

ECEN 454

LAB 5

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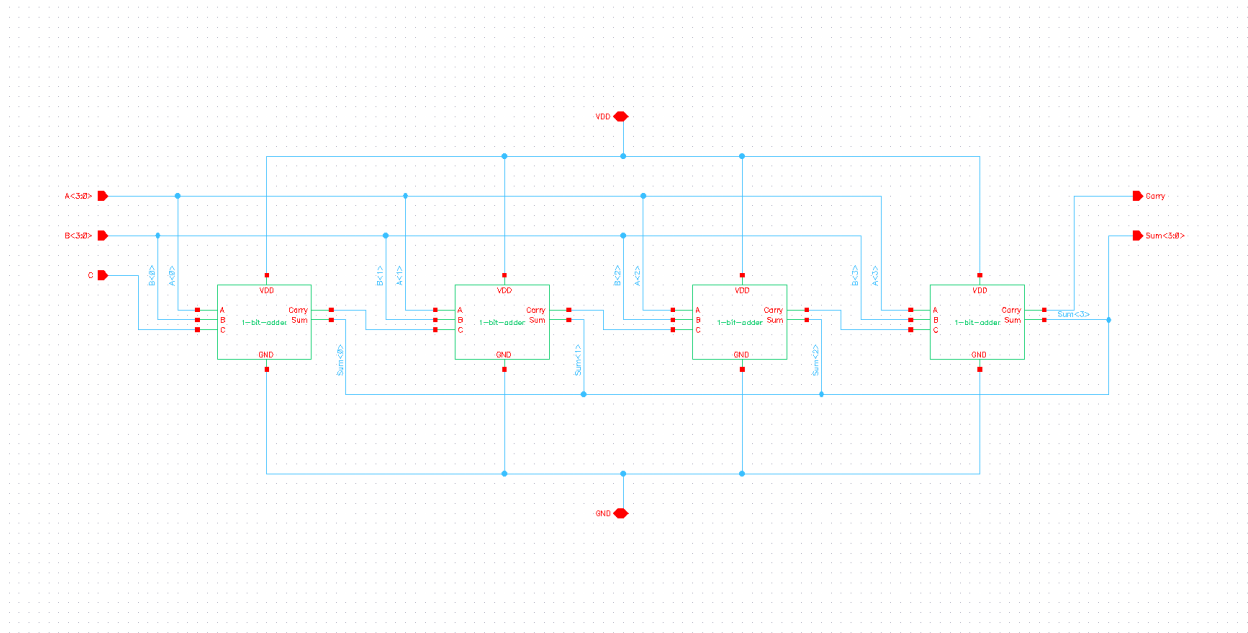
UIN: 126006979

SECTION: 511

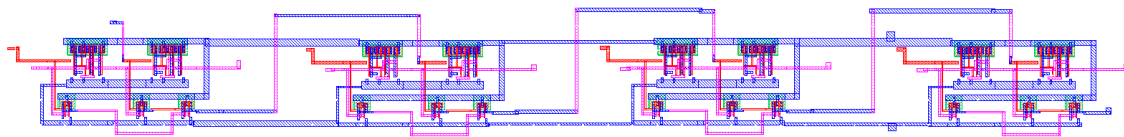
TA: Guaynu Gao

4-bit-adder

Schematic



Layout



LVS

```
@(#)SCDS: LVS version 6.1.8-64b 08/04/2020 19:19 (cpgsrv11) $

Command line: /opt/coe/cadence/IC618/tools.lnx86/dfil/bin/64bit/LVS -dir /home/ugrads/j/
Like matching is enabled.
Net swapping is enabled.
Using terminal names as correspondence points.
Compiling Diva LVS rules...

Net-list summary for /home/ugrads/j/jasongilman/ecen454/LVS/layout/netlist
count
91      nets
16      terminals
72      pmos
72      nmos

Net-list summary for /home/ugrads/j/jasongilman/ecen454/LVS/schematic/netlist
count
91      nets
16      terminals
72      pmos
72      nmos

Terminal correspondence points
N83     N12     A<0>
N80     N5      A<1>
N77     N14     A<2>
N75     N16     A<3>
N89     N11     B<0>
N86     N13     B<1>
N85     N15     B<2>
N84     N0      B<3>
N82     N8      C
N90     N1      Carry
N79     N6      GND
N81     N10     Sum<0>
N78     N9      Sum<1>
N76     N7      Sum<2>
N88     N4      Sum<3>
N87     N17     VDD

Devices in the rules but not in the netlist:
cap nfet pfet nmos4 pmos4

The net-lists match.
```

The net-lists match.

	layout	schematic
	instances	
un-matched	0	0
rewired	0	0
size errors	0	0
pruned	0	0
active	144	144
total	144	144
	nets	
un-matched	0	0
merged	0	0
pruned	0	0
active	91	91
total	91	91
	terminals	
un-matched	0	0
matched but		
different type	0	0
total	16	16

```
Probe files from /home/ugrads/j/jasongilman/ecen454/LVS/schematic

devbad.out:

netbad.out:

mergenet.out:

termbad.out:

prunenet.out:

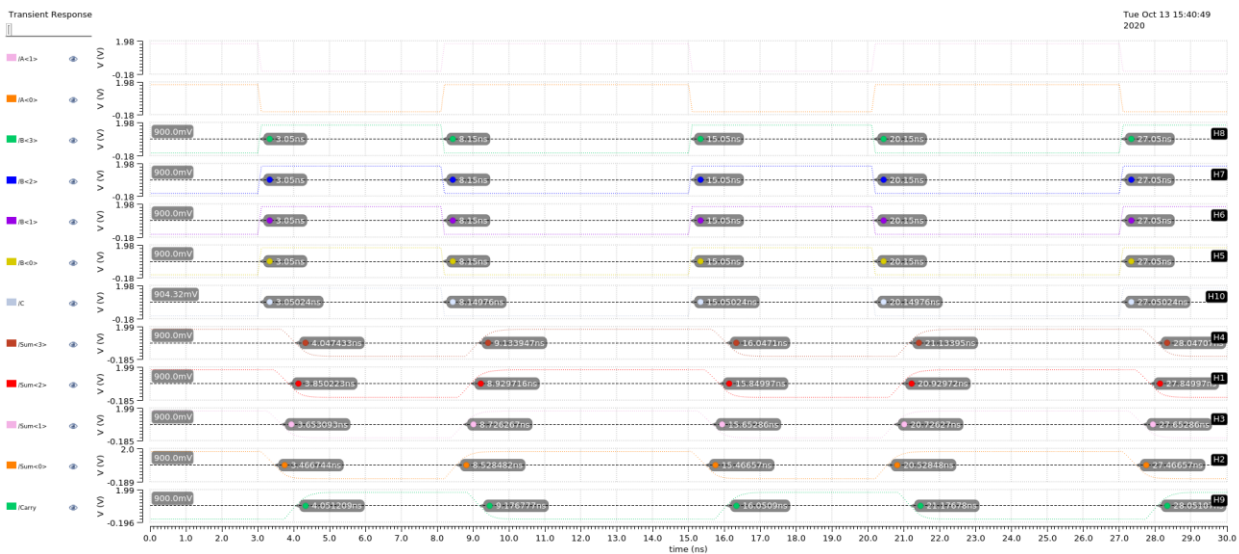
prunedev.out:

audit.out:
```

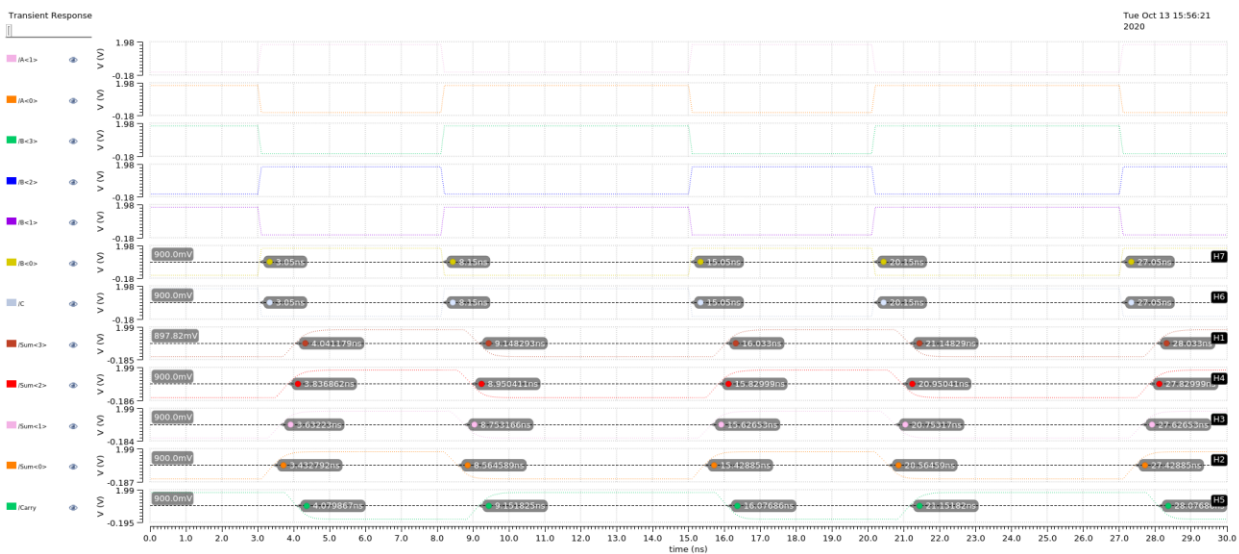
```
Probe files from /home/ugrads/j/jasongilman/ecen454/LVS/layout
```

Waveforms

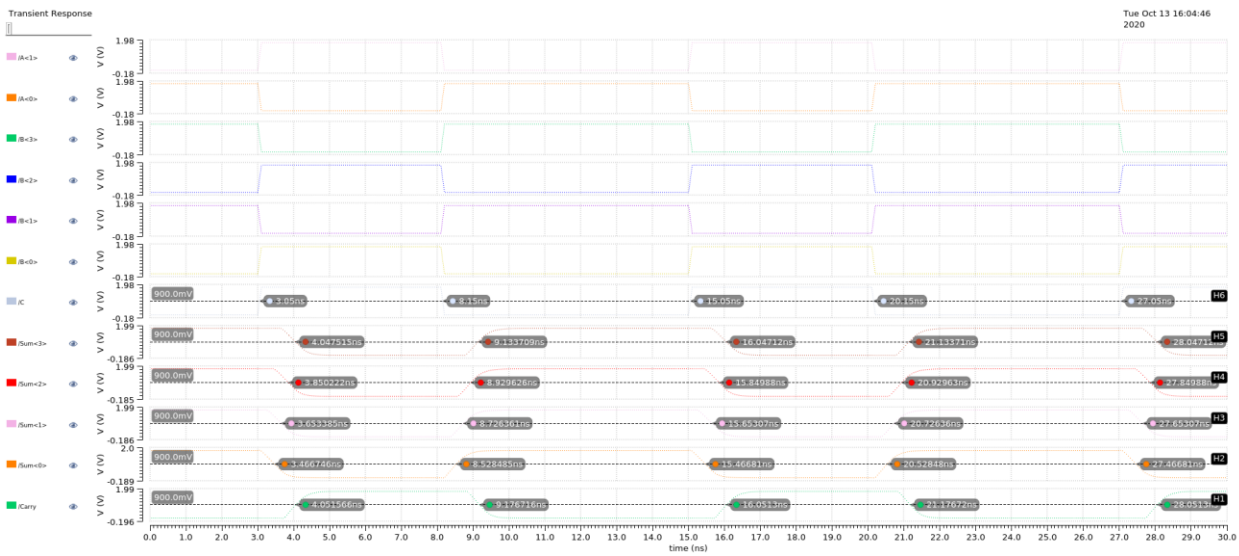
A=0000 B=1111 C=1



A=1010 B=0101 C=0



A=1010 B=0101 C=1



A=1100 B=1000 C=0



Delay

Input (A/B/C)	Sum<3> (ns)	Sum<2> (ns)	Sum<1> (ns)	Sum<0> (ns)	Carry (ns)
0000/1111/1	0.997433	0.800223	0.603093	0.416744	1.001209
1010/0101/0	0.991179	0.786862	0.58223	0.38279	1.02986
1010/0101/1	0.997515	0.800222	0.603385	0.416746	1.001566
1100/1000/0	0.819424	0.565779	0.609387	0.44322	0.42464

Power Consumption

Input (A/B/C)	Power Consumption (uW)
0000/1111/1	18.33
1010/0101/0	39.56
1010/0101/1	18.87
1100/1000/0	17.52