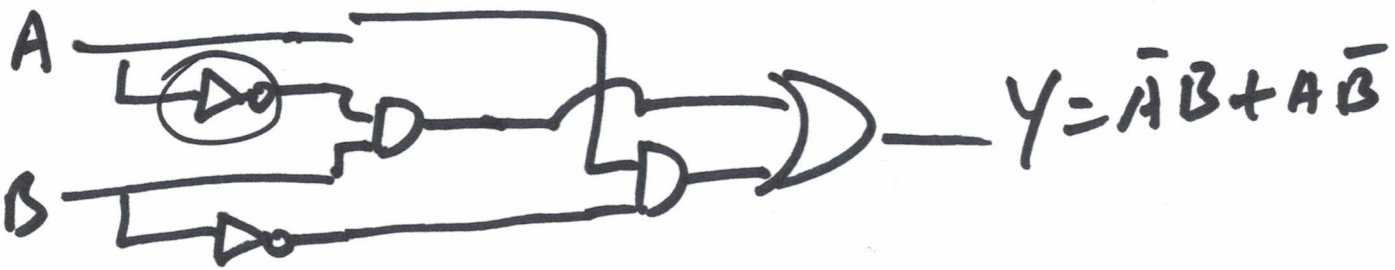
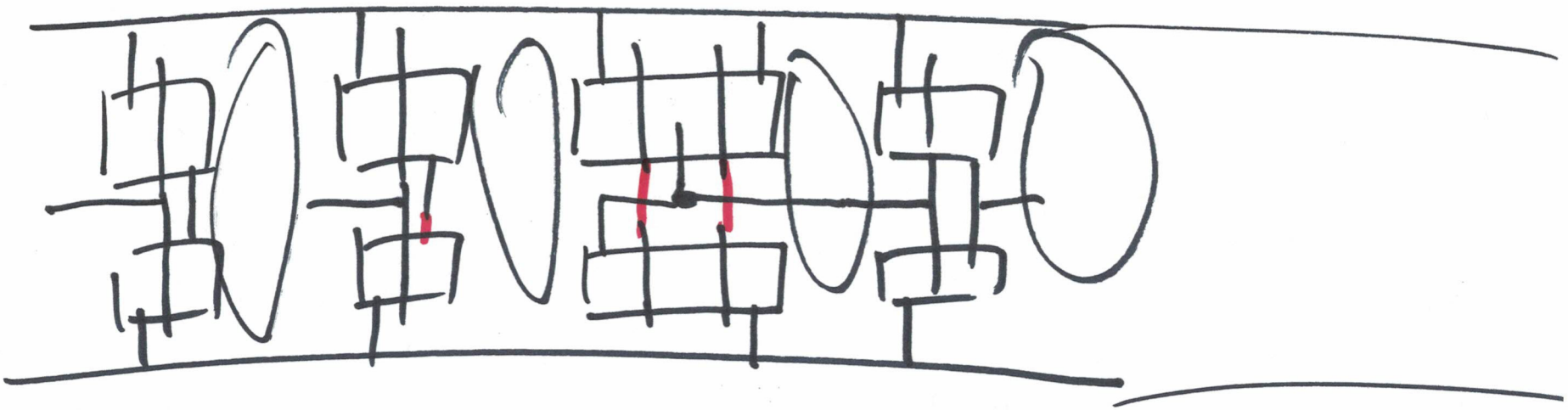
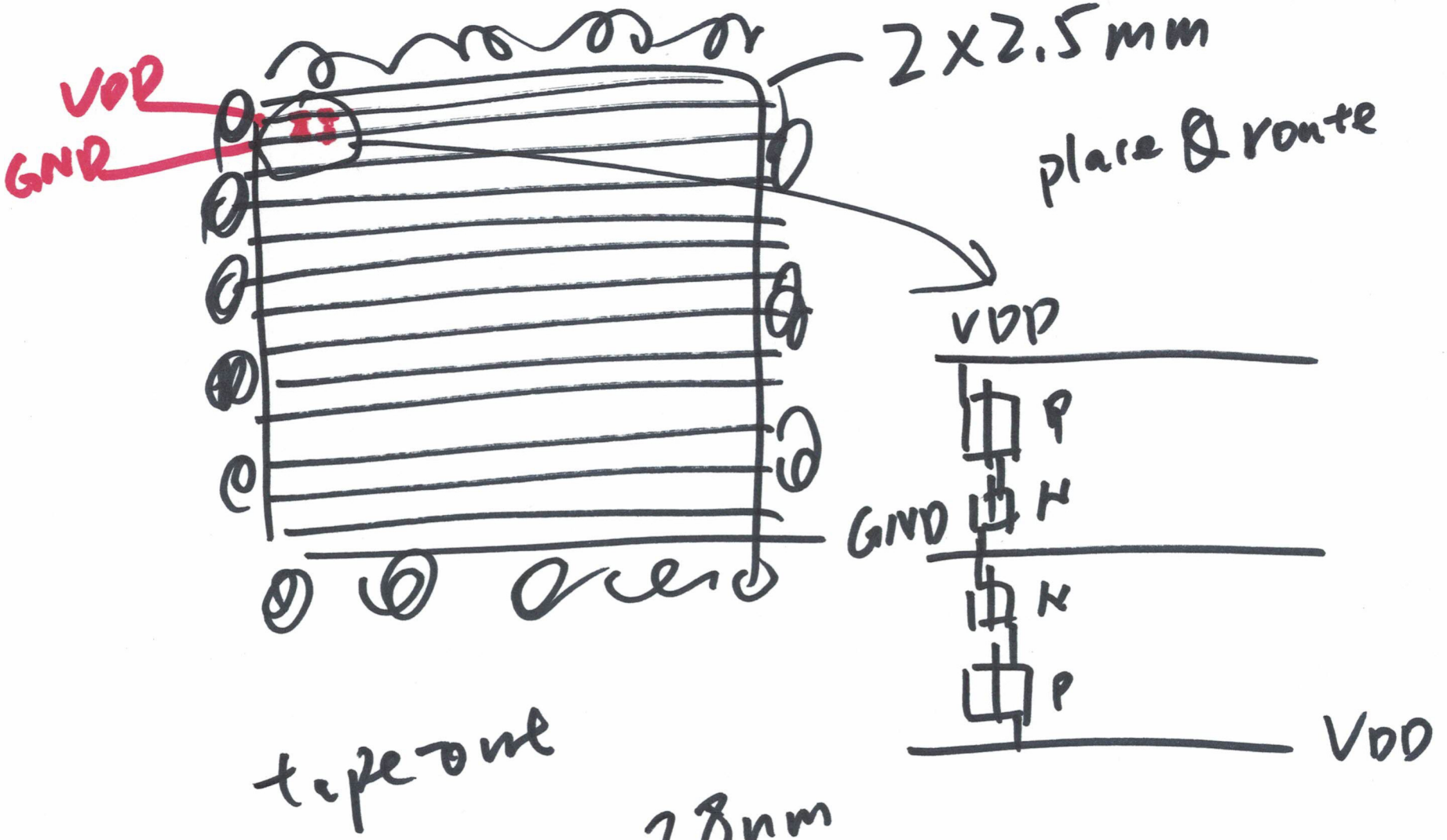
XOR: $Y = \bar{A}B + A\bar{B}$






VDD
GND
2x2.5mm
place & route
VDD
P
N
GND
N
P
VDD
tapeout
28nm

XOR: $Y = \overline{\bar{A}B + A\bar{B}}$

$= \overline{\bar{A}B} \cdot \overline{A\bar{B}}$

$= (\bar{\bar{A}} + \bar{B}) \cdot (\bar{A} + \bar{\bar{B}})$

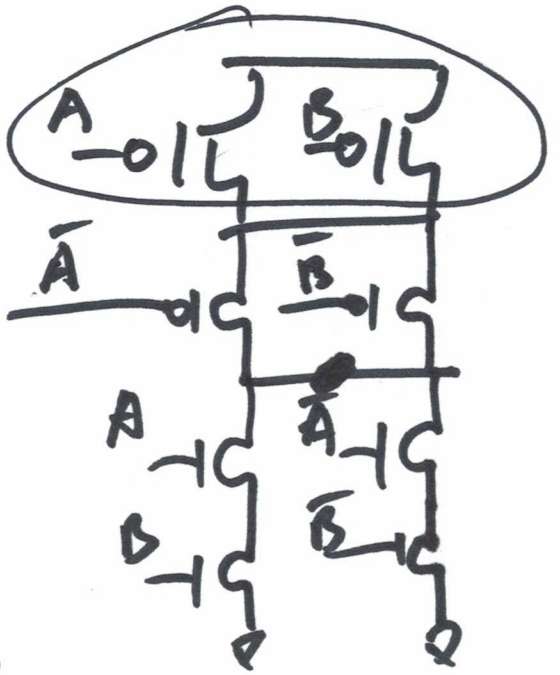
$= (A + \bar{B}) \cdot (\bar{A} + B)$

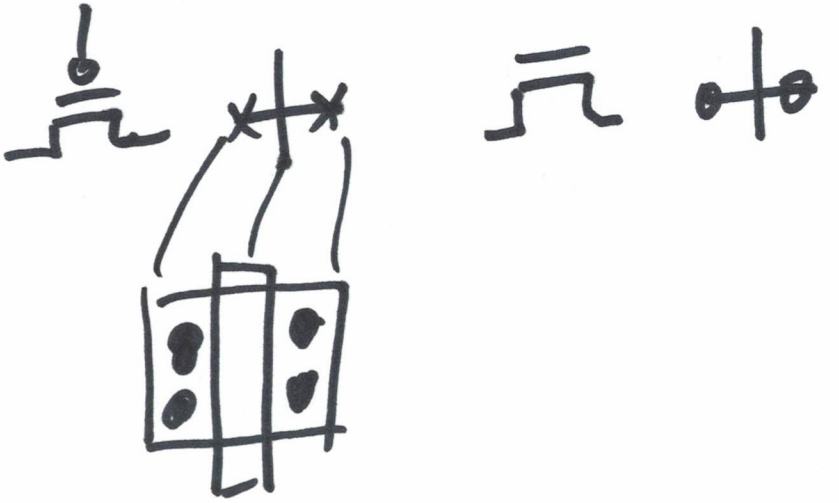
$= \cancel{A\bar{A}} + AB + \bar{A}\bar{B} + \cancel{B\bar{B}}$ (0)

$= A \cdot B + \bar{A} \cdot \bar{B}$ → XNOR

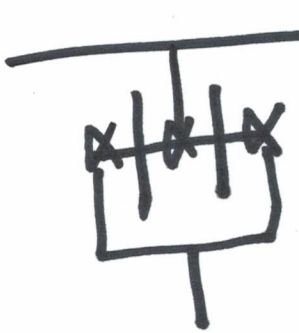
$A \oplus B = \overline{A \odot B}$

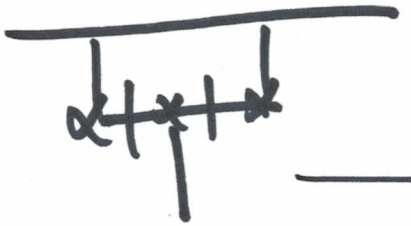
Stick diagrams

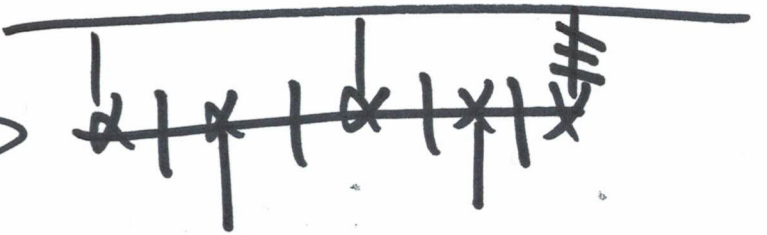




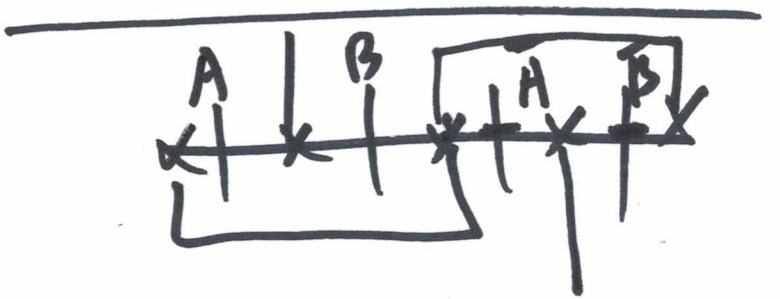
one-liner

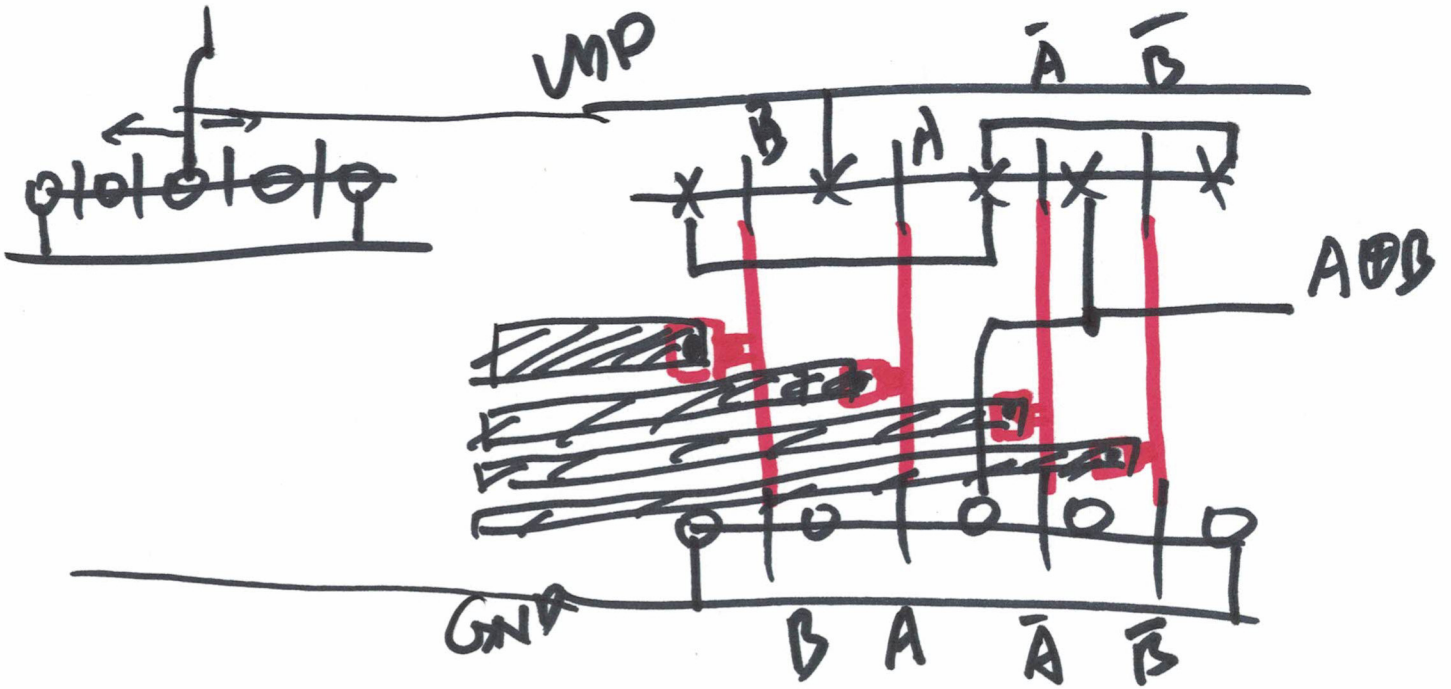
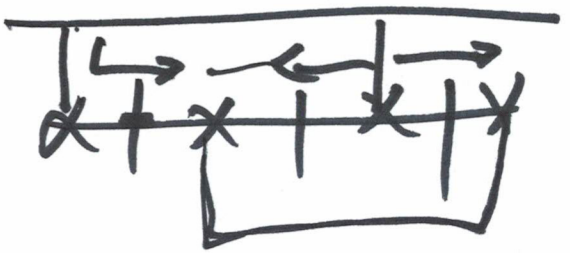
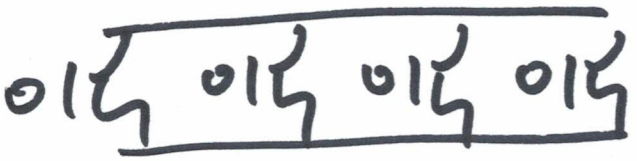
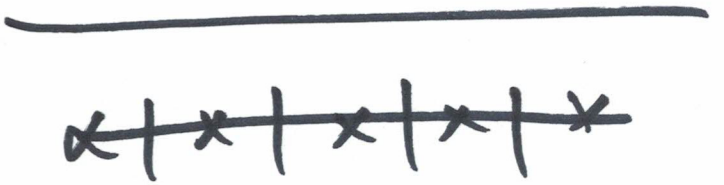






two parallel pmoses




VDD
$\bar{A}$ $\bar{B}$
B
A
A⊕B
GND
B A $\bar{A}$ $\bar{B}$