Loss Estimation

$V_o = 0.8V$, $V_{in} = 1.8V$

$I_{load} = 1A$, $\eta = 90\% = 0.9$

$$\eta = \frac{P_{out}}{P_{in}} = \frac{P_{out}}{P_{out} + P_{loss}}$$

$$\Rightarrow P_{loss} = \left(\frac{1}{\eta} - 1\right) P_{out}$$

$\eta = 0.9$

$P_{loss} = 0.11 \times P_{out}$ $\quad P_{out} = 0.8 \times 1A = 0.8W$

$\simeq 88mW$

$88mW = P_{cond\_loss} + P_{sw\_loss}$

$F_{sw} = 10MHz$

CV^2f

$C = 100pf$

$10^{-10} \times (0.8)^2 \times 10^7 = 10^{-3} \times$

$P_{sw\_loss} = 7mW$

P_{cond_loss}

$t_{cond} = 1ns$

$$2 \times \frac{0.7 \times 1 \times 1ns}{100ns} \simeq 7mW \times 2 = 14mW$$

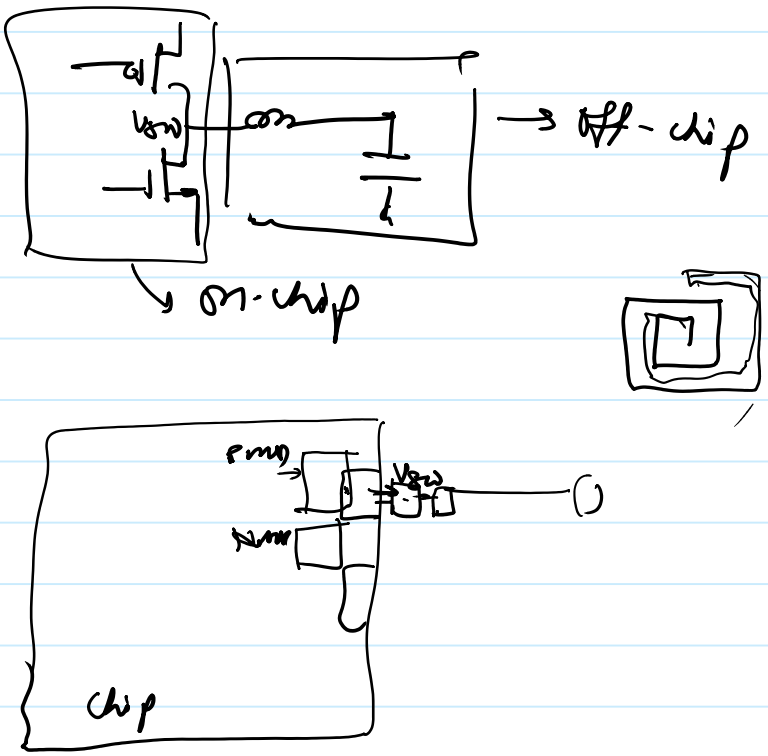
$0.8V \rightarrow V_0$

$0.6 \rightarrow V_{ref}$

$$\beta = \frac{V_{ref}}{V_0} = \frac{0.6}{0.8} = 0.75$$

$V_0 = 1.5V$

$$\beta = \frac{0.6}{1.5} = 0.4$$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