

# Cell Design

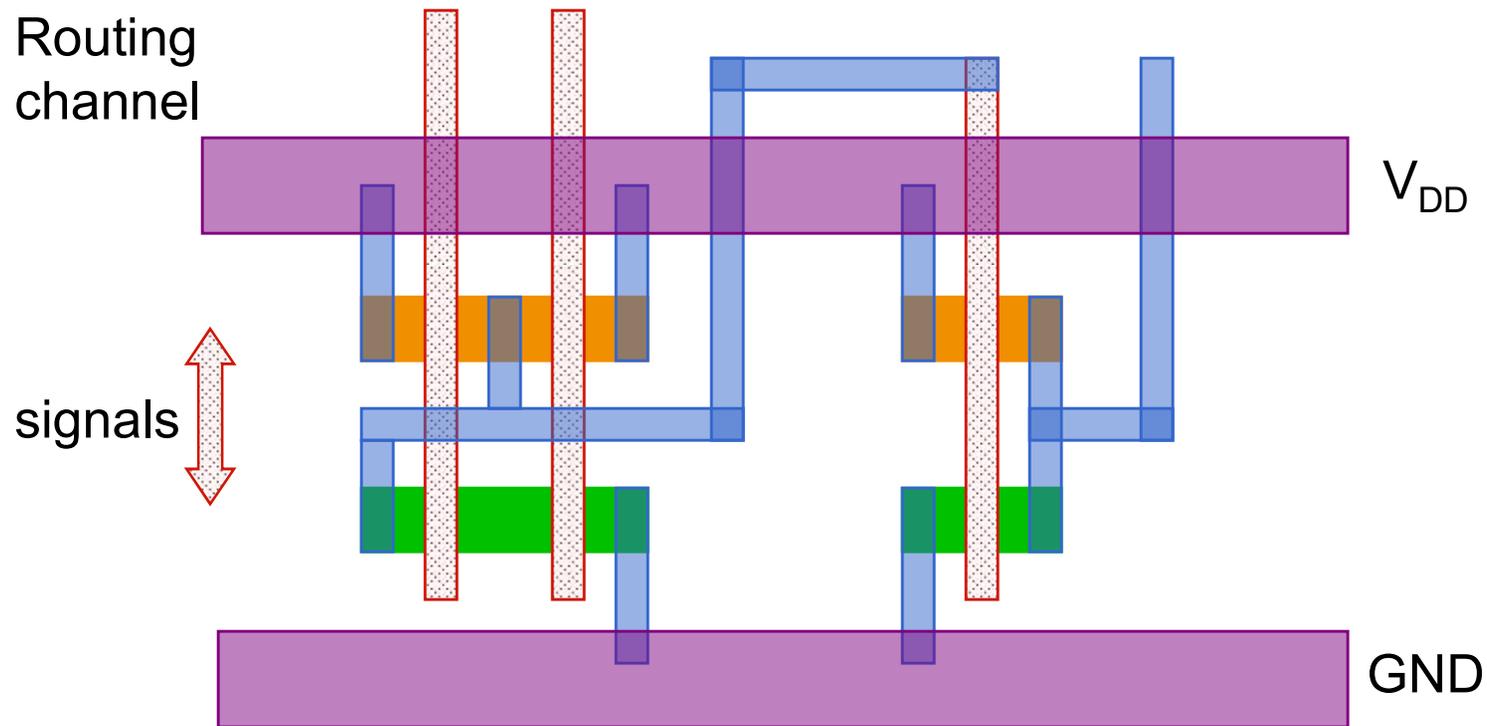
## □ Standard Cells

- General purpose logic
- Can be synthesized
- Same height, varying width

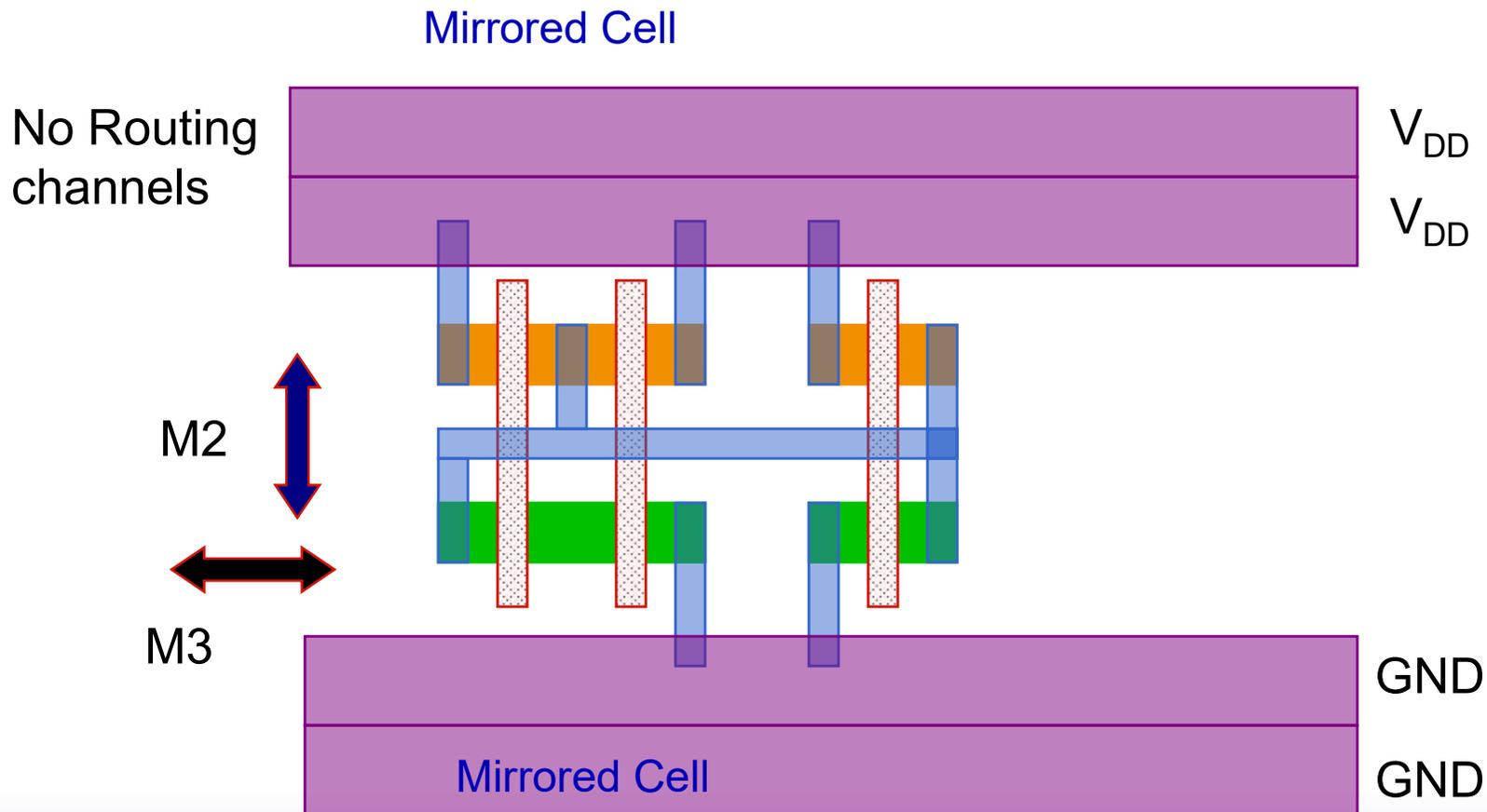
## □ Datapath Cells

- For regular, structured designs (arithmetic)
- Includes some wiring in the cell
- Fixed height and width

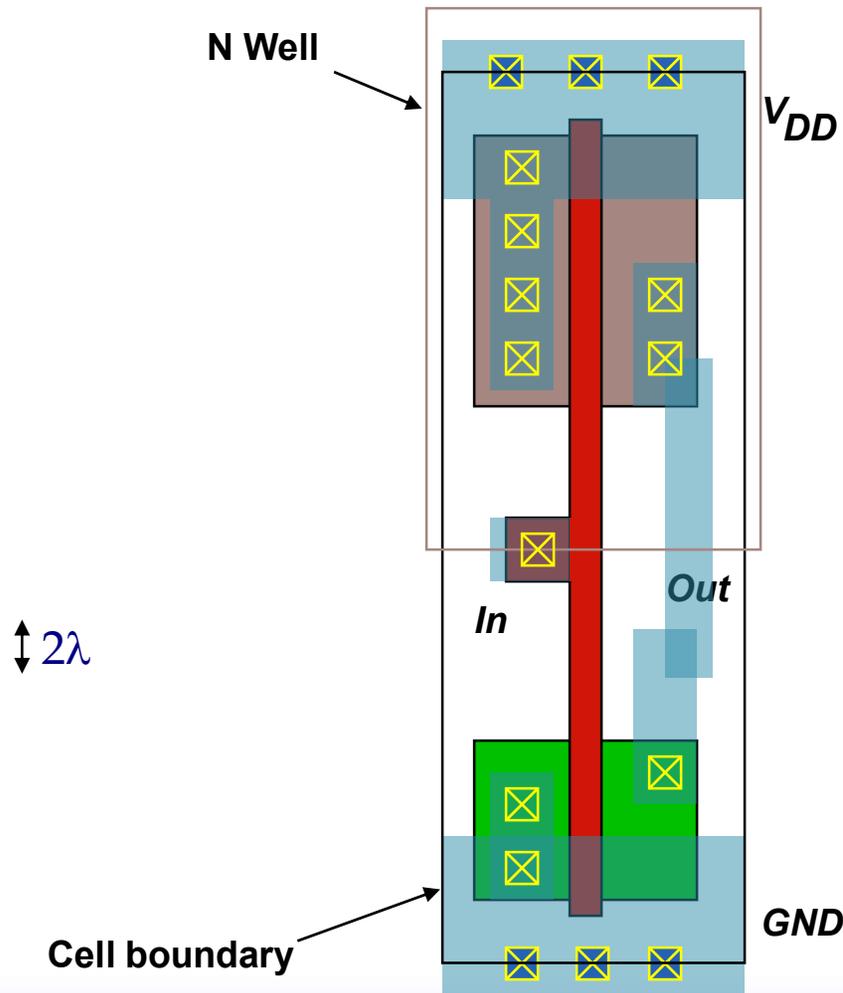
# Standard Cell Layout Methodology – 1980s



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# Standard Cells



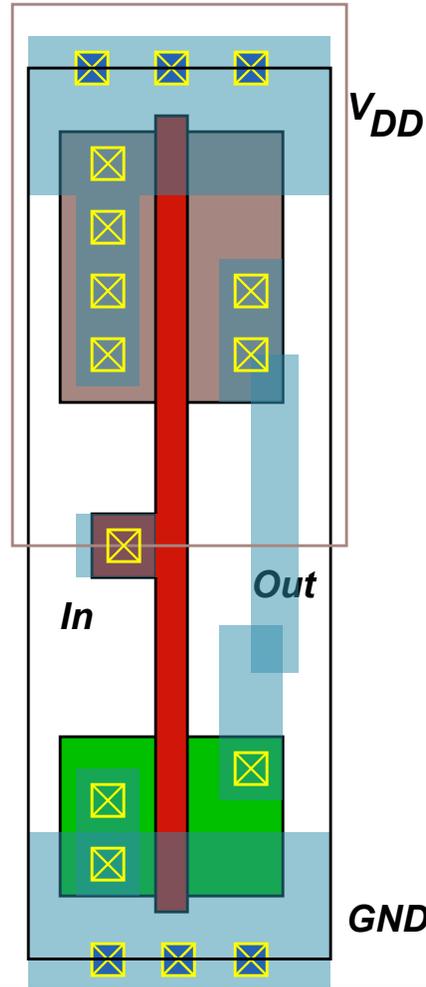
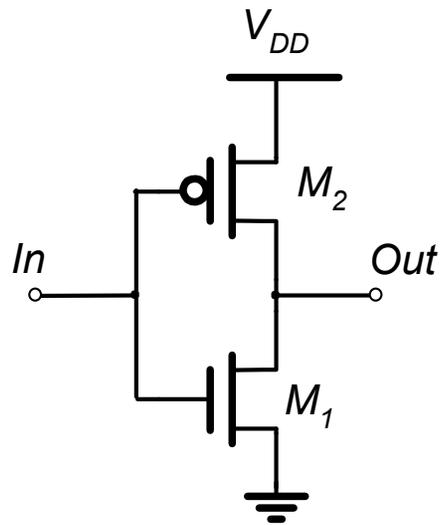
Cell height 12 metal tracks  
Metal track is approx.  $3\lambda + 3\lambda$   
Pitch =  
repetitive distance between objects

Cell height is "12 pitch"

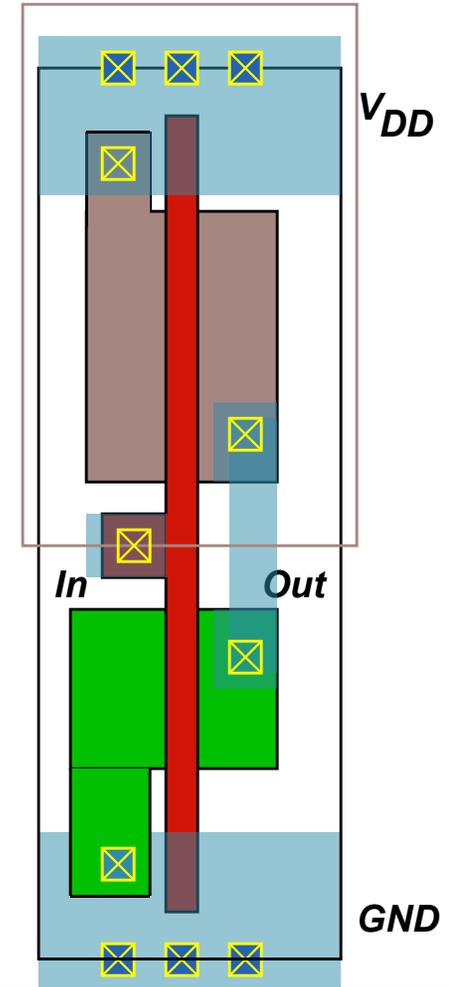
Rails  $\sim 10\lambda$

# Standard Cells

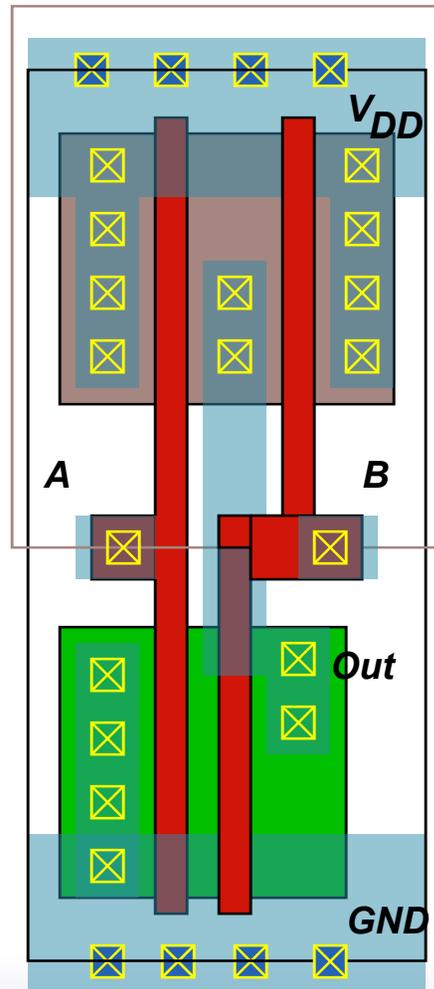
With minimal diffusion routing



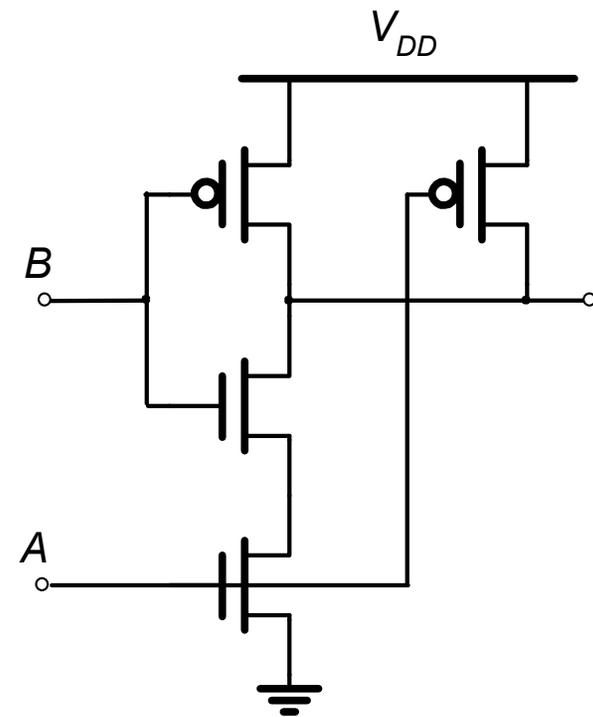
With silicided diffusion



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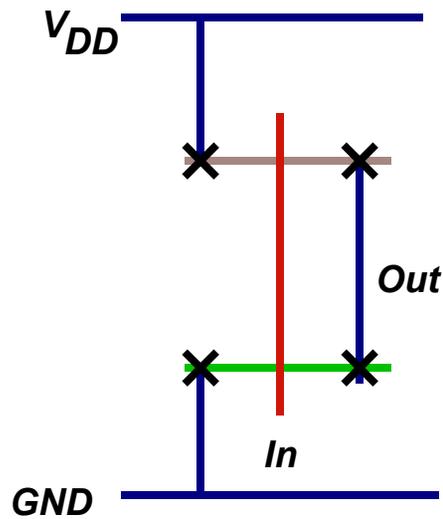
2-input NAND gate



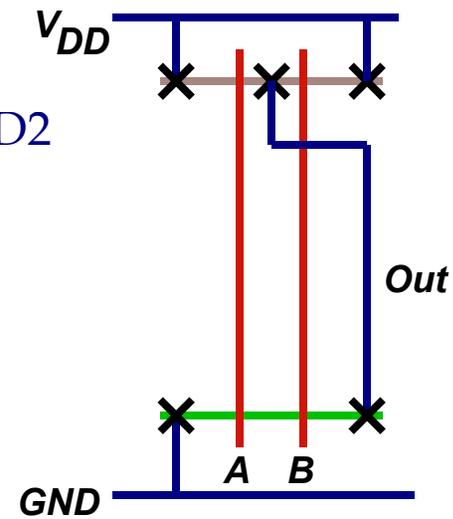
# Stick Diagrams

Contains no dimensions  
Represents relative positions of transistors

Inverter



NAND2



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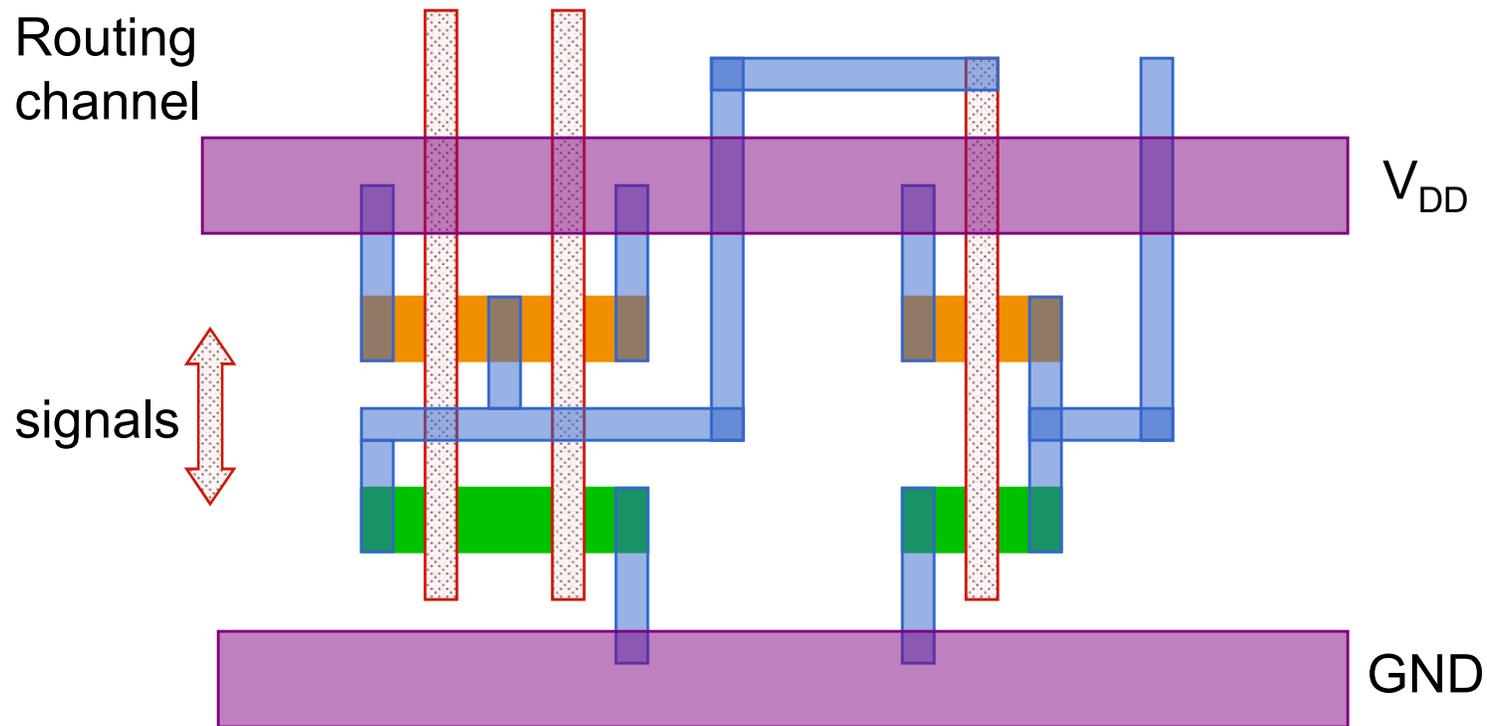
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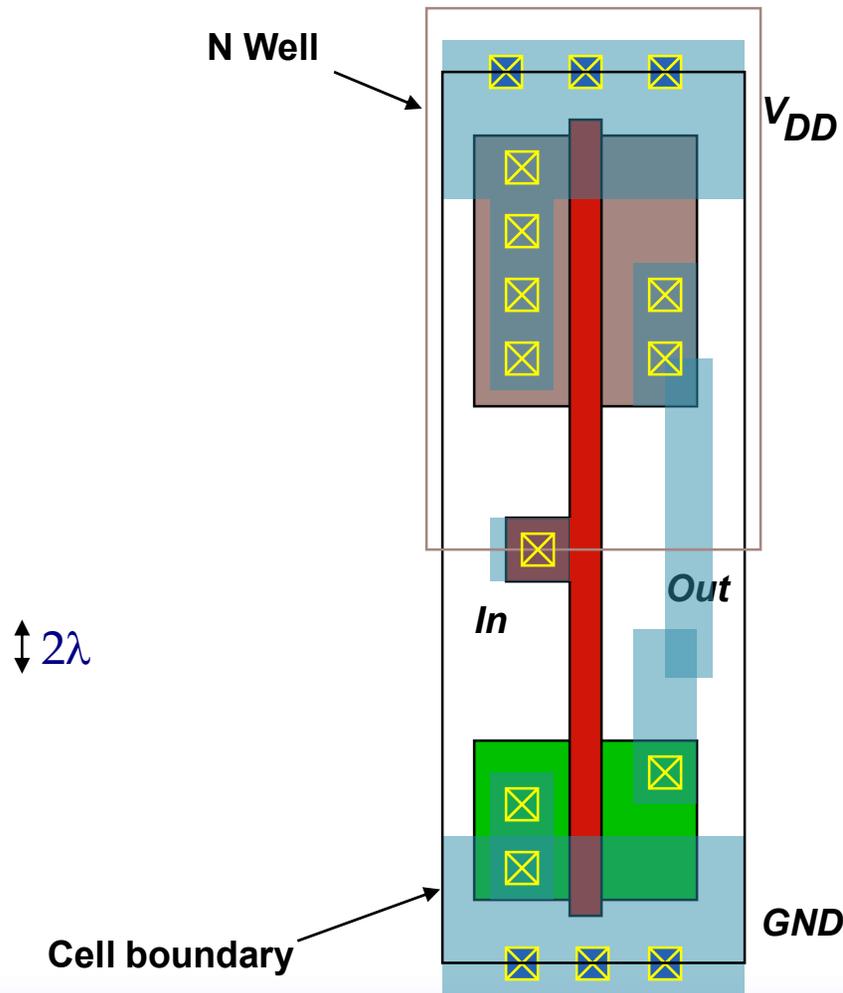
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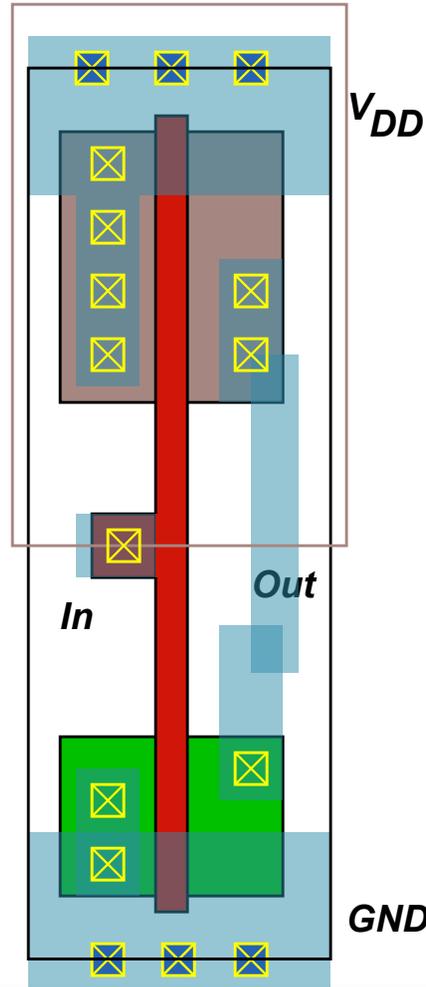
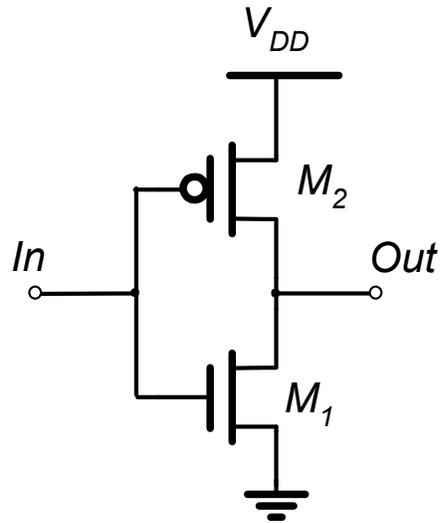
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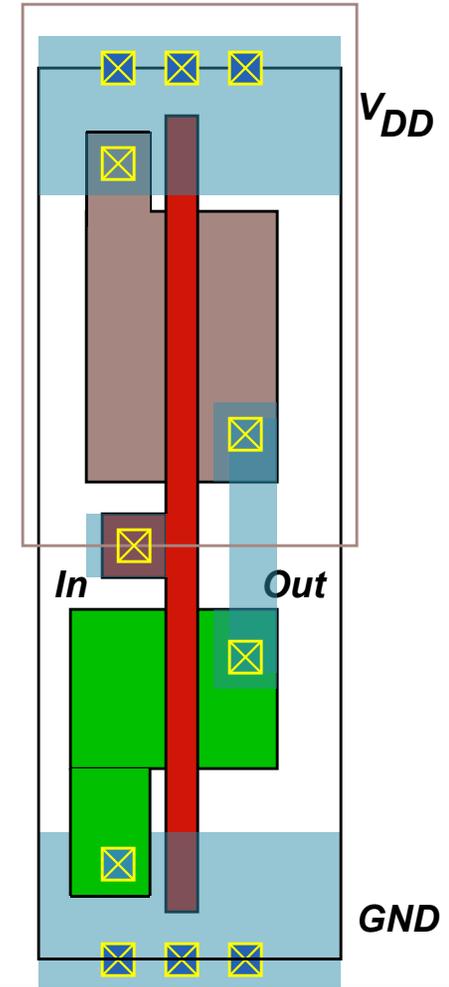
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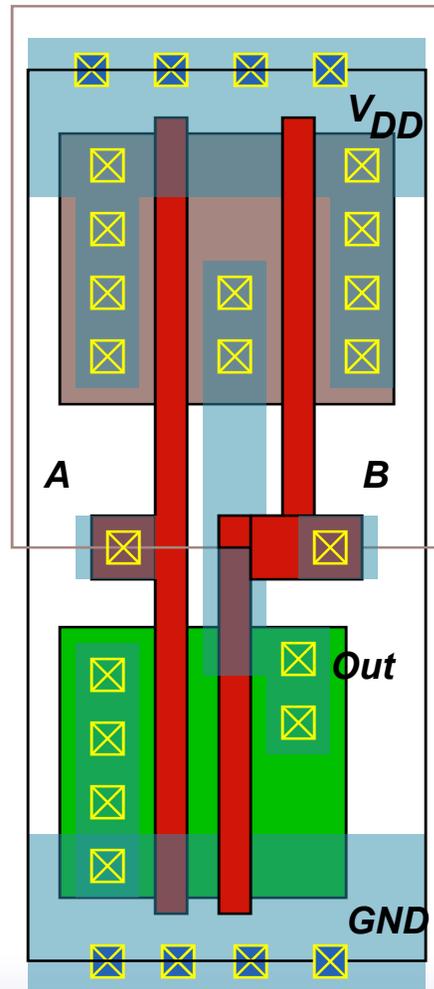
With minimal diffusion routing



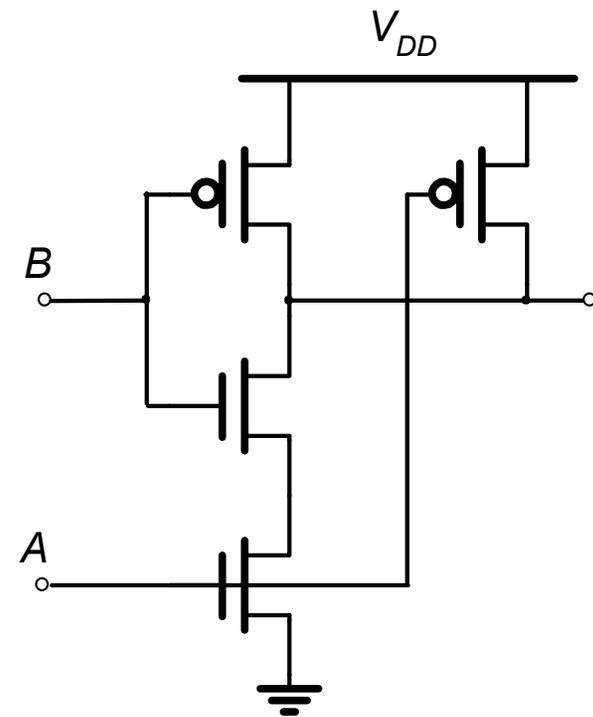
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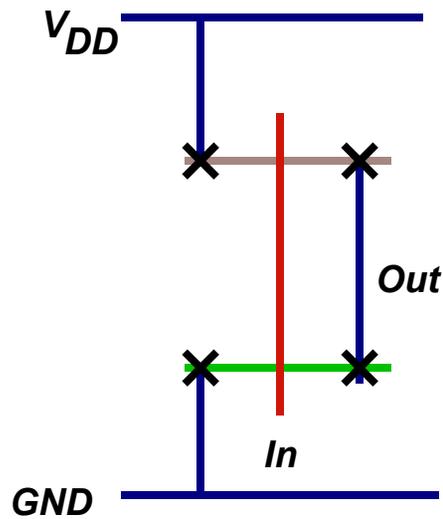
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