

P.6
EE302
10/17/00

$$I_{Dn} = \frac{\mu P_n}{2} \frac{W_n}{L_n} (V_{GS} - V_{thn})^2$$

$\begin{matrix} \text{"} \\ 0.8 \times 10^{-5} \end{matrix}$
 $\begin{matrix} \text{"} \\ V_0 = 2 \end{matrix}$
 $\begin{matrix} \text{"} \\ 1/2 \end{matrix}$

if assume $W_n = L_n = 10 \mu$

$$\begin{aligned}
 I_{Dn} &= \frac{0.8 \times 10^{-5}}{2} \left(\frac{3}{2} \right)^2 = 10 \times 10^{-6} \text{ mA} \\
 &= \frac{9 \times 0.8 \times 10^{-2}}{4 \times 2} \text{ mA} \\
 &= \text{0.9} \times 10^{-2} \text{ mA} \\
 &= 9 \times 10^{-3} \times 10^{-3} \text{ A} \\
 &= 9 \text{ nA}
 \end{aligned}$$

Power into the divider:

$$P = V \cdot I = V_{dd} \cdot I_{Dn}$$

$$= 5 \times 9 \times 10^{-6} \text{ W}$$

$$= 45 \mu \text{ watt}$$