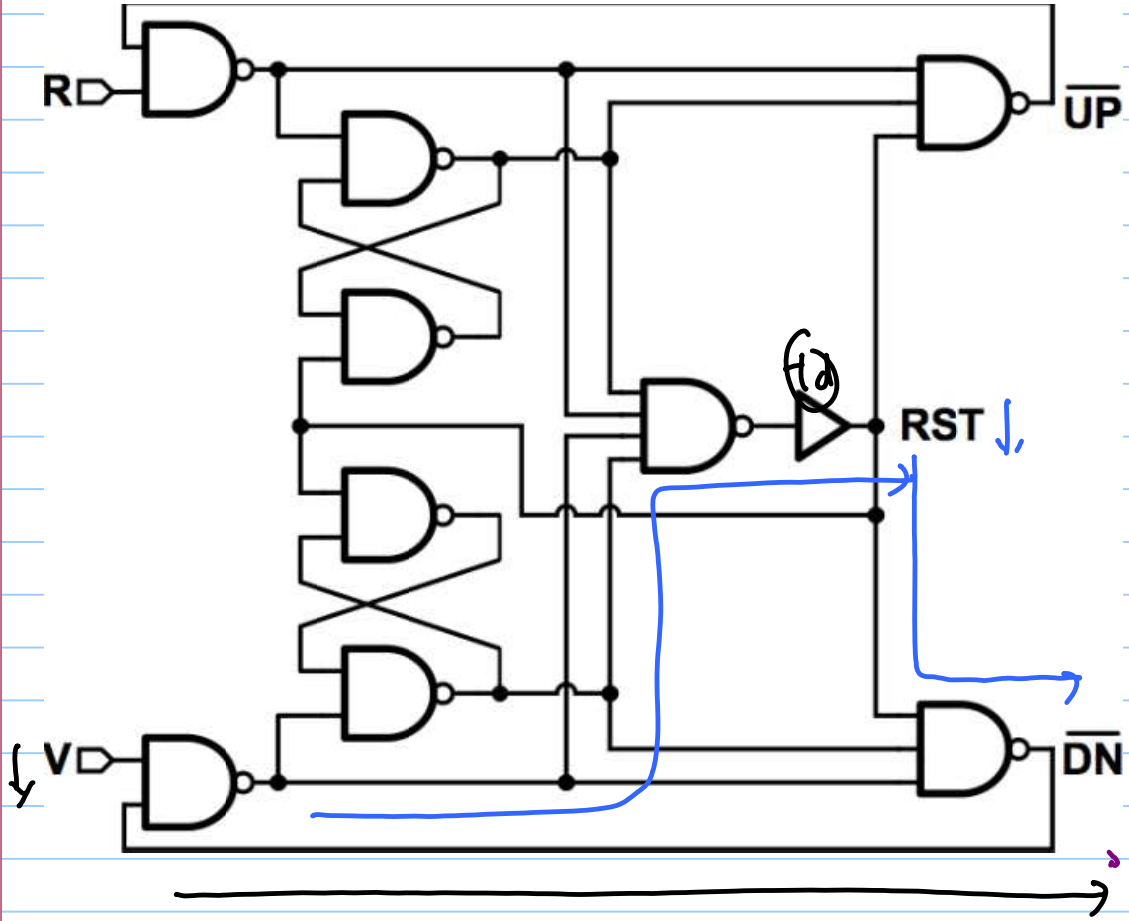
Note Title

Lecture #36

17-10-2018

Nand-based PFD



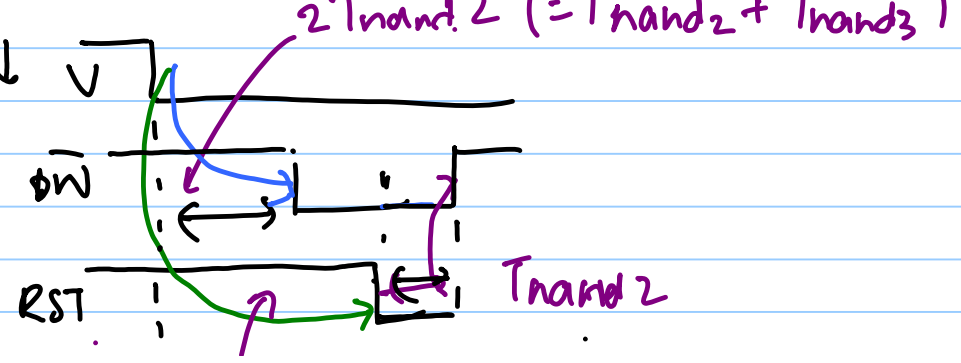
$T_{ov} = T_{nand4} + t_d$

$T_{RSi} = T_{nand4} + T_{nand2}$

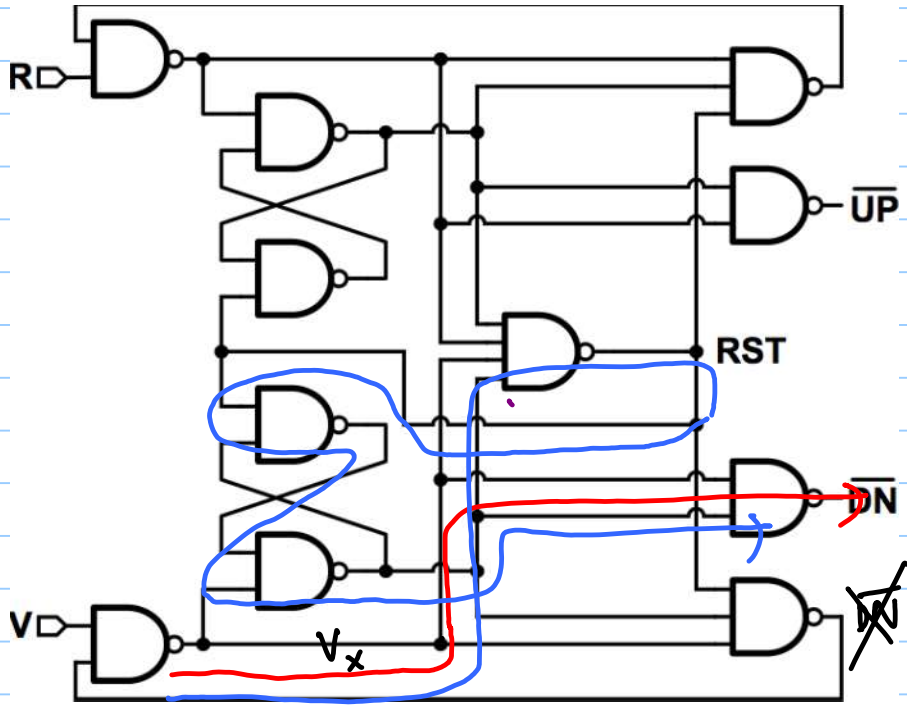
$V \rightarrow \overline{DN}$ $2T_{nand2}$

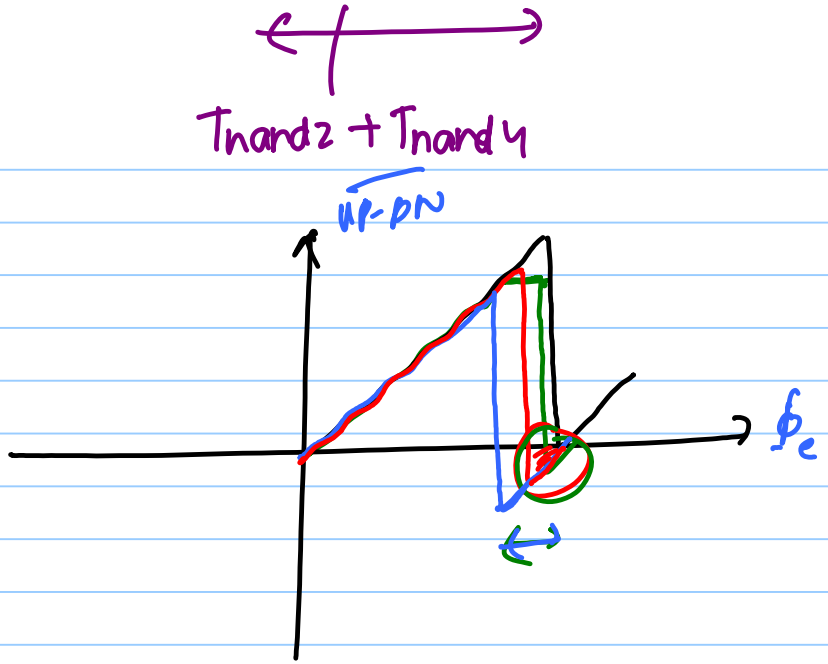
$V \rightarrow \overline{RST}$ $T_{nand2} + T_{nand4}$

$RST \rightarrow \overline{DN}$ T_{nand2}

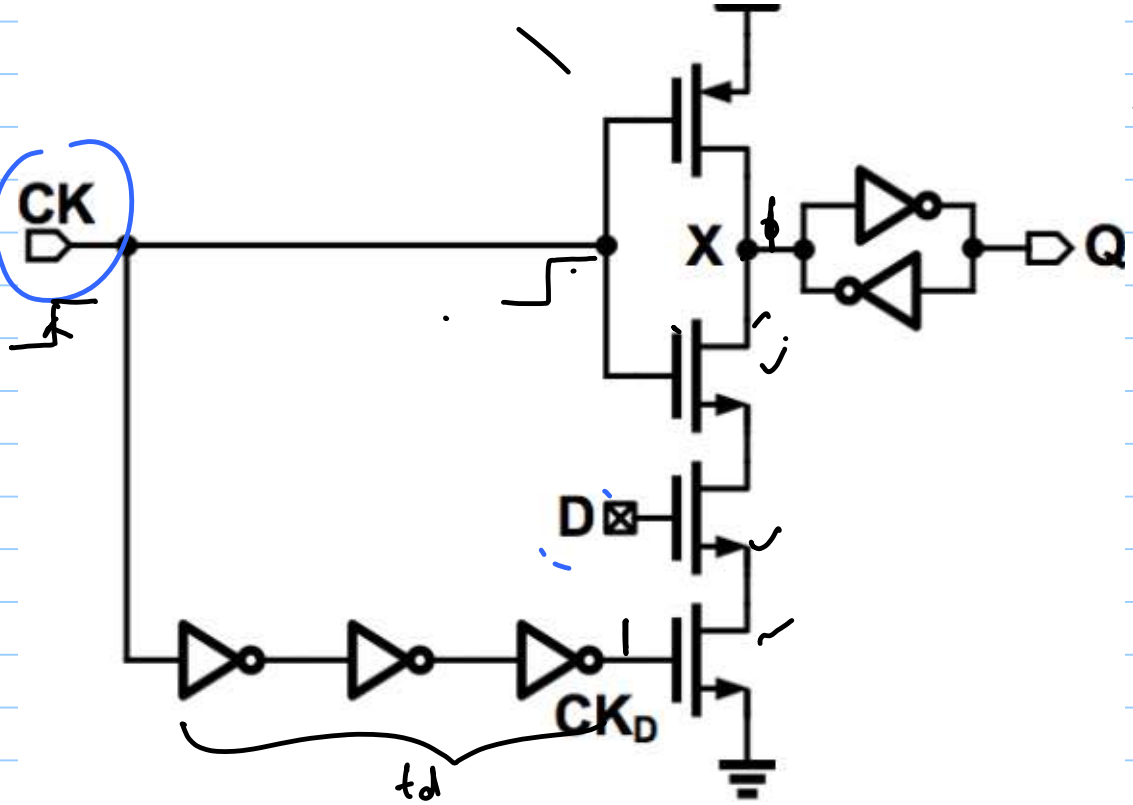


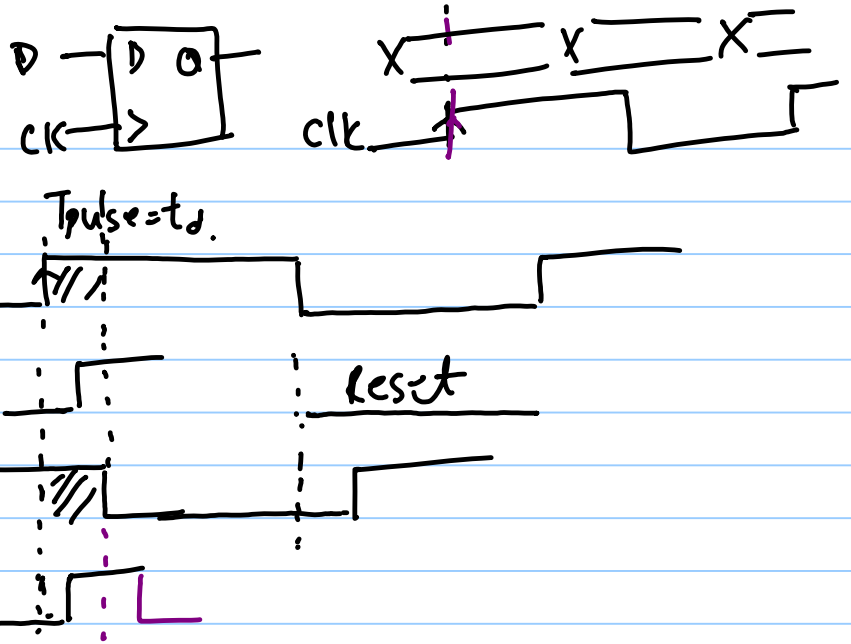
Nand-based PFD

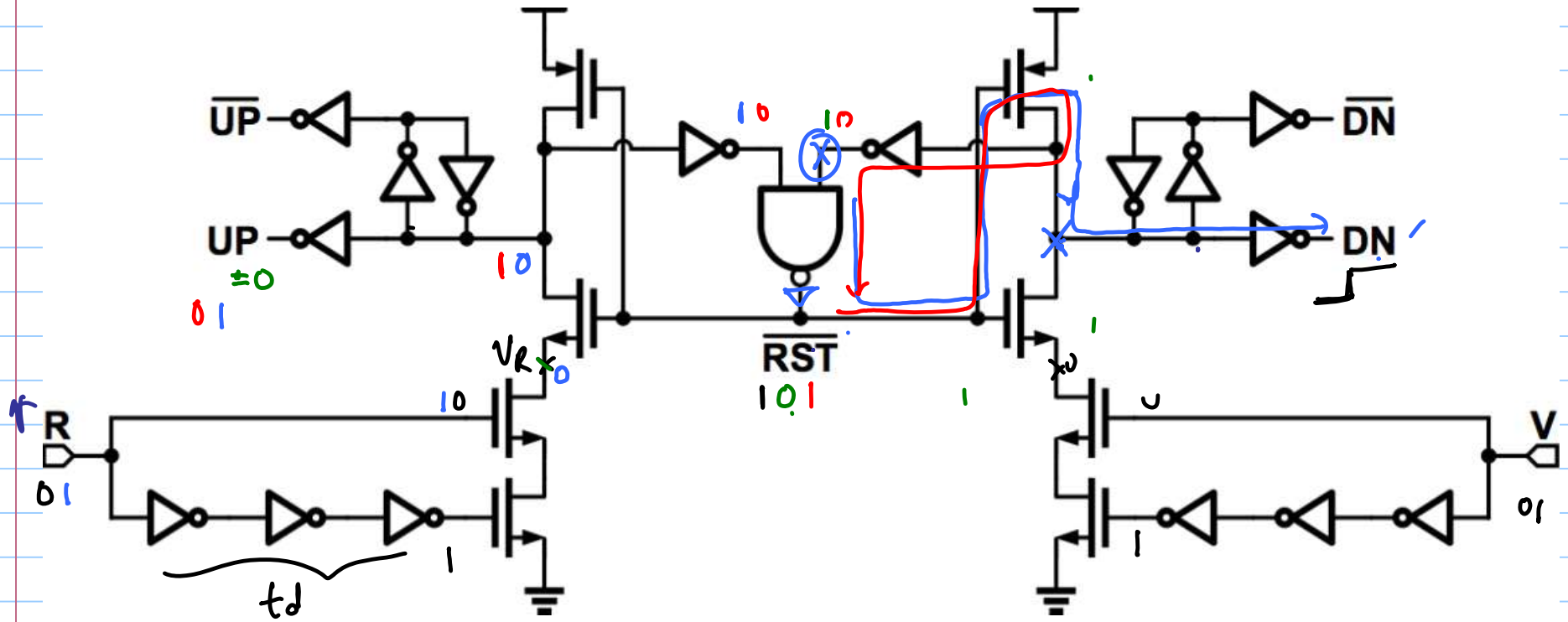


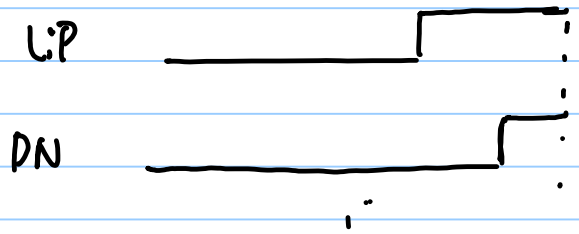


Glitch-latch based PFD



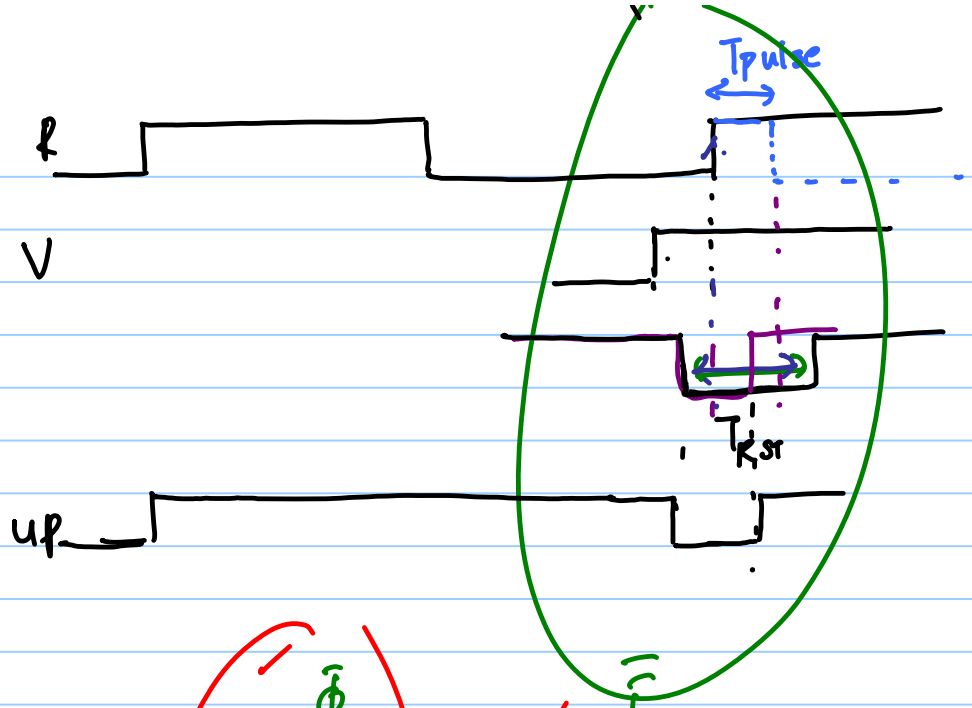


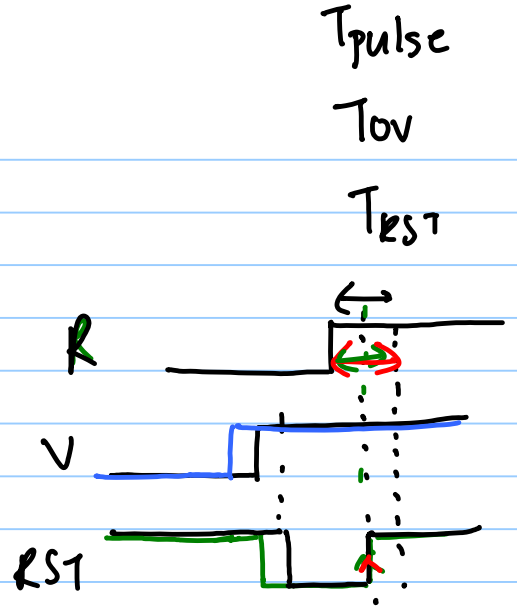


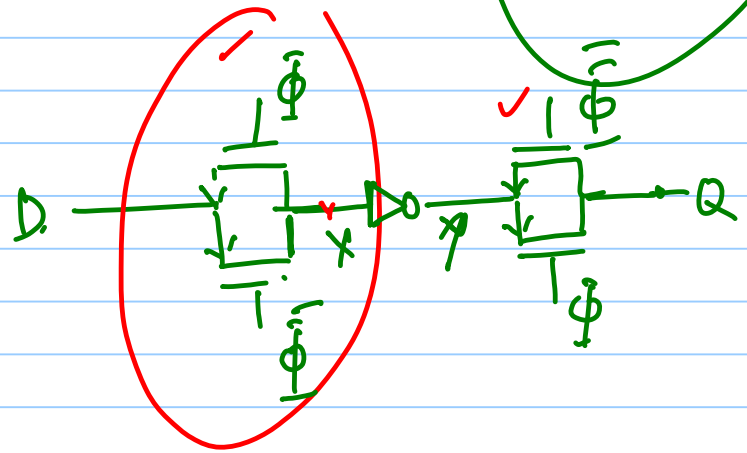


$T_{RST} = 2T_{inv} + T_{nand2}$

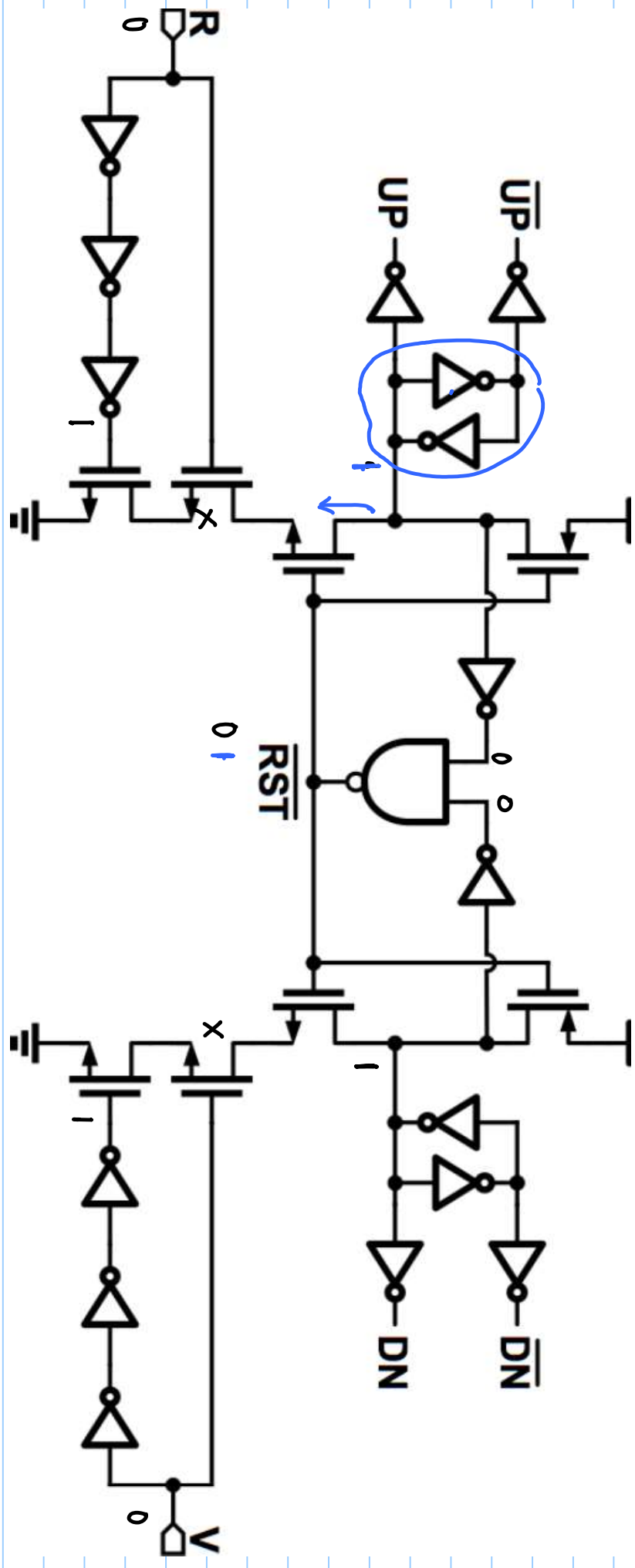
$T_{ov} = T_{nand2} + 2T_{inv}$



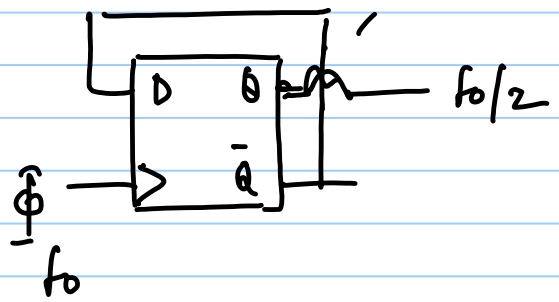




Pass-transistor based flip-flop


R
UP
UP
RST
DN
DN
V

Divider ✓



Div - 15 | Div-by- 2/3

fractional-N.

Loop-filter