The University of Texas at Dallas

Dept of Electrical Engineering

EECT 6325: VLSI Design

Project 4

STANDARD CELL LIBRARY

Done by:

Names
Sameer Nitin Chourikar
Akilesh Sashank Akondi
Niket Kedarnath Ramani

Objective :

In this project, we drew the layout of 8 cells (INV, NAND2, NOR2, XOR2, MUX2:1, OAI211, OAI21, AOI22) with the same height. As per the requirement the height of p diffusion accommodates 5 contacts and the height of n diffusion accommodates 3 contacts. These 8 cells functionalities were verified by simulating using HSPICE. We also created the abstract views in Cadence and generated .lib file using Siliconsmart ACE.

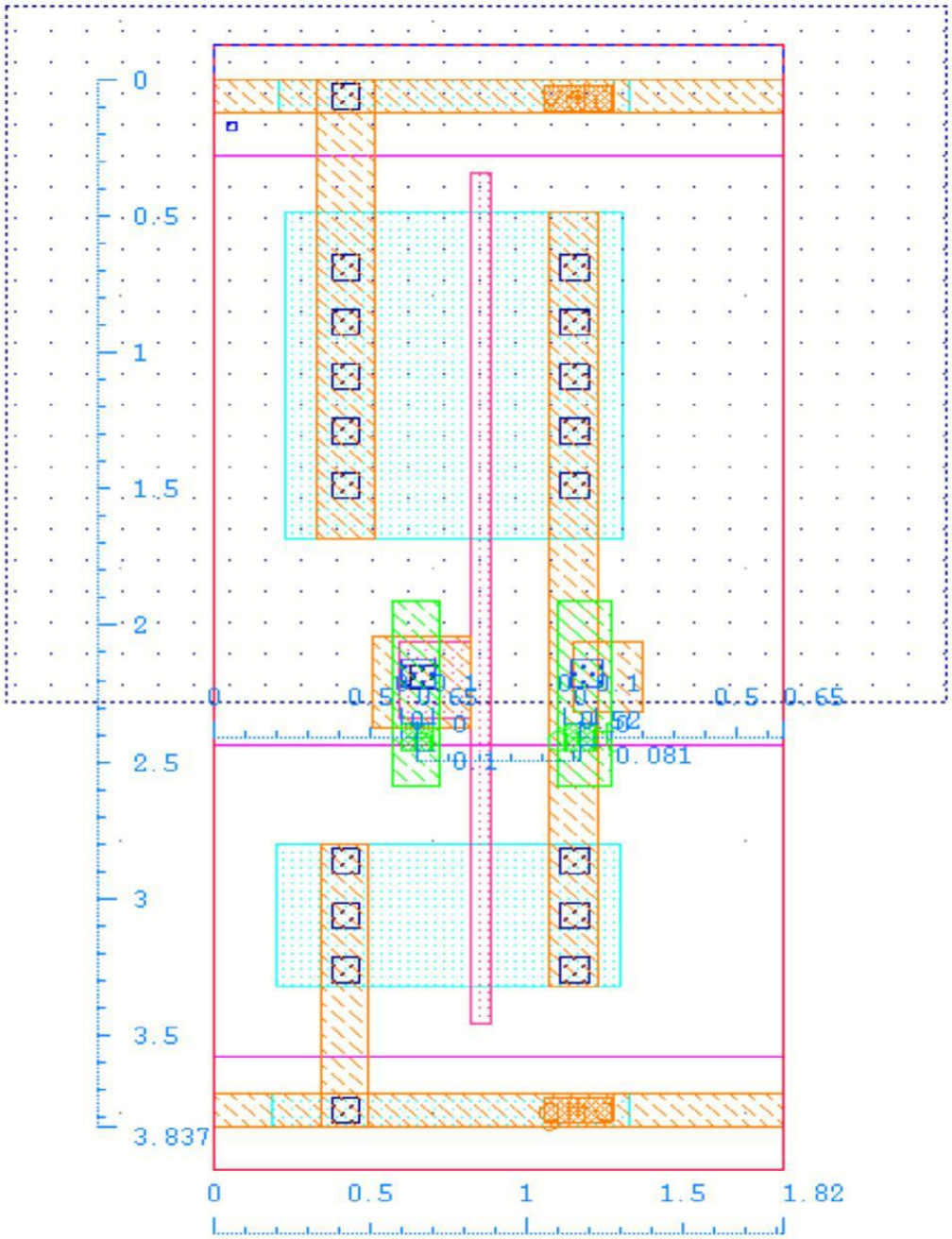
Procedure :

1. The Layout of the cells was drawn in Virtuoso
2. The Schematic for the same is drawn in Virtuoso using the same widths as used in the layout.
3. The DRC and LVS were successfully completed without errors.
4. Then the Spice file was extracted using QRC in Virtuoso.
5. After extracting the Spice file, we see the simulation results using Waveform viewer
6. The Layout was then modified to meet these specifications and the minimum area of the cells was obtained.
7. Using Silicon Ace software generate .lib (library) file.
8. .lib file is converted to .db file using Synopsys.

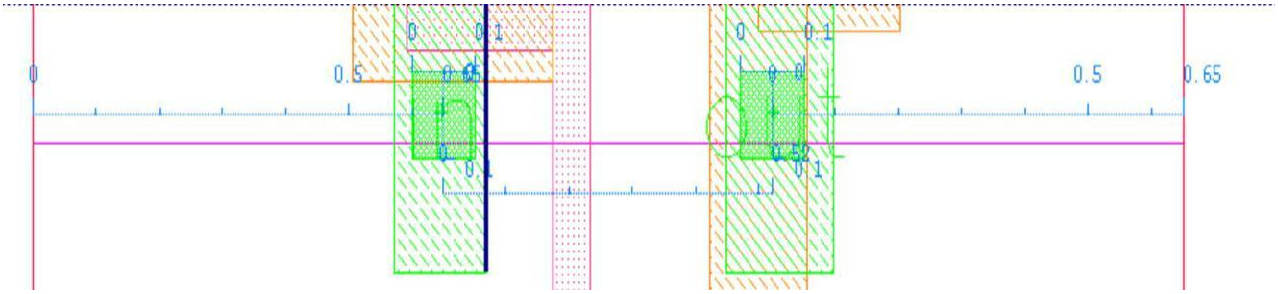
Layouts and Waveforms of the Cells :

Inverter :

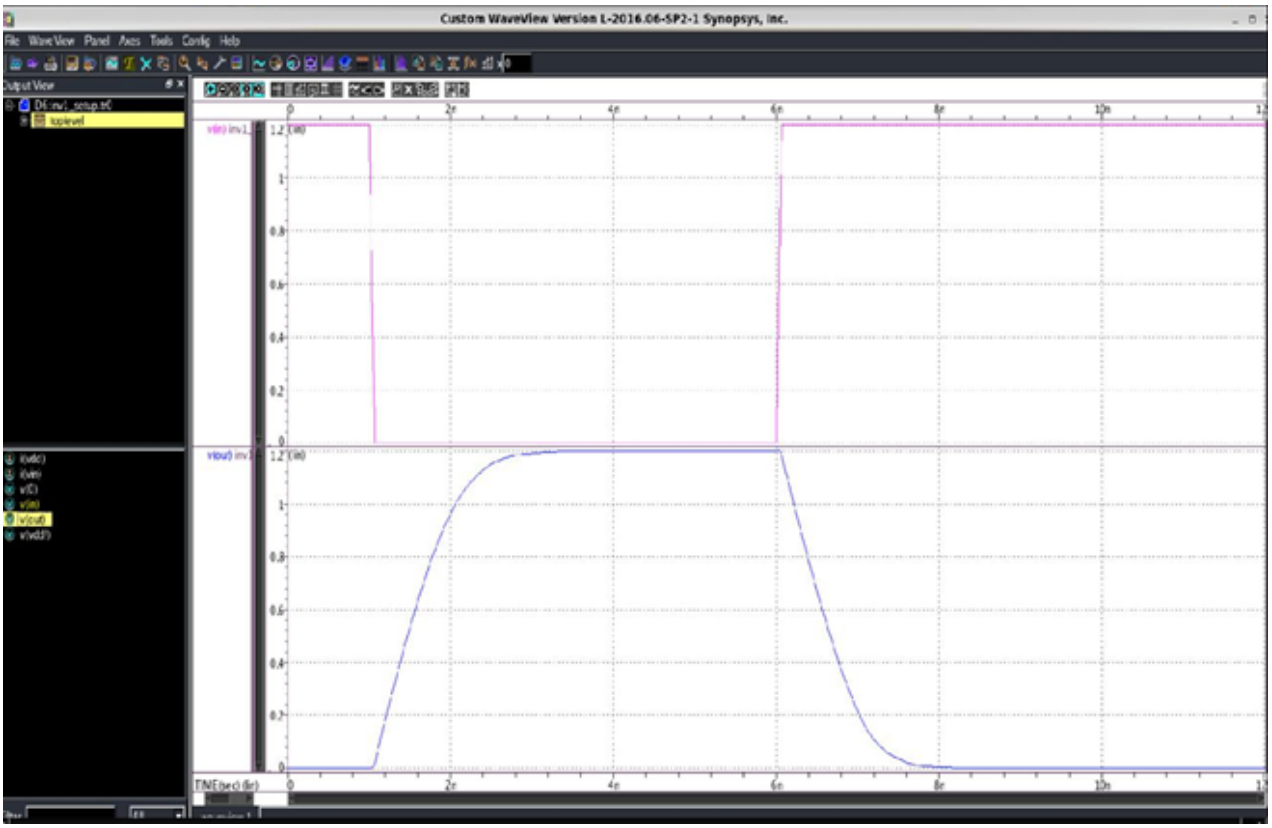
Layout view of inverter



Pin to pin distance of inverter

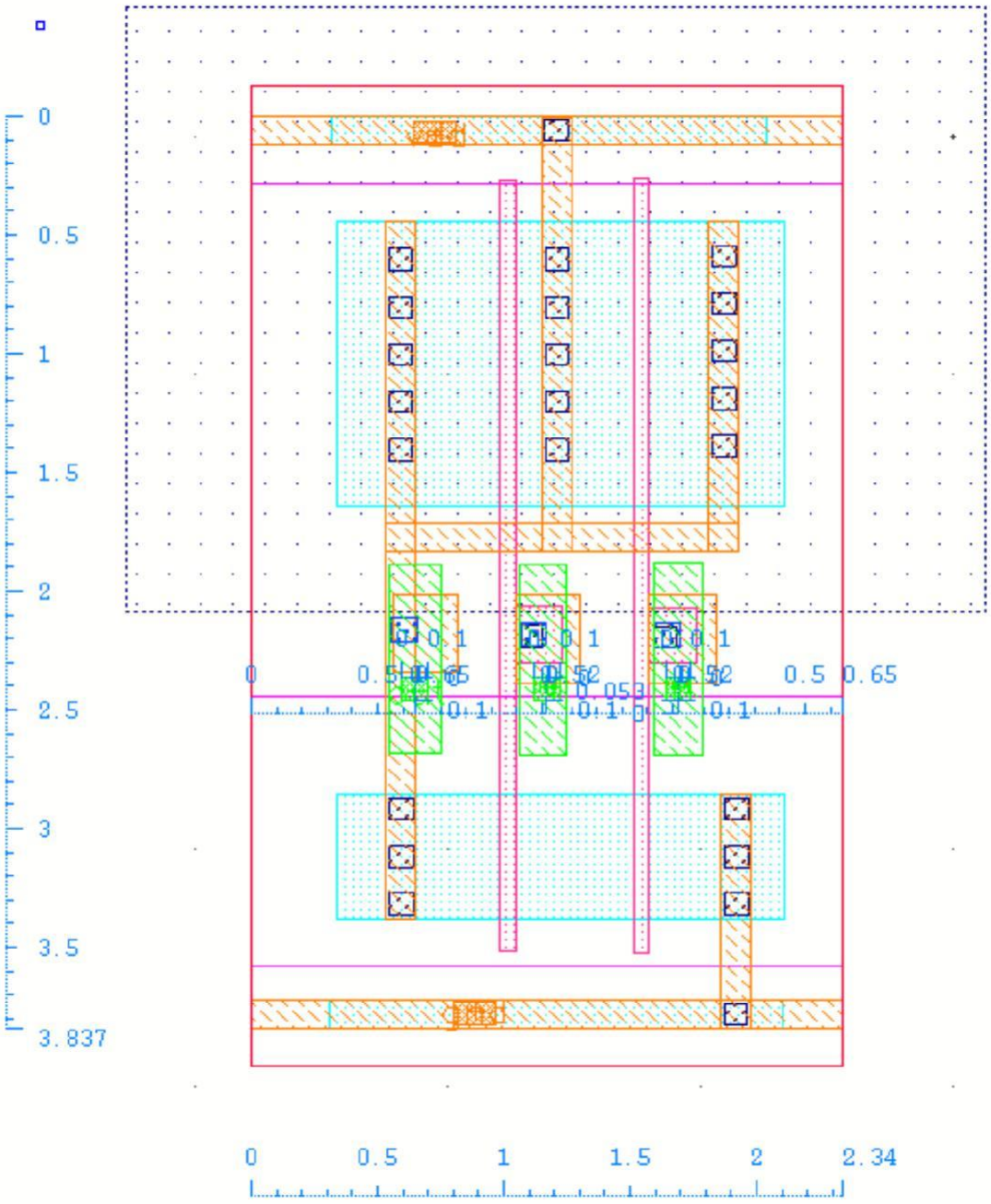


Waveform of inverter

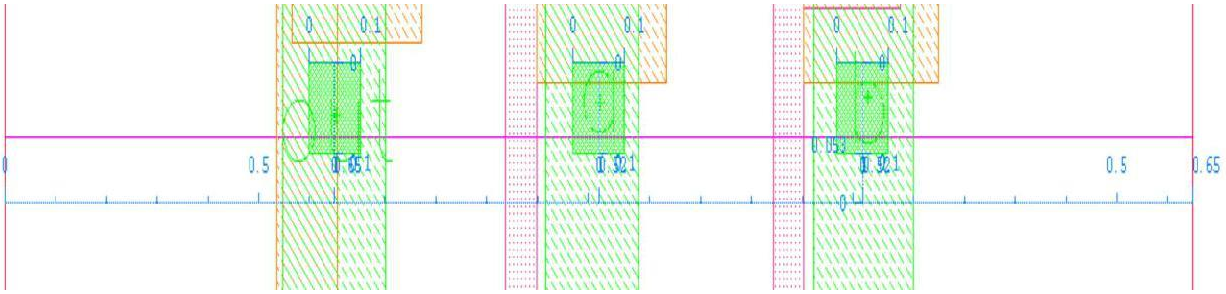


NAND 2 :

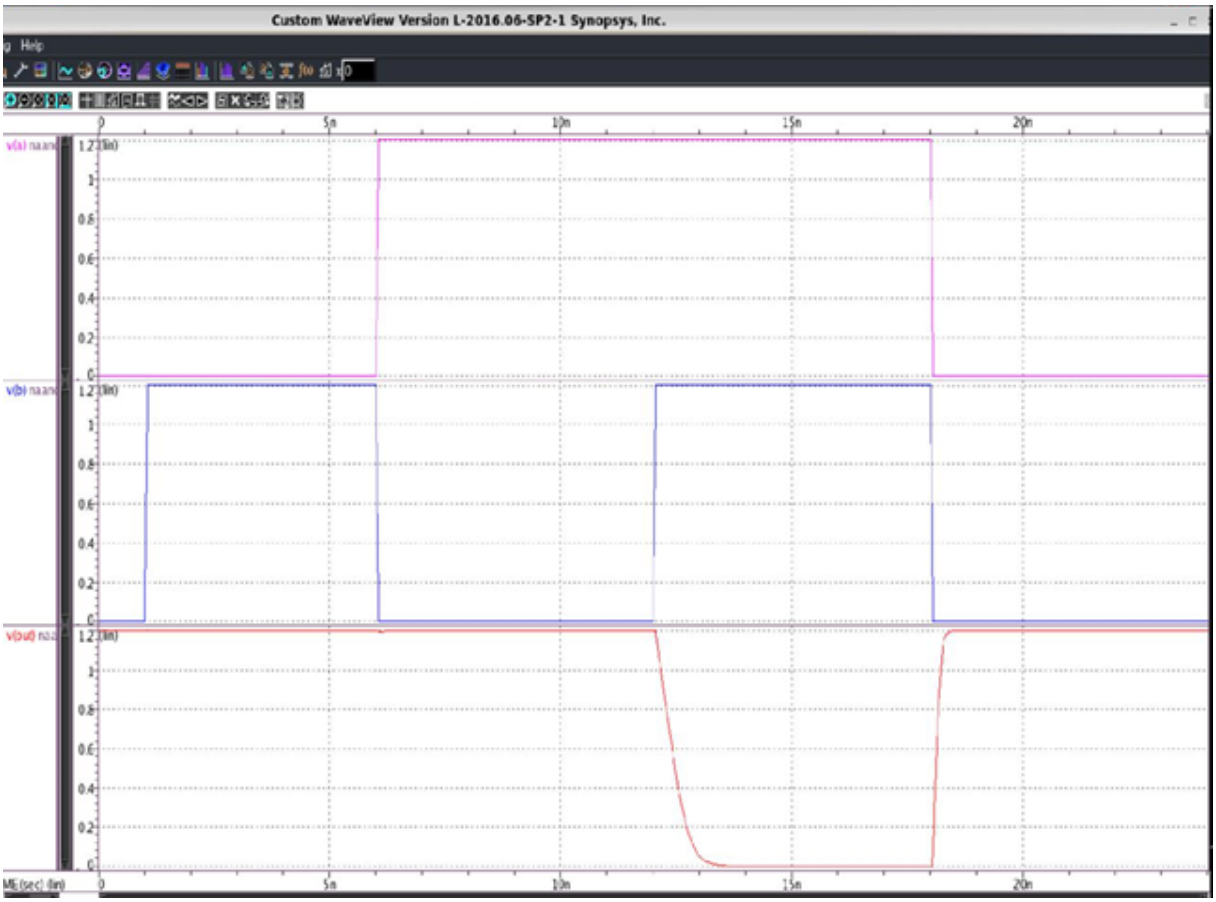
Layout view of NAND 2



Pin to pin distance of NAND 2

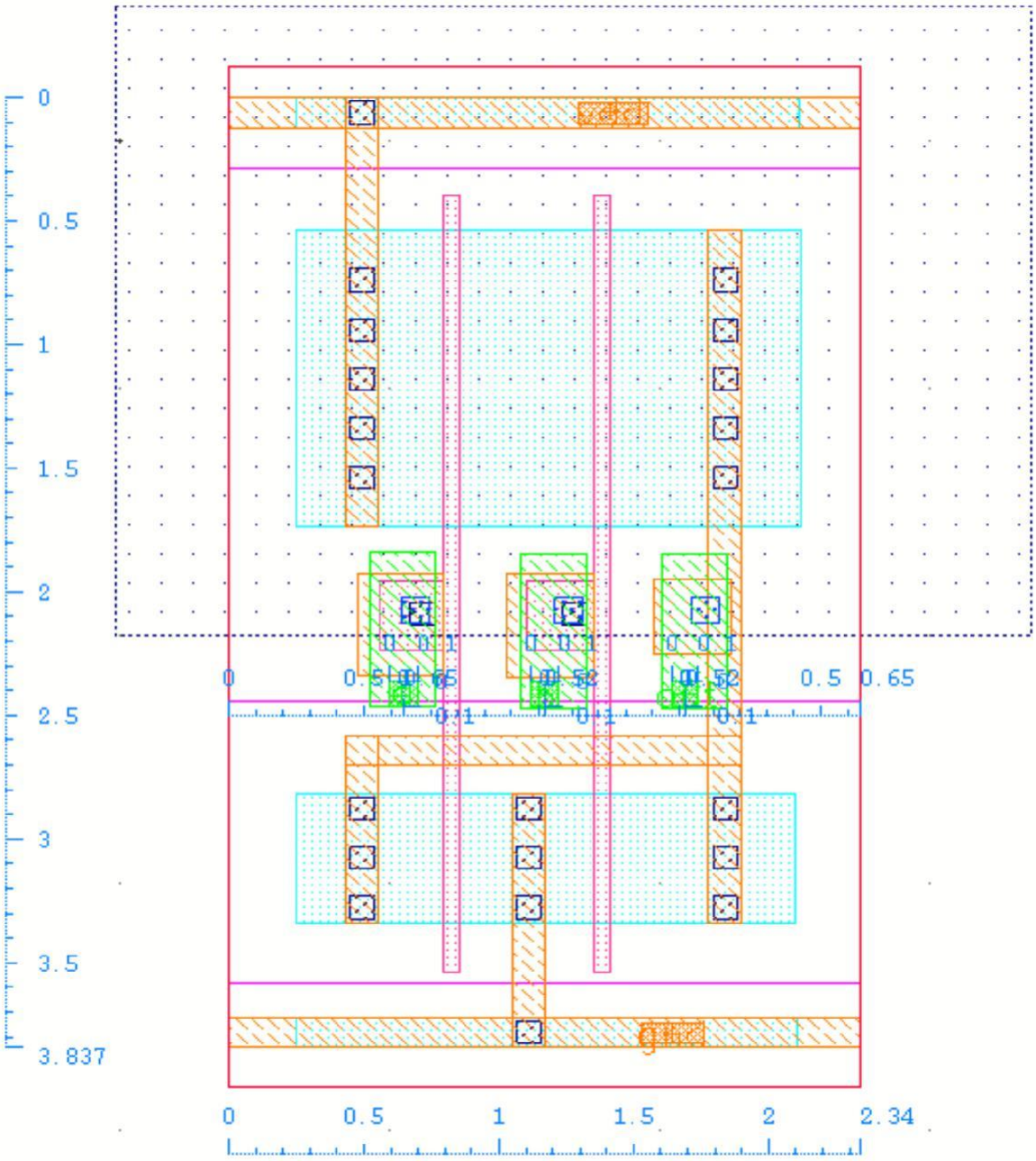


Waveform of NAND 2

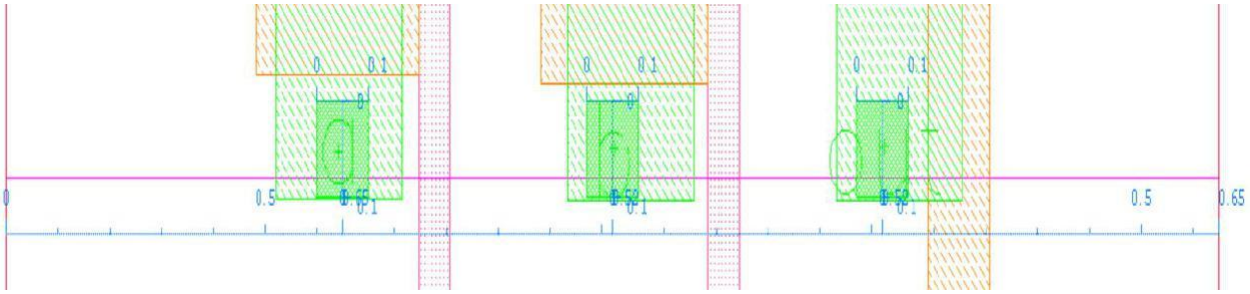


NOR2:

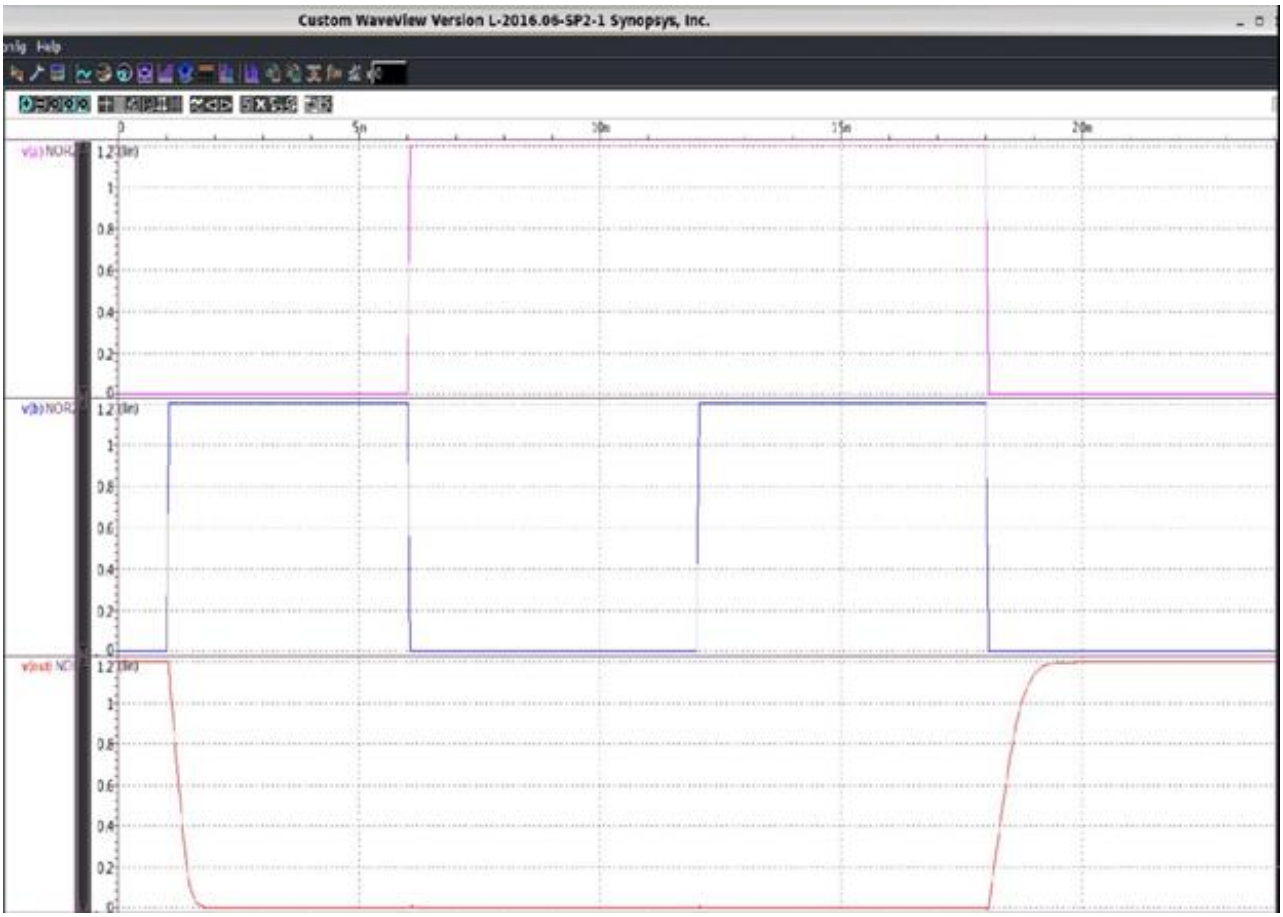
Layout view of NOR 2



Pin to pin distance of NOR 2

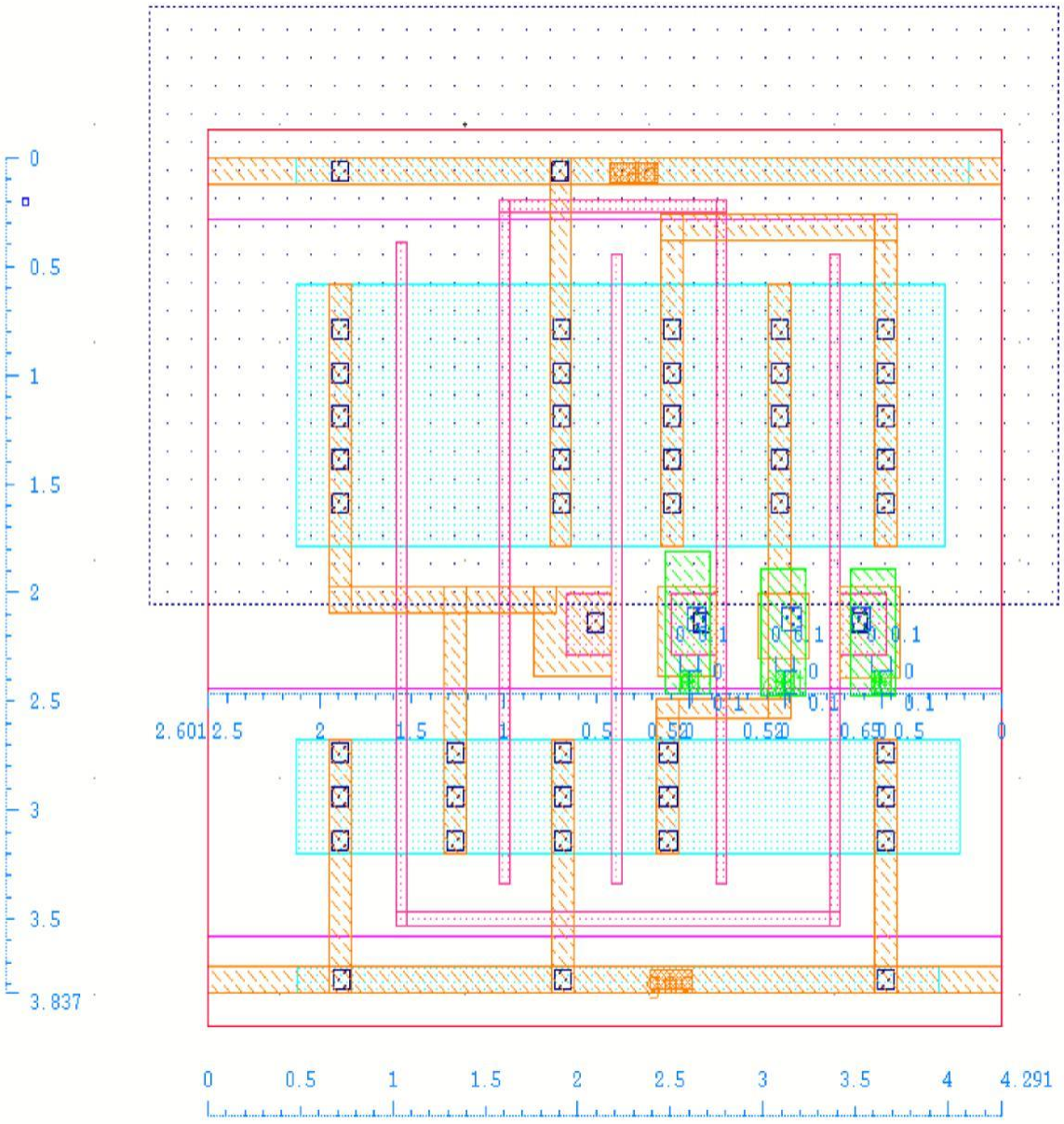


Waveform of NOR 2

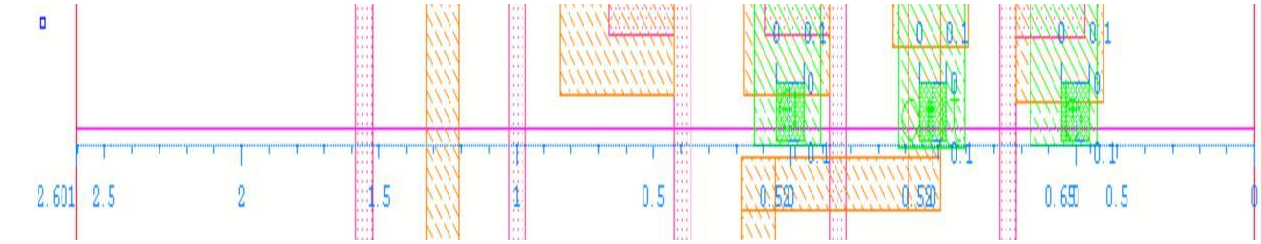


XOR2:

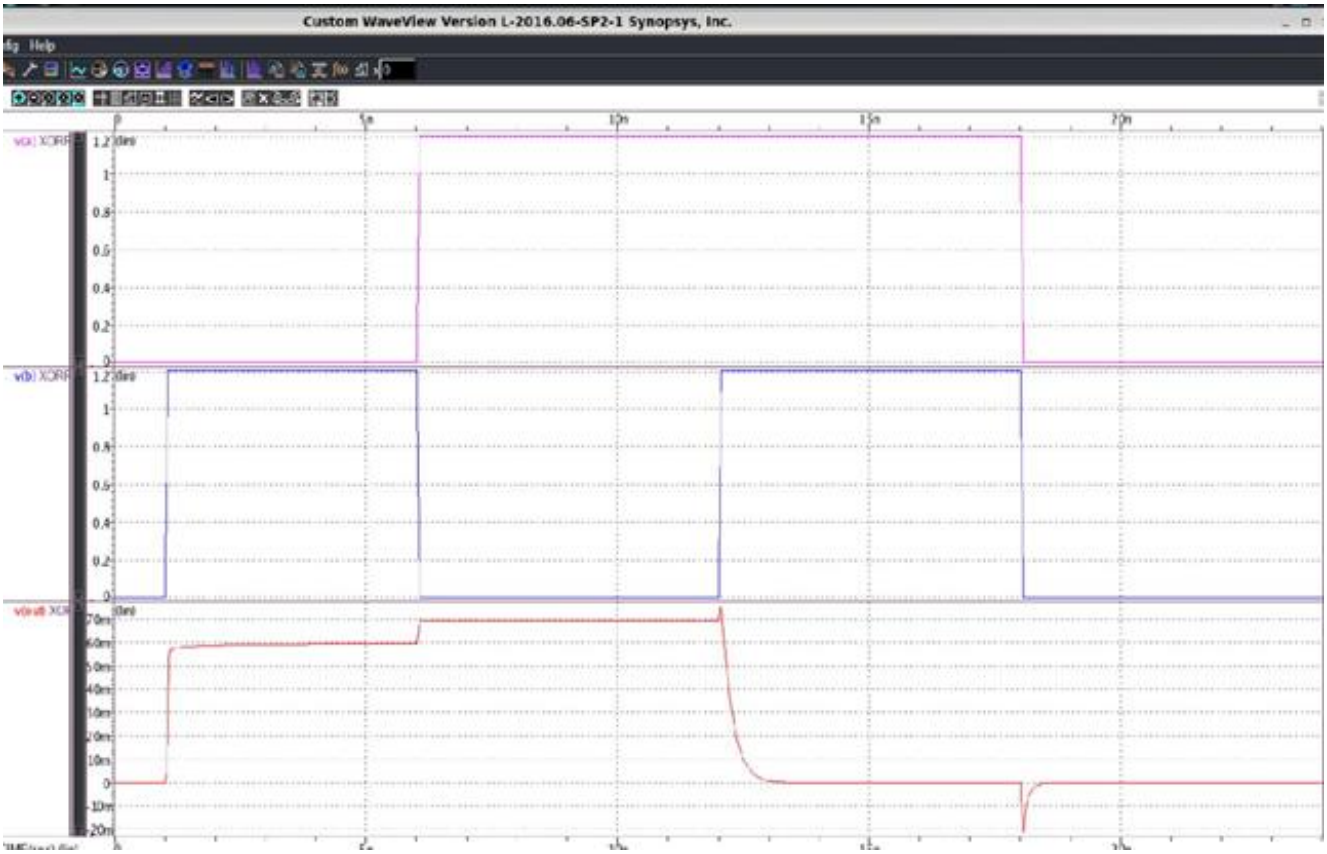
Layout view of XOR 2



Pin to pin distance of XOR 2

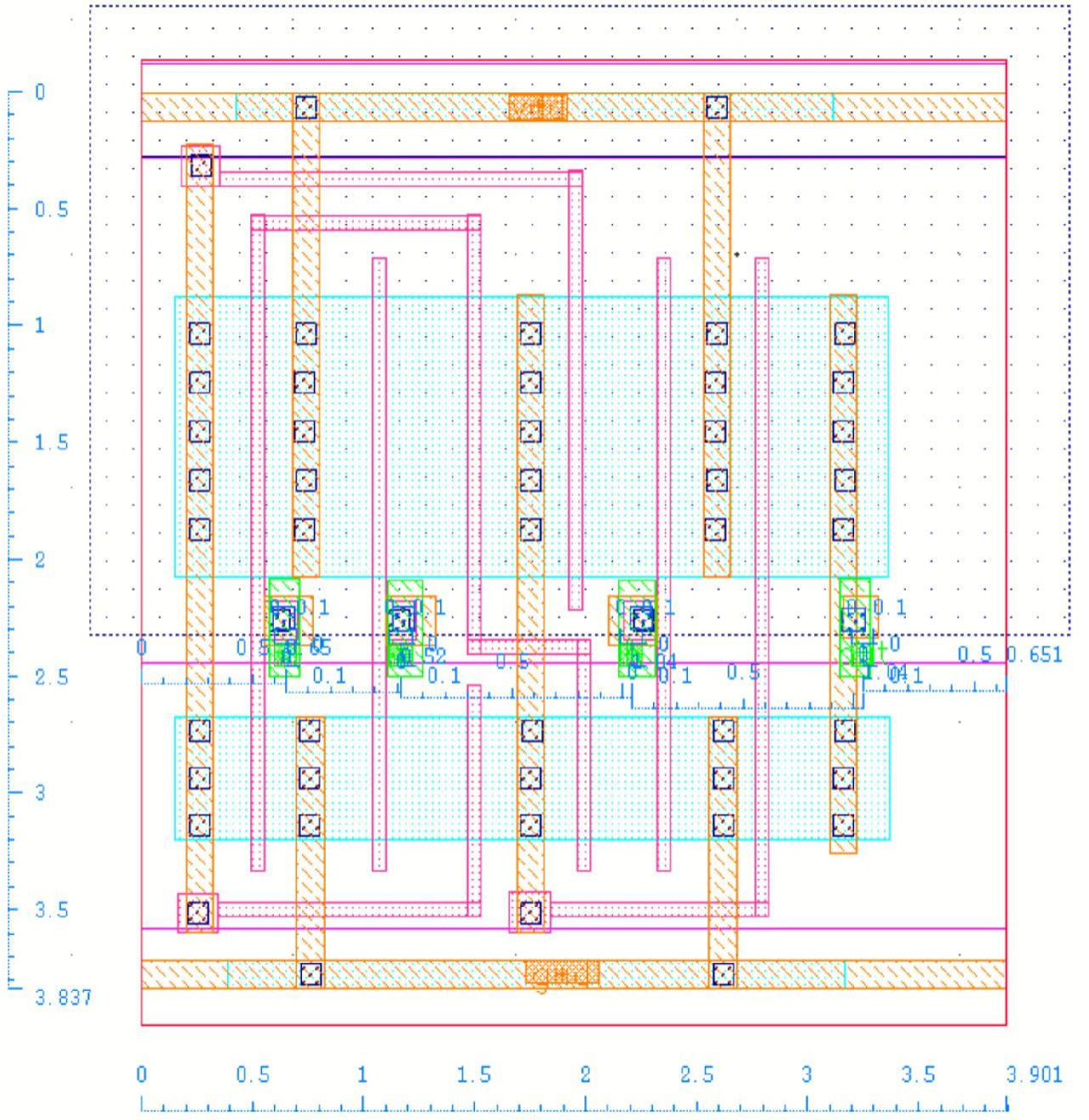


Waveform of XOR 2

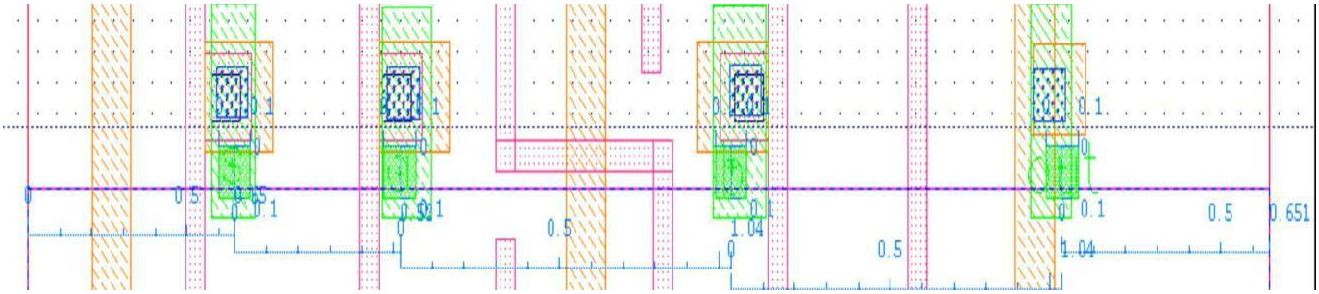


MUX 2:1 :

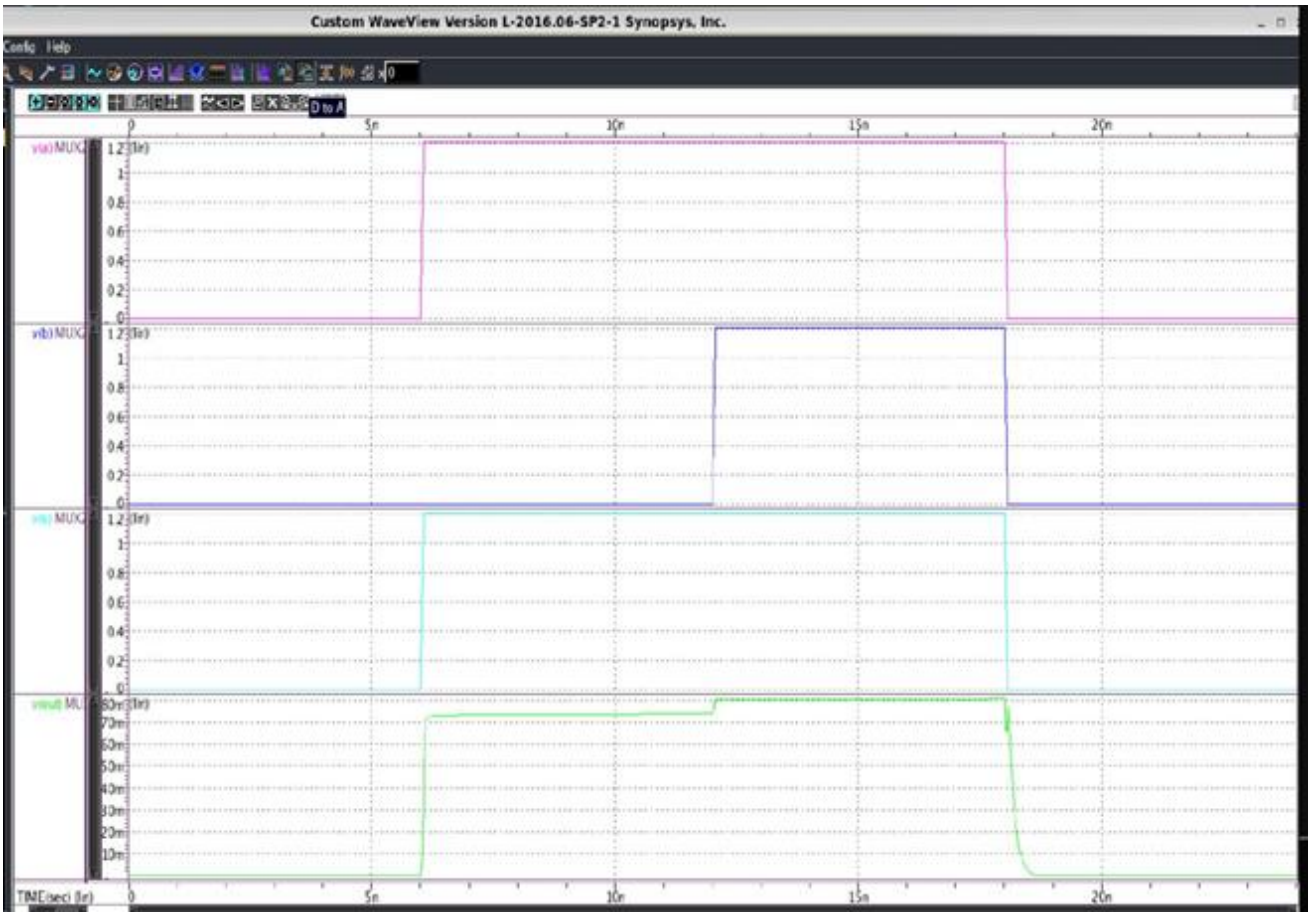
Layout view of MUX 2:1



Pin to pin distance of MUX 2:1

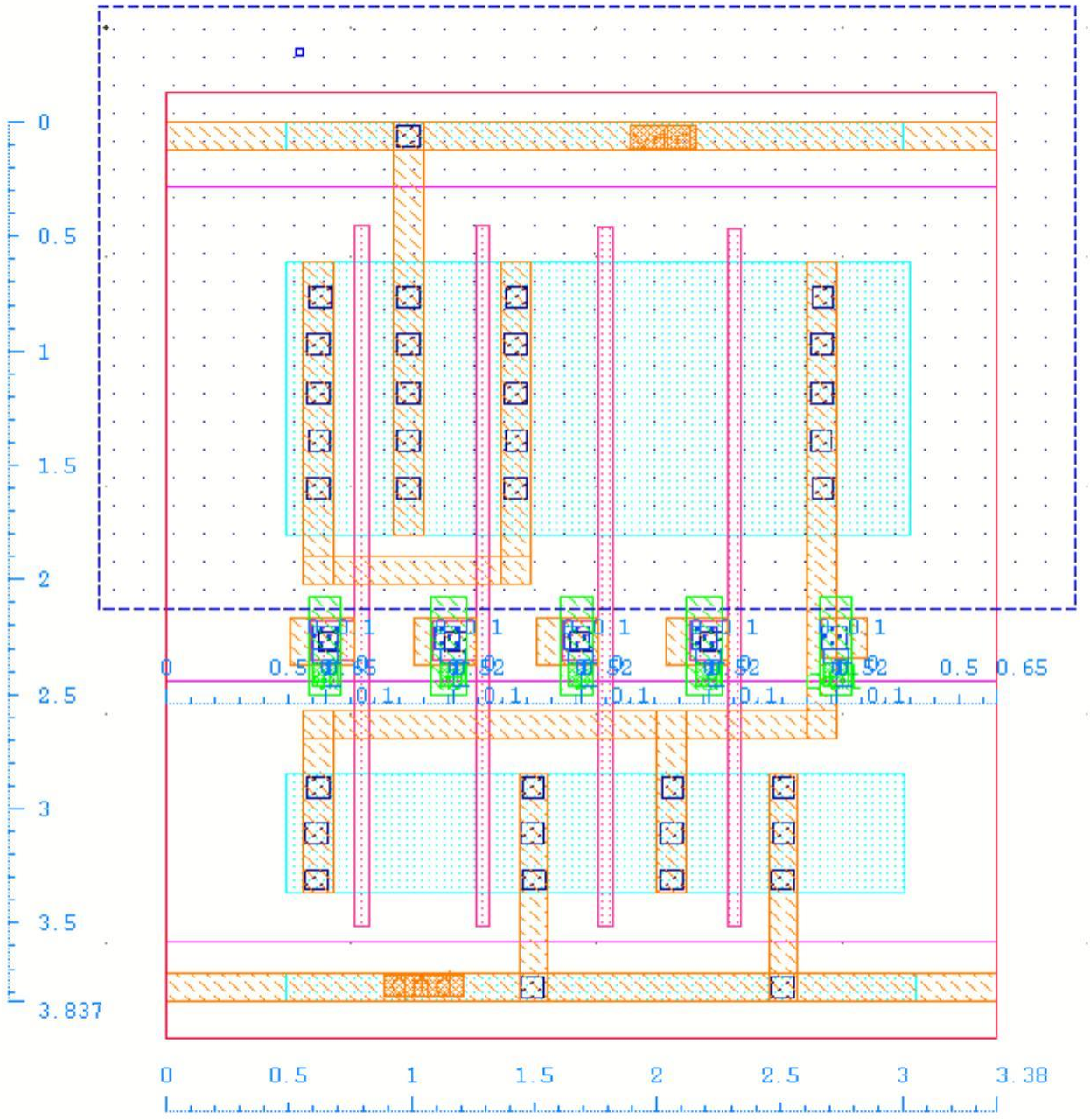


Waveform of MUX 2:1

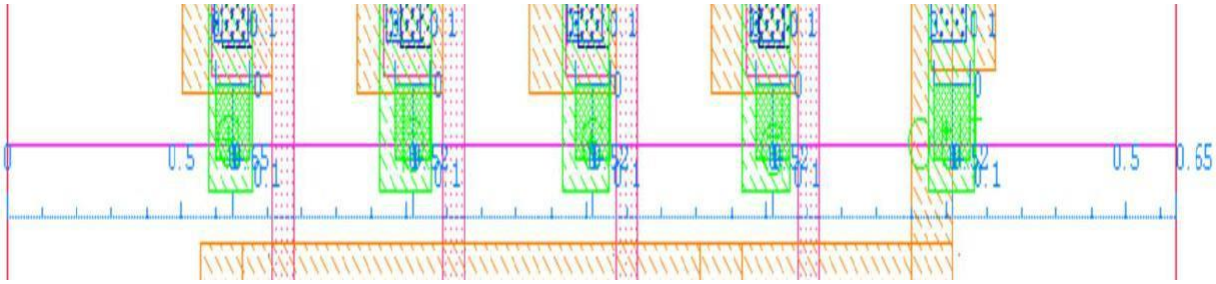


AOI 211 :

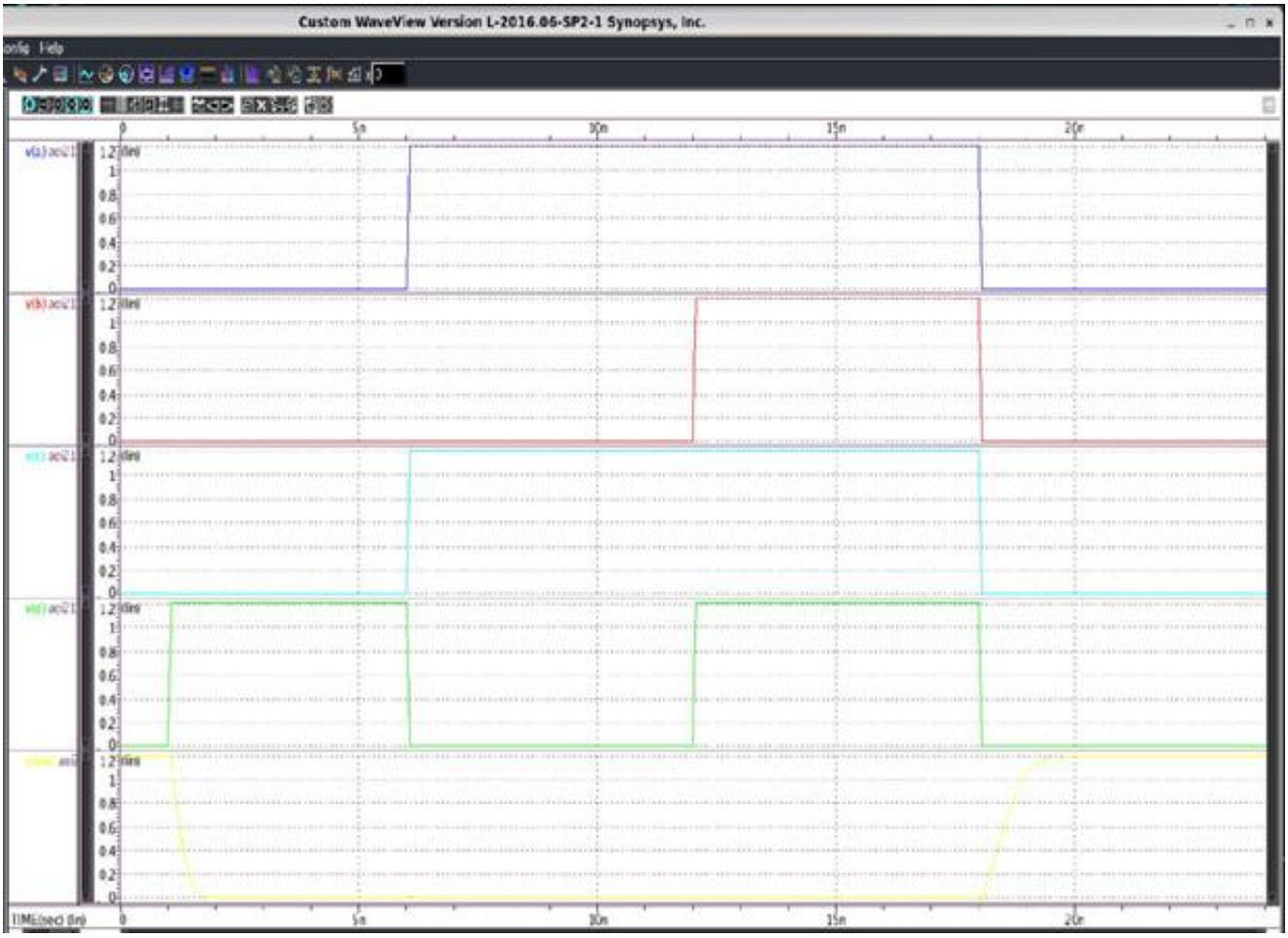
Layout view of AOI 211



Pin to pin distance of AOI 211

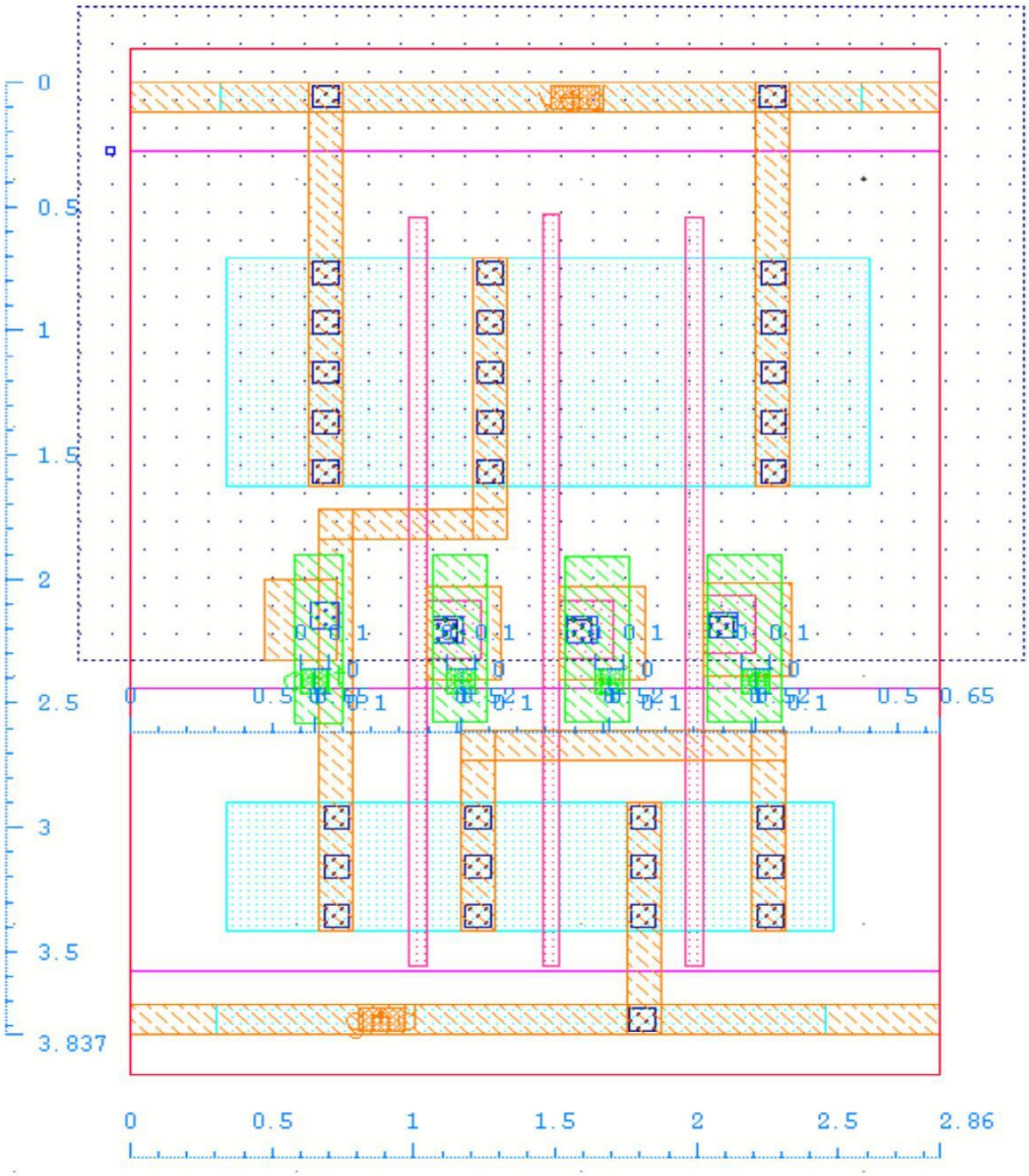


Waveform of AOI 211

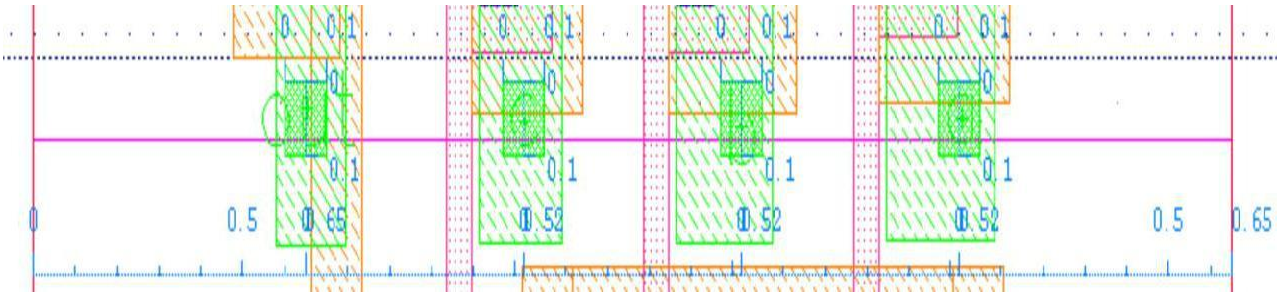


OAI 21 :

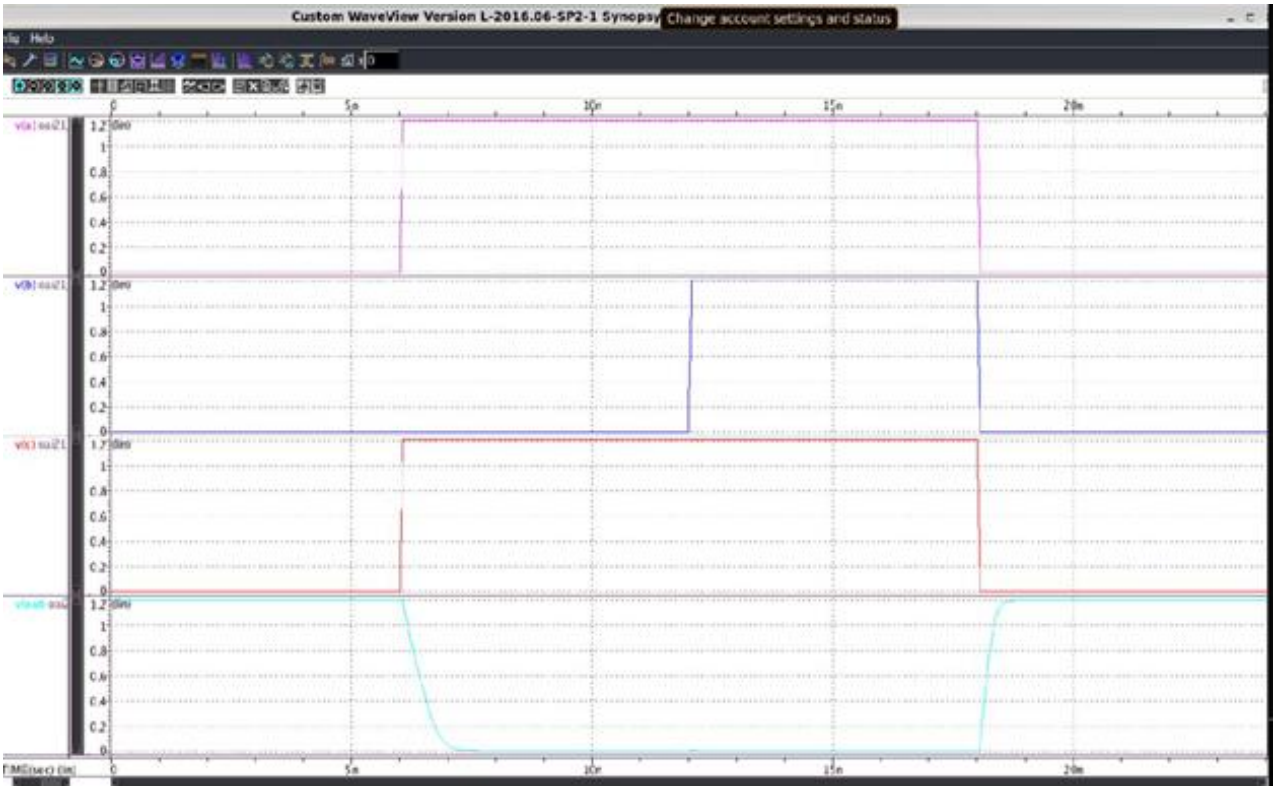
Layout view of OAI 21



Pin to pin distance of OAI 21

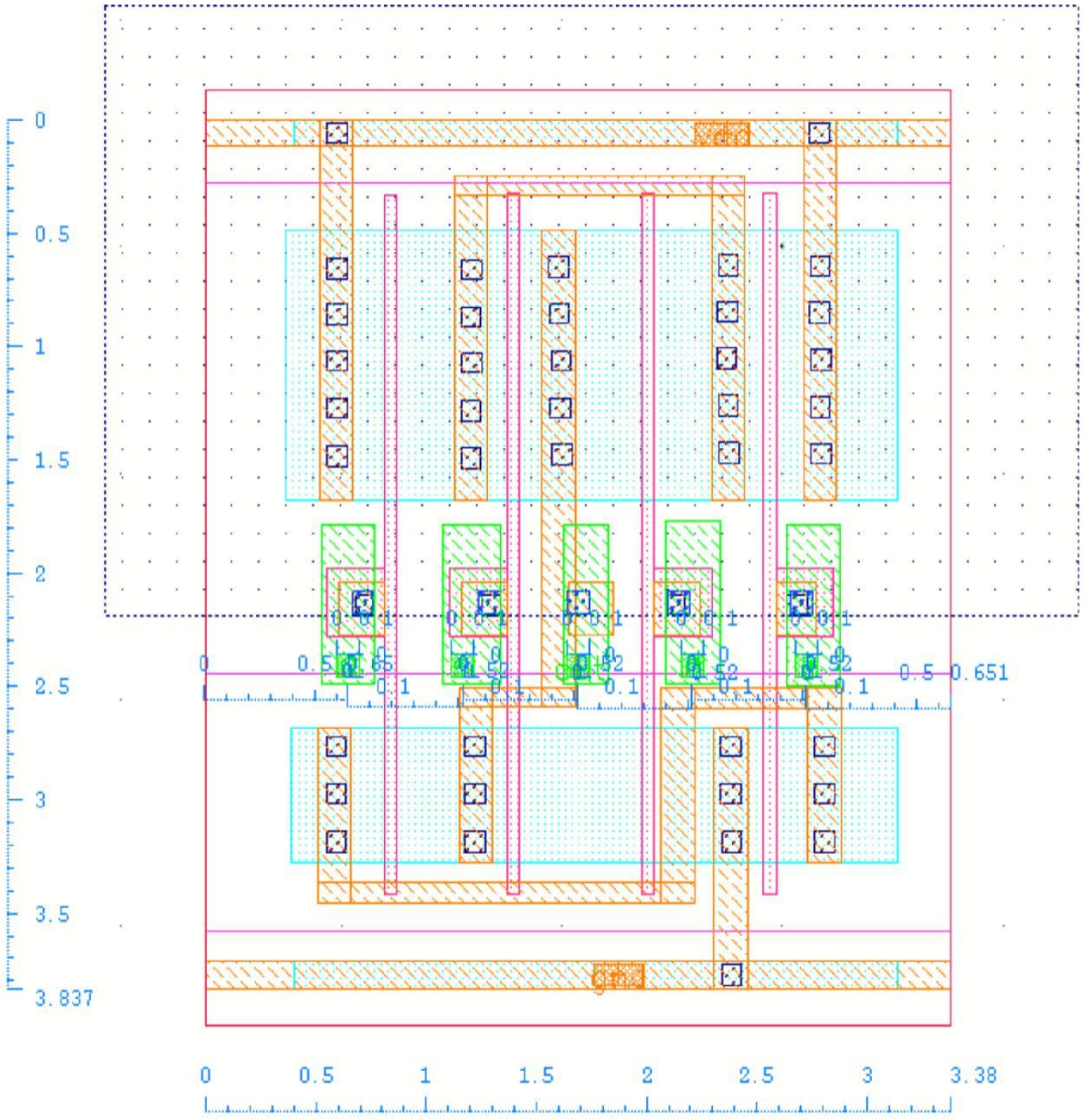


Waveform of OAI 21

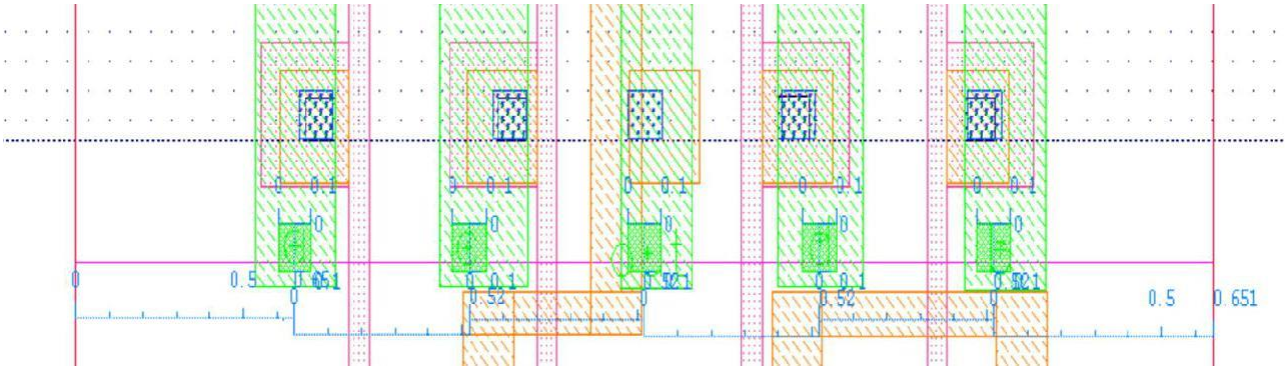


AOI 22 :

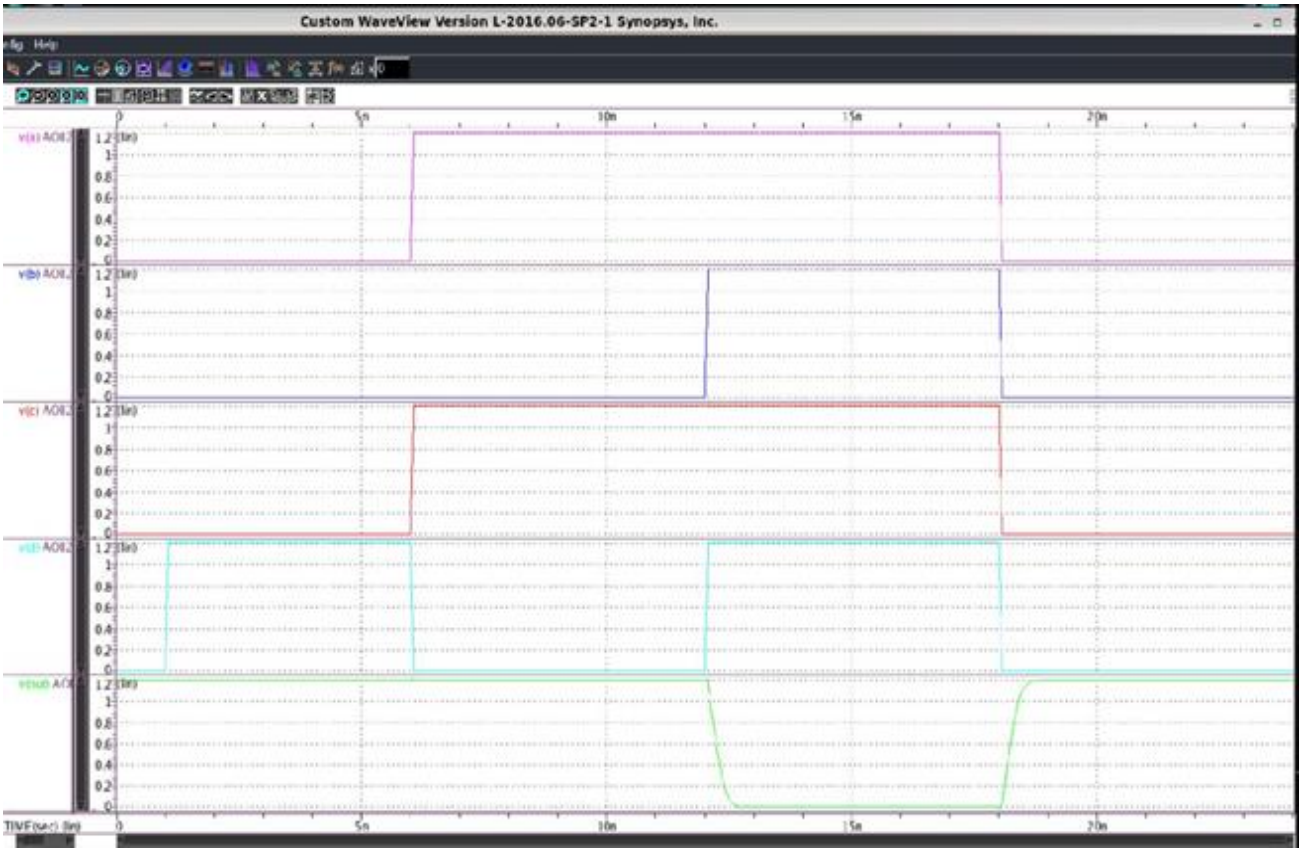
Layout view of AOI22



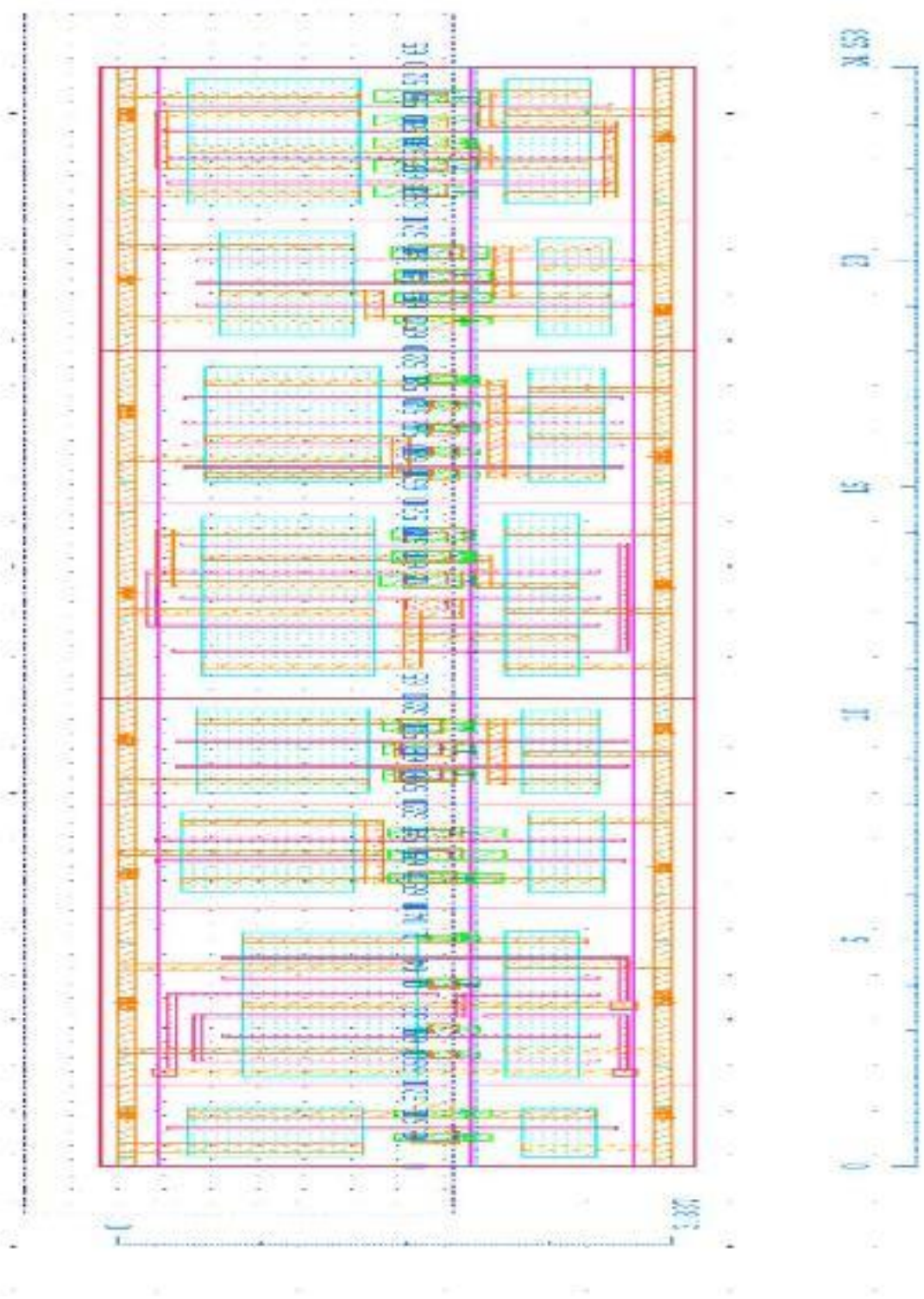
Pin to pin distance of AOI 22



Waveform of AOI 22



Standard Cells Placed Side by Side :



Conclusion :

We have completed the all the cell layouts and generated relevant simulation results. Also, pins are placed in such way that they have uniform pitch.