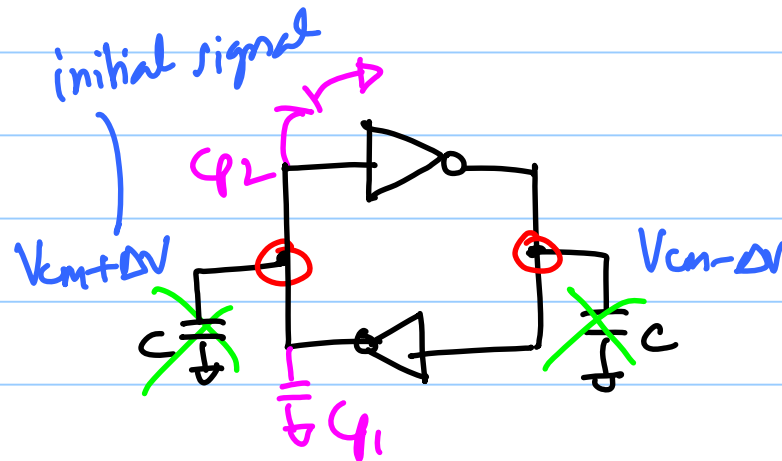


ECE 614 - Lecture 22

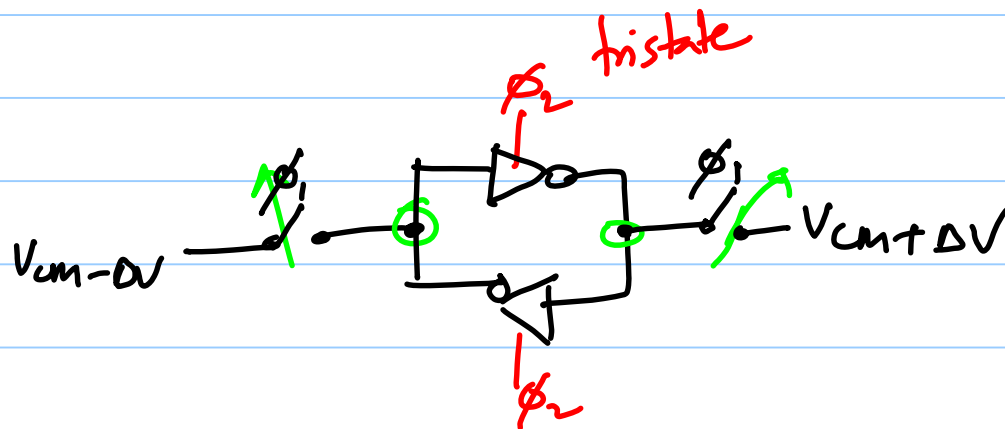
Note Title

11/6/2014



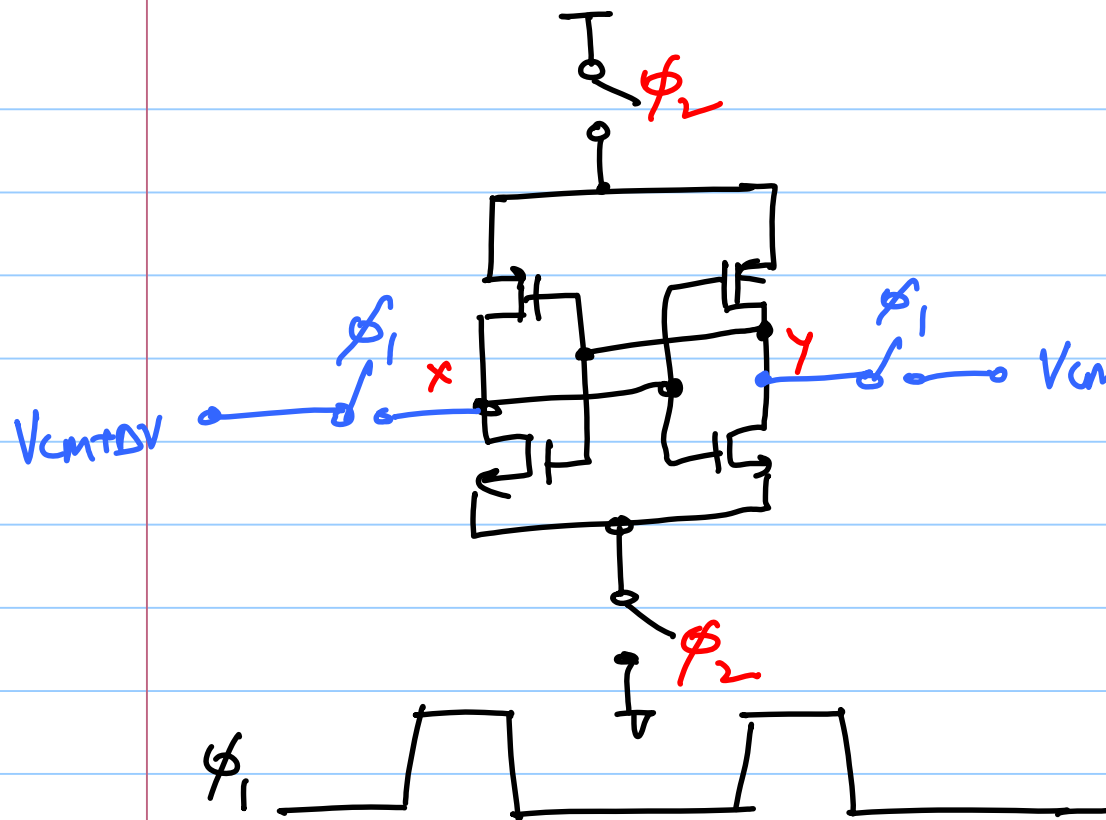
$$\tau = \frac{C}{G}$$

$$= \frac{\cancel{C} + C_1 + C_2}{G}$$

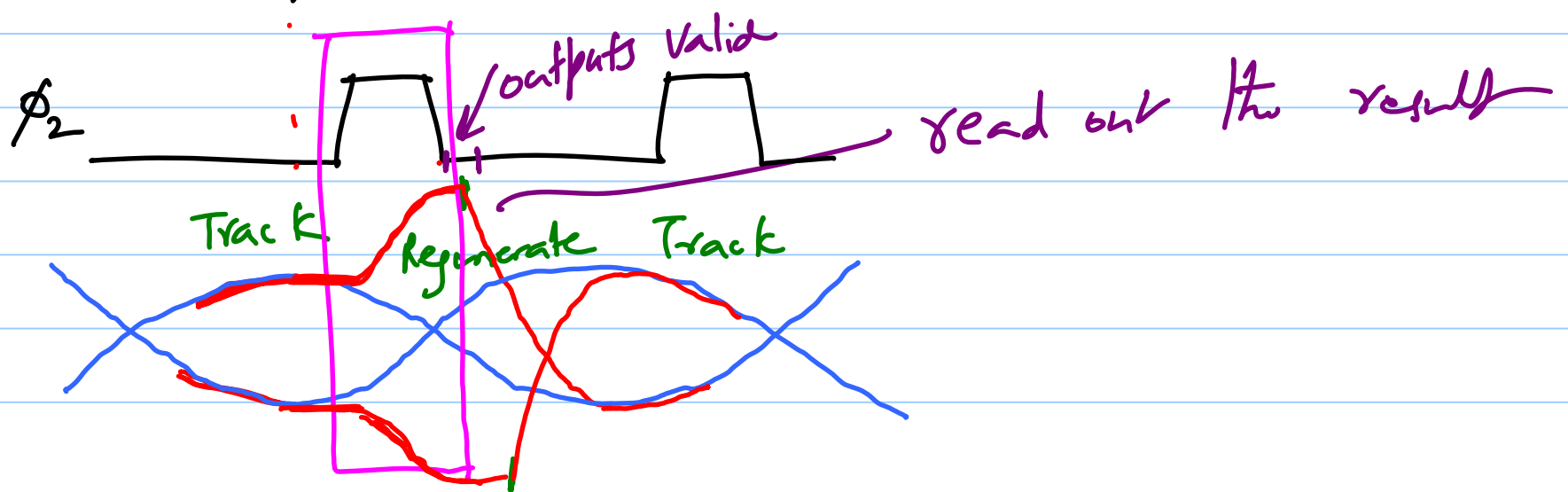


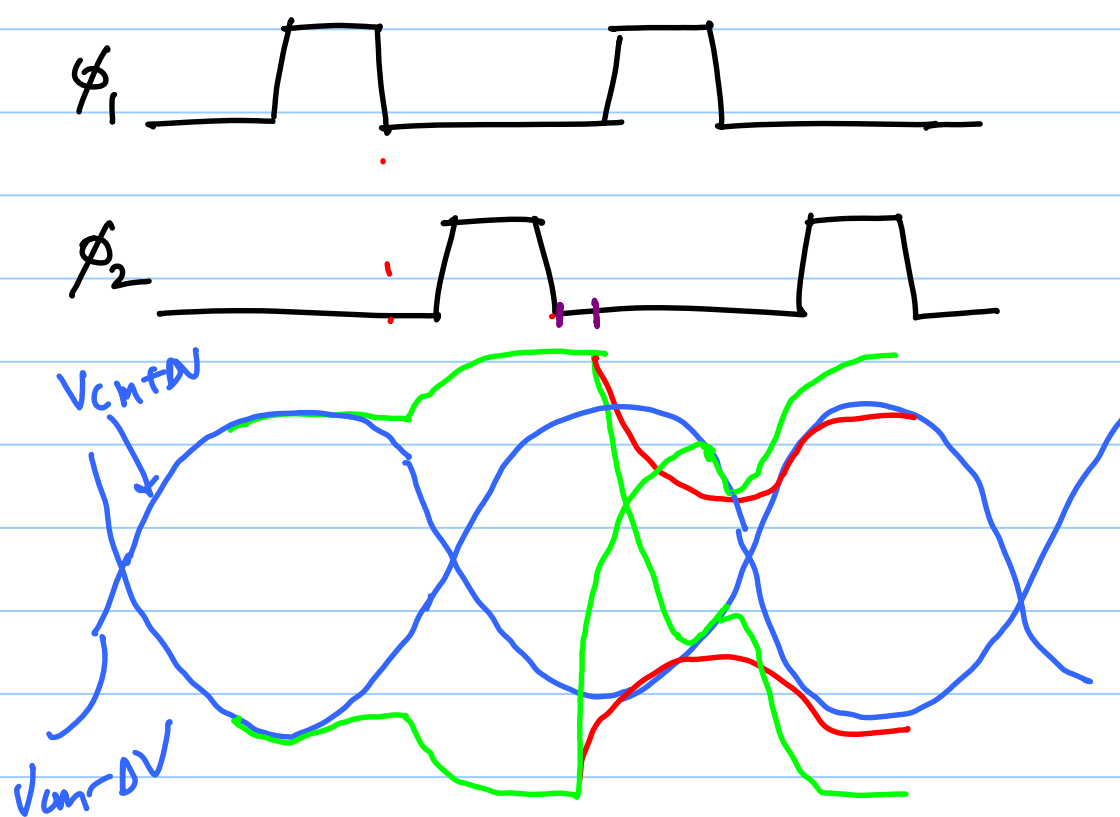
$$V_{cm} \rightarrow D_0 \rightarrow V_{cm}$$

Static power dissipation



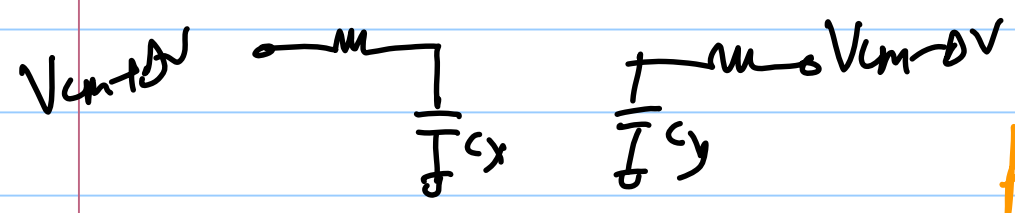
Tristate the inverter during phase $\phi_1 \Rightarrow$ no static power is consumed



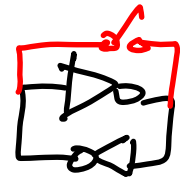


Can make error
due to finite
RC time-constant of the
tracking switch

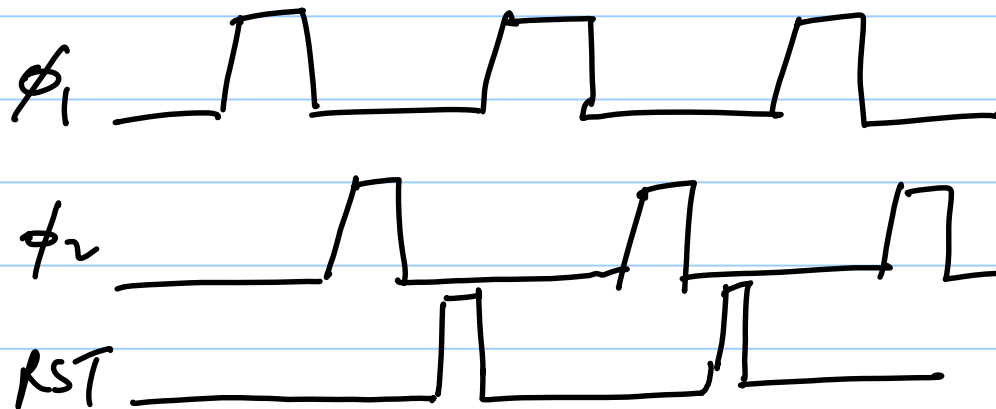
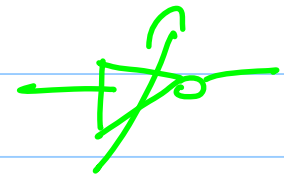
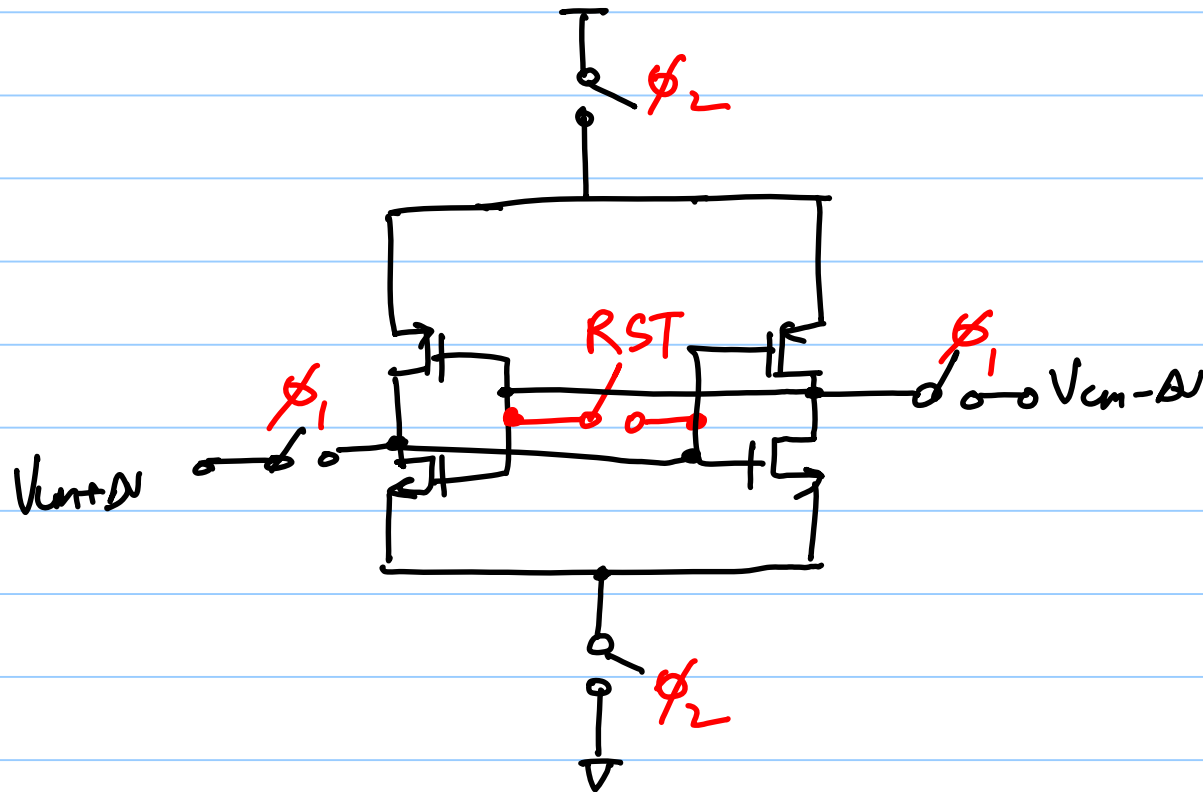
Memory dependent
↳ remembers its pasts

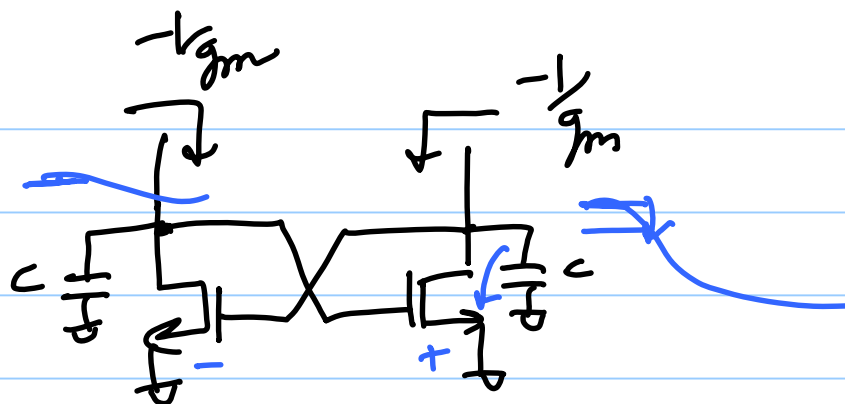
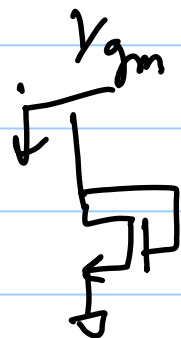


phase lag from the input
in tracking mode

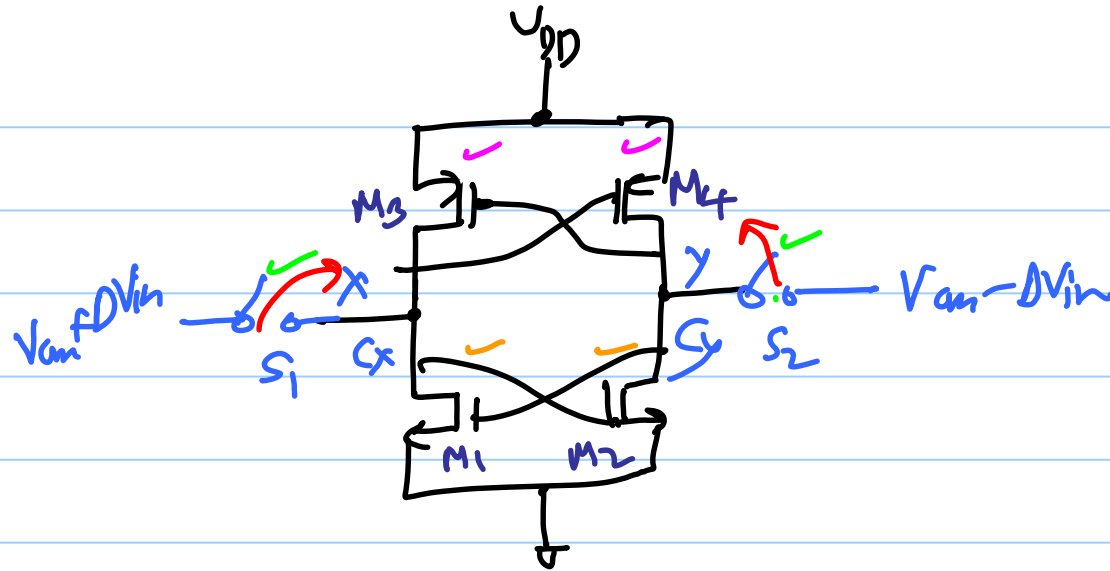


* Cross coupled Latch





$$V_{OS} = \Delta V_{THN} + \frac{1}{2} \frac{\Delta(W/L)}{(W/L)} V_{OV}$$



$$S_x = \frac{\delta x}{2}$$

$$V_{OS_{1,2}} = \Delta V_{THN_{1,2}} + \frac{1}{2} \frac{\Delta(W/L)}{(W/L)} (V_{AS_{1,2}} - V_{THN_{1,2}})$$

$V_{OS_{3,4}}$

$V_{OS_{CI}} = \frac{\Delta Q}{C_x} \leftarrow \text{mismatch in C.I. b/w } S_1 \& S_2$

$$\sigma_{V_{os}} = \sqrt{\sigma_{V_{os,1,2}}^2 + \sigma_{V_{os,3,4}}^2 + \left(\frac{\Delta Q}{C_x}\right)^2}$$

$$\approx \underline{\underline{90 \text{ mV}}}$$

Huge offset!

0.5 μm Data

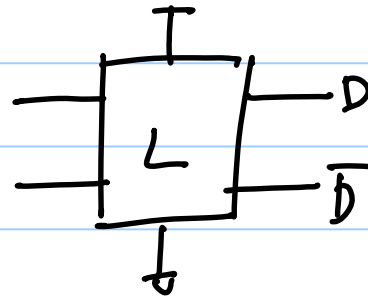
$$\sigma_{V_{THN}}^2 = 5 \text{ mV}$$

$$\sigma_{\frac{\Delta W/L}{W/L}} = 0.1$$

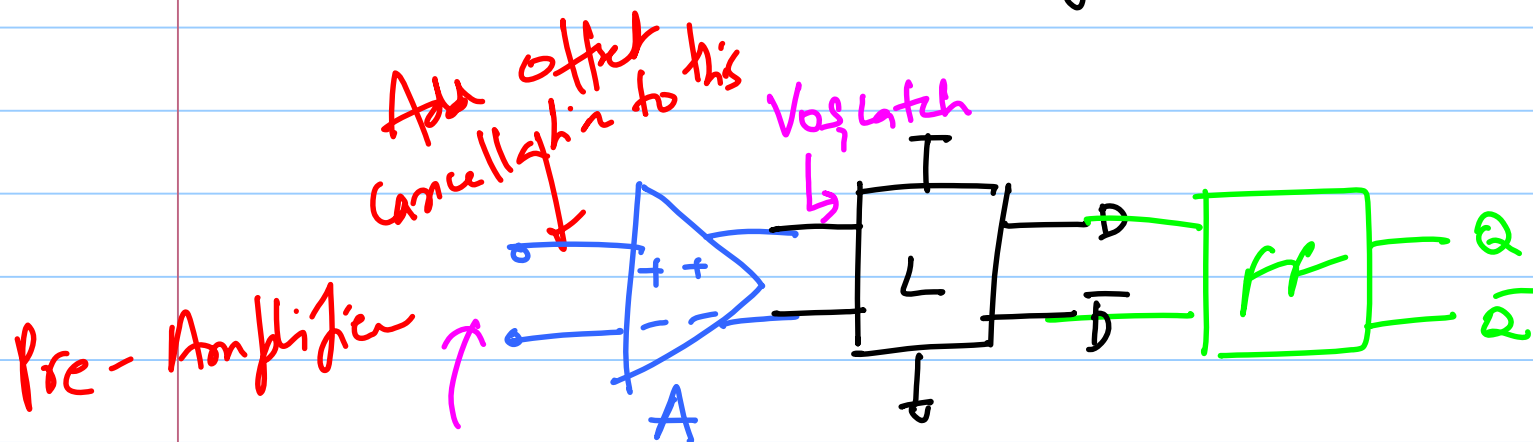
$$V_{ov} \approx 1 \text{ V}$$

$$\Delta Q = 0.8 \text{ fC}$$

$$C_x = 100 \text{ fF}$$



Can't simply
apply offset
cancellation



$A \gg 10-100$

$$V_{osin} = \frac{V_{os, latch}}{A} + \cancel{V_{os, amp}}$$

↓

↓

Cancel using offset storage method

$$V_{os, in} = \frac{V_{os, latch}}{A} + \frac{V_{os, amp}}{A}$$