

AOI32 - Static Logic

Group Number : 30

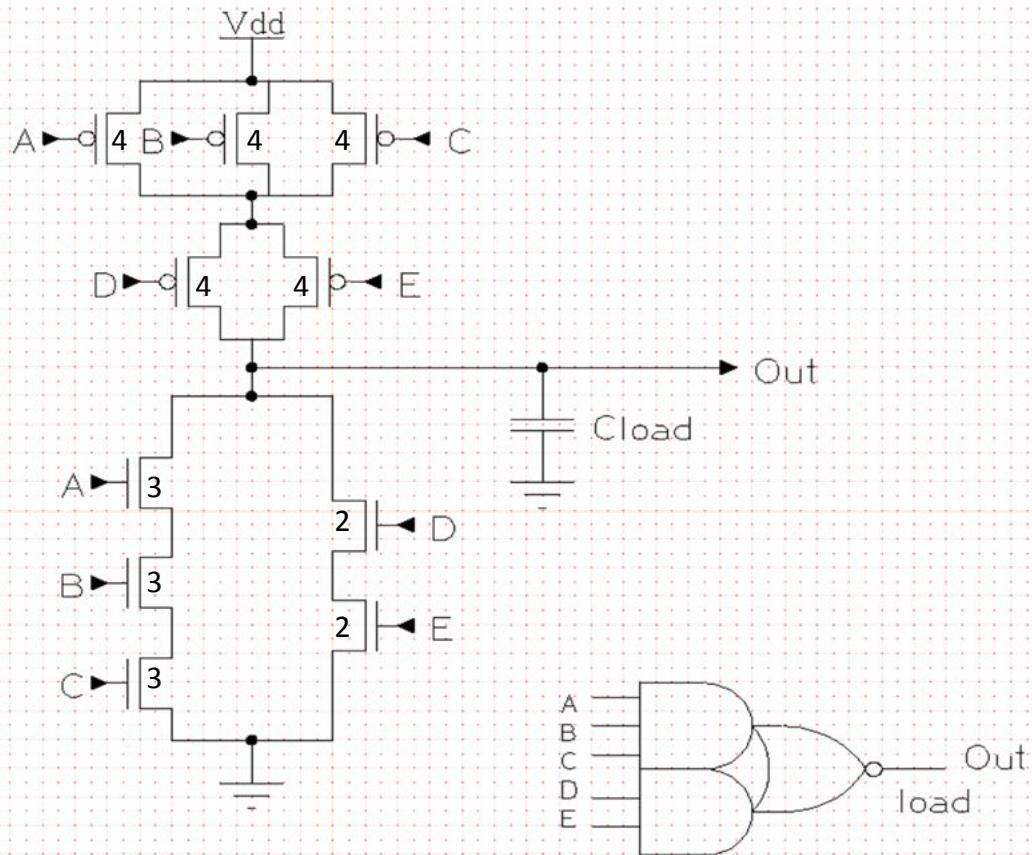


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Group Members :

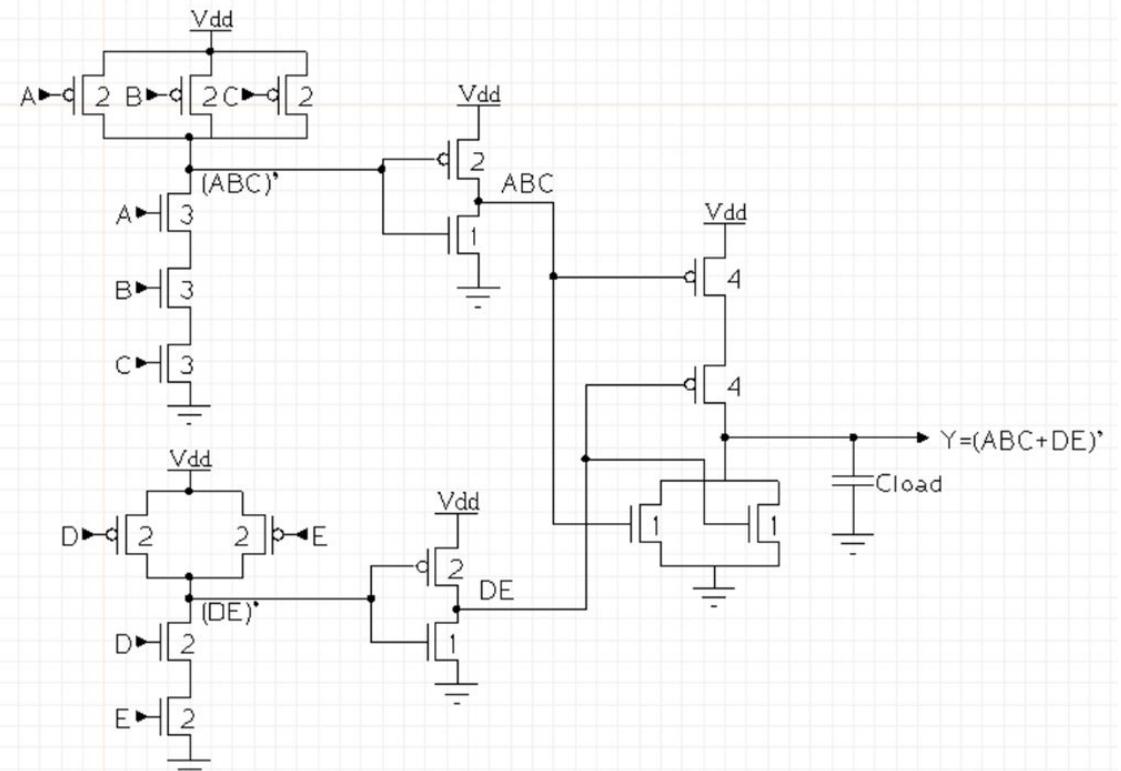
- | | |
|-------------------|-----------|
| 1.) Shivam Shukla | - 2022478 |
| 2.) Vaibhav Singh | - 2022555 |
| 3.) Satyam Pandey | - 2022463 |
| 4.) Sujal Dagur | - 2022512 |

Schematic + Sizing



Complex Schematic

$$OUT = \overline{(A \cdot B \cdot C) + (D \cdot E)}$$

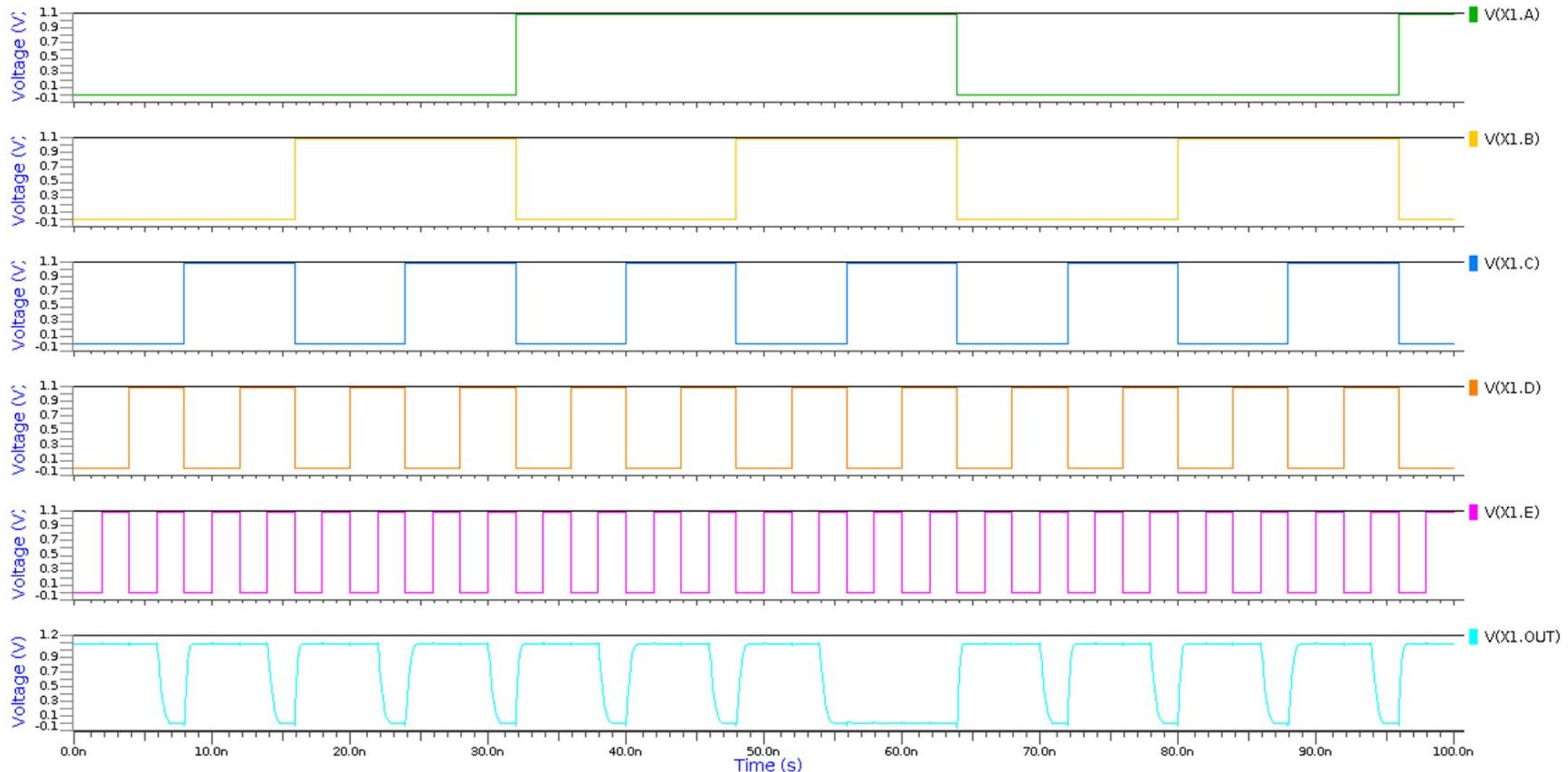


Non-Complex Schematic

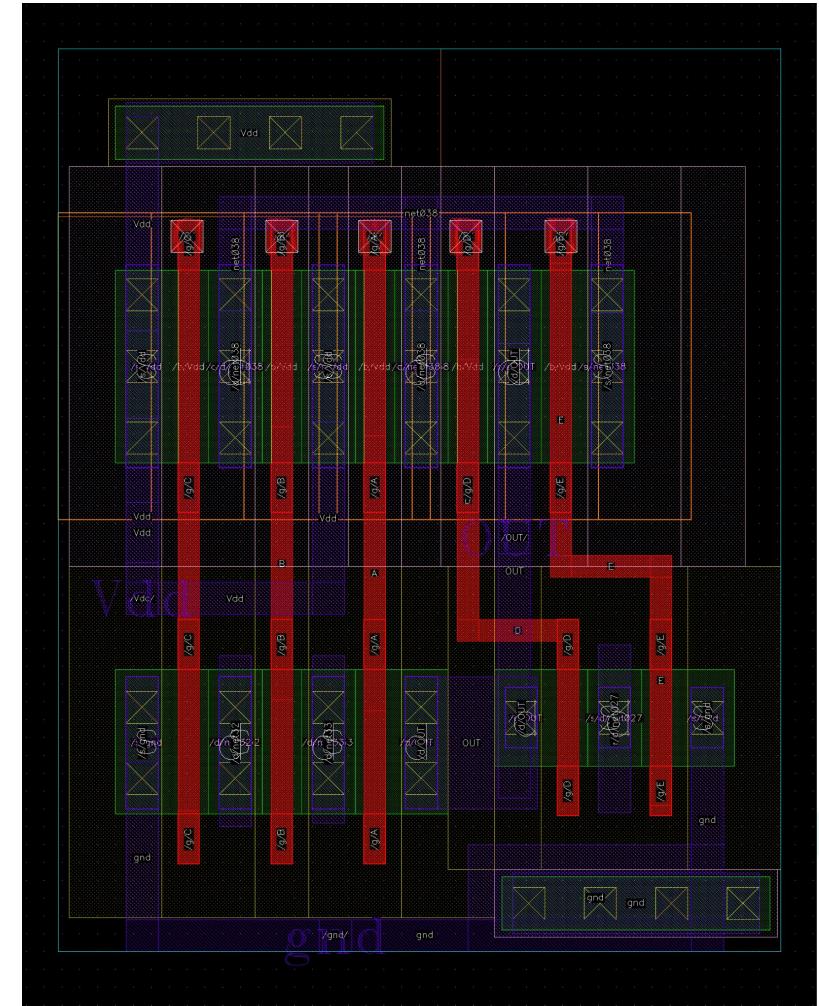
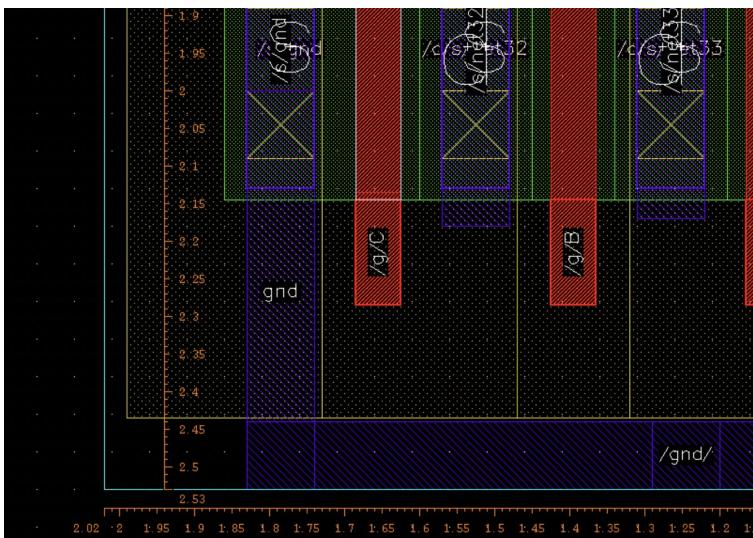
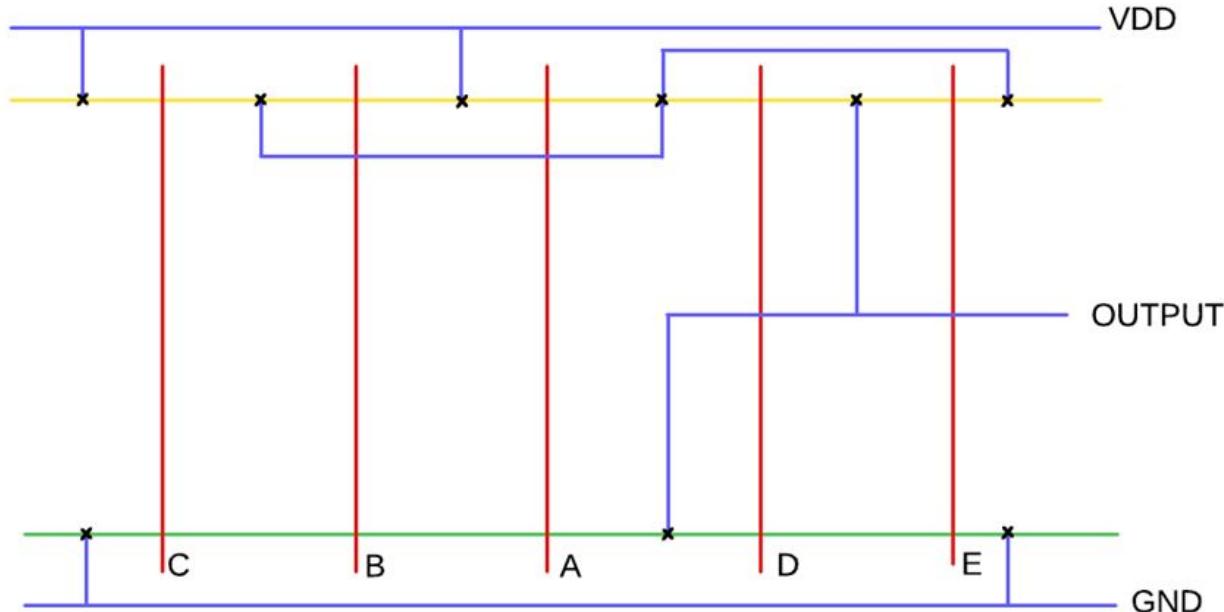
Sizing : $U = 0.135\text{um}$

1. $4U = 4 * 0.135 = 0.540\text{um}$
2. $3U = 3 * 0.135 = 0.405\text{um}$
3. $2U = 2 * 0.135 = 0.270\text{um}$

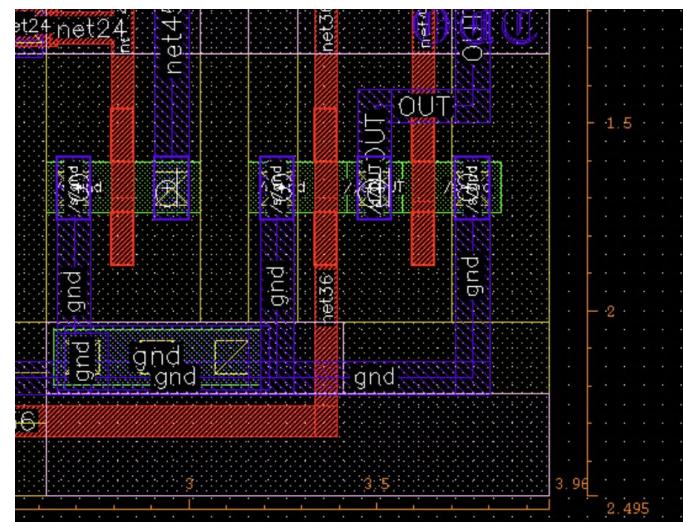
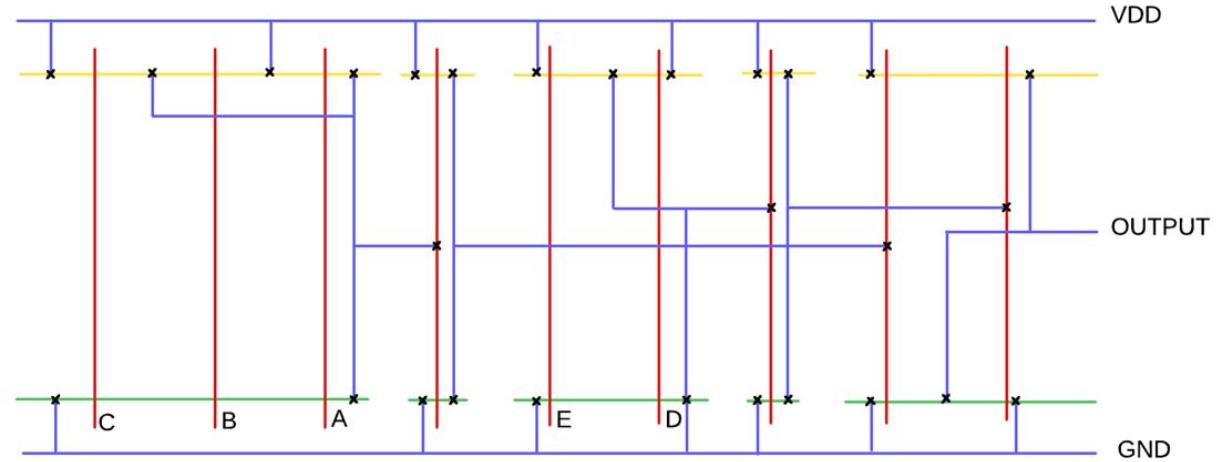
Output Waveform



Stick Diagram + Layout (Complex)



Stick Diagram + Layout (Non-Complex)

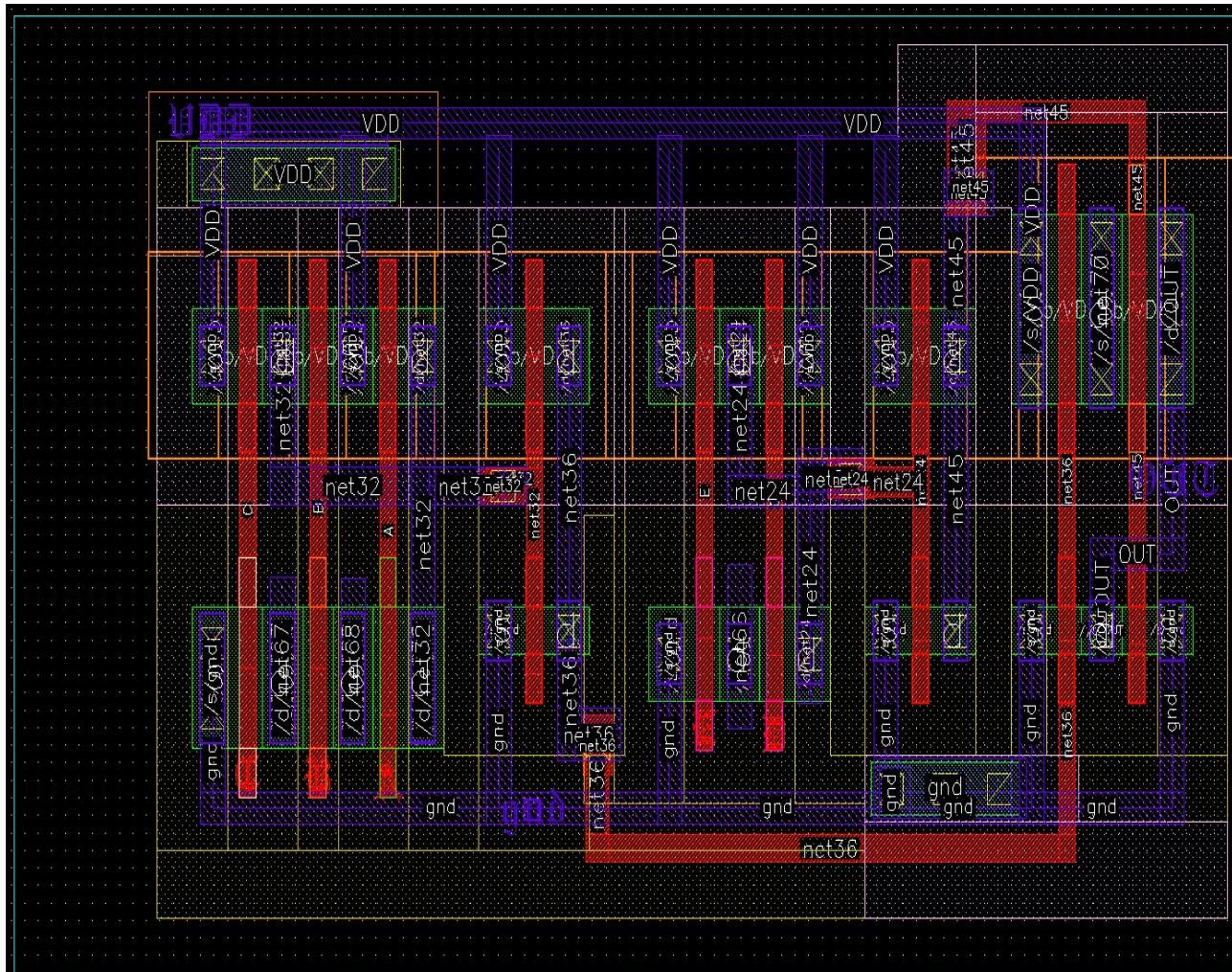


Cell Dimensions

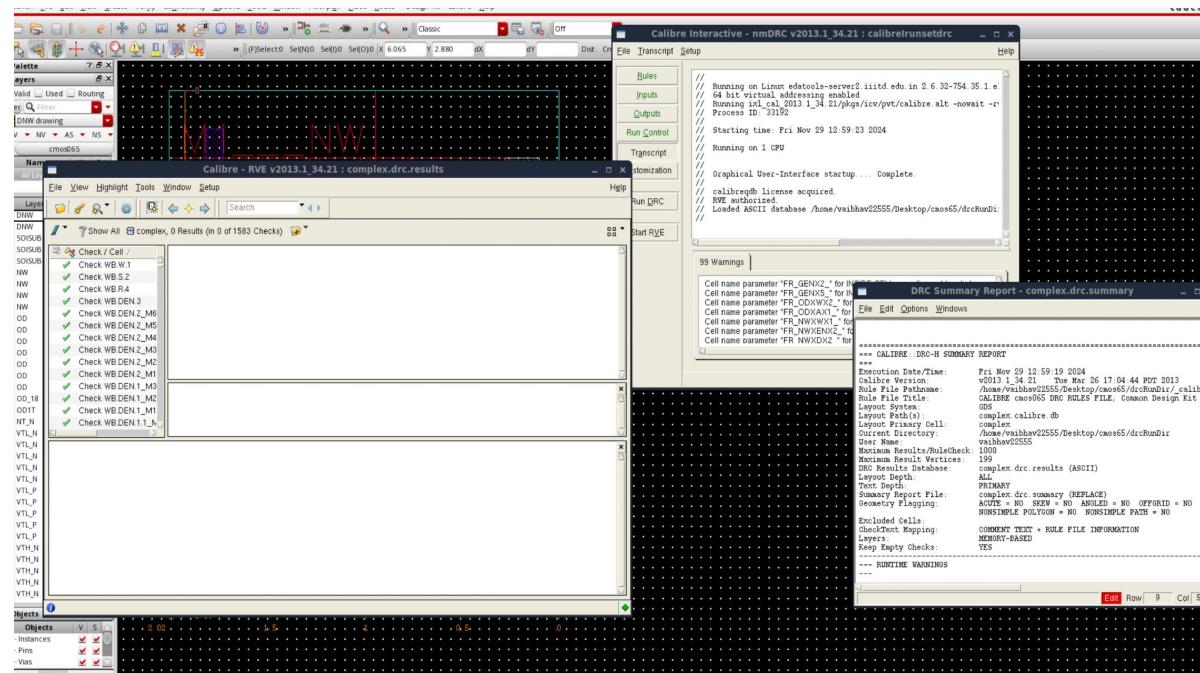
Area = $2.49\text{um} \times 3.96\text{um}$
= 9.8604 um^2

Length = 13 tracks

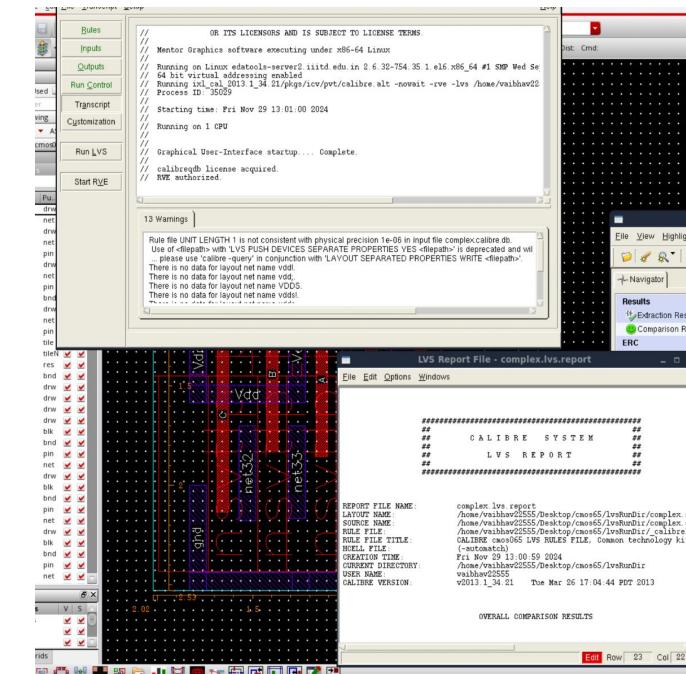
Breadth = 20 tracks



Verification (DRC+LVS) COMPLEX

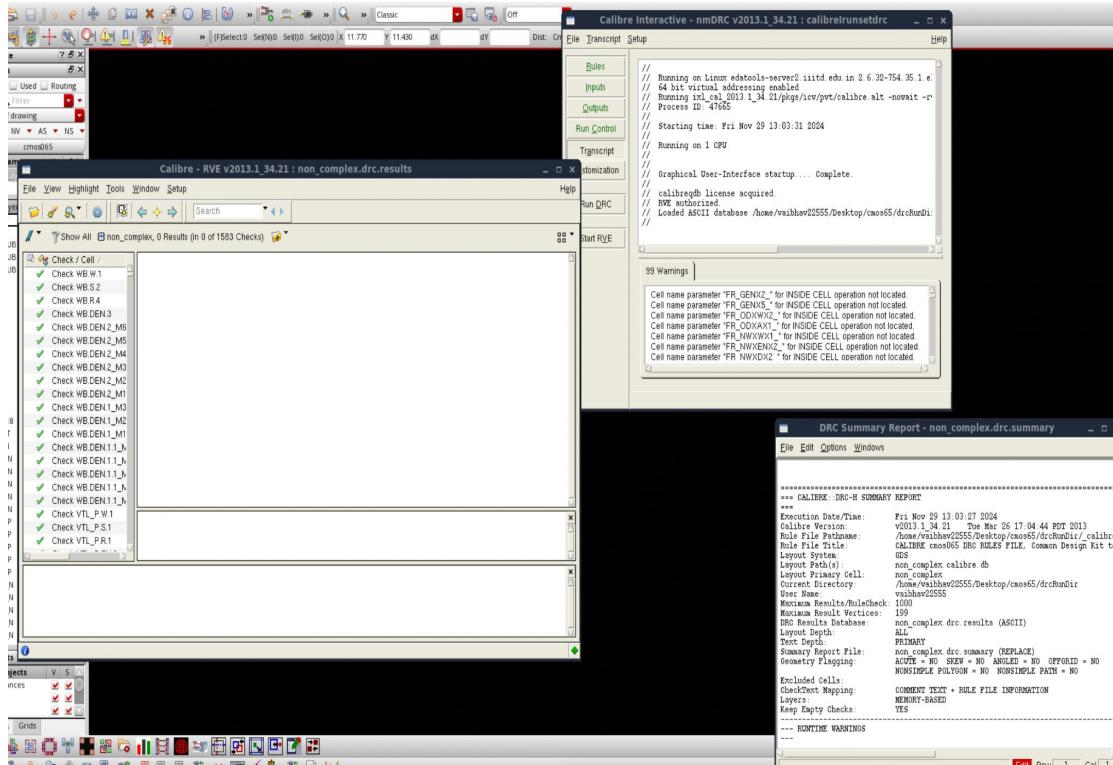


DRC Clean

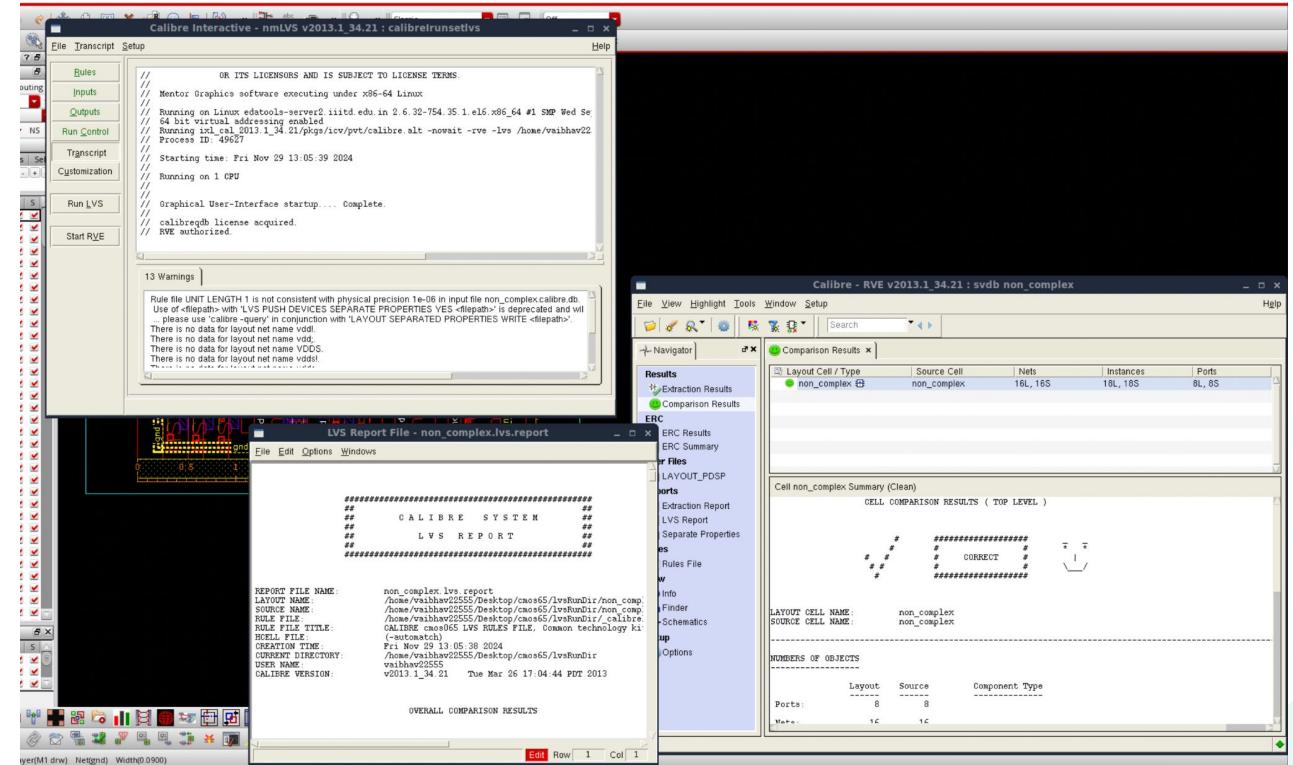


LVS Clean

Verification (DRC+LVS) NON COMPLEX



DRC Clean



LVS Clean

Stimuli For Verification & Verification Plan



PVT Conditions	
Best Case PVT	FF, 1.32V, -40C
Worst Case PVT	SS, 1.08V, 125C

Parameters	Rise Propagation Delay	Fall Propagation Delay	Rise Contamination Delay	Fall Contamination Delay
Input Stimulus	From: A=B=1,D=E=0 To: C (1 => 0)	From: A=B=D=E=0 To: C (0 => 1)	From: A=B=C=0 To: D (1=> 0), E (1=>0)	From: A=B=D=1 To: C (0 => 1),E(0=>1)

Pre and Post Layout Simulation Data



Condition	Parameters	Complex		Non-Complex	
		Pre-Layout	Post-Layout	Pre-Layout	Post-Layout
(SS, 1.08V, 125C)	Rise Propagation	253.03 ps	262.93 ps	357.42 ps	365.34 ps
	Fall Propagation	253.03 ps	266.34 ps	338.13 ps	350.23 ps
(FF, 1.32V, -40C)	Rise Contamination	48.458 ps	55.42 ps	111.46 ps	122.24 ps
	Fall Contamination	51.952 ps	54.24 ps	80.648 ps	91.67 ps
(TT, 1.2V, 25C)	Dynamic Power	0.994 μ W	1.427 μ W	2.89 μ W	3.49 μ W
	Static Power	3.73 μ W	5.468 μ W	8.45 μ W	11.23 μ W

Work Distribution



- Vaibhav Singh - **Layout(DRC LVS) + Parasitic Extraction**
- Shivam Shukla - **Schematic + Sizing + Stick Diagram + Waveform Analysis**
- Satyam Pandey - **Stick Diagram + Parasitic Extraction**
- Sujal Dagar - **Sizing + Parasitic Extraction**

