
Το διαφορικό ζεύγος



- $u_{I_1} = \frac{u_{ID}}{2} + V_{IC}$
- $u_{I_2} = -\frac{u_{ID}}{2} + V_{IC}$
- $V_{OD} = V_{O1} - V_{O2}$
- $V_{OC} = \frac{V_{O1} + V_{O2}}{2}$

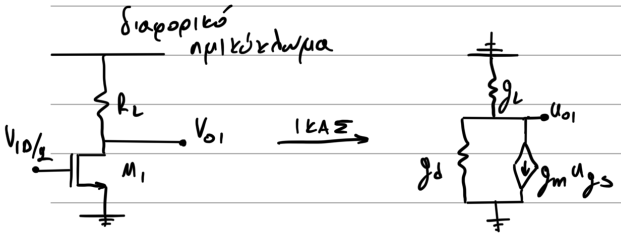
Διαφορική λειτουργία (Differencial Mode - DM) διαφ. ζεύγους





$u_A = 0$

ο κόμβος Α βρίσκεται σε ac ground (ή virtual ground)



- $u_{o1} = -g_m u_{gs} \cdot \frac{1}{g_L} = -\frac{g_m}{g_L}\frac{u_{id}}{2}$
- $u_{o2} = \frac{g_m}{g_L}\frac{u_{id}}{2}$
- $u_{od} = u_{o1} - u_{o2} = -\frac{g_m}{g_L} u_{id}$
- $A_{DM} \equiv \frac{u_{od}}{u_{id}} = -\frac{g_m}{g_L}$