

VLSI PROJECT

Roll no. 2022102047

V.V.S.R CHETAN KRISHNA

DELAY ANALYSIS

ADDER DELAYS:

SET THE REQUIRED INPUT AS PULSE AND REST ALL

DC=0. A0 VS S0 :

```
Measurements for Transient Analysis
trise1      = 1.428818e-09 targ= 1.478818e-09 trig= 5.000000e-11
tfall1      = 1.003990e-09 targ= 2.011540e-07 trig= 2.001500e-07
tpd1        = 1.21640e-09
```

B0 VS S0:

```
Measurements for Transient Analysis
trise1      = 1.899663e-09 targ= 1.949663e-09 trig= 5.000000e-11
tfall1      = 1.185044e-09 targ= 2.013350e-07 trig= 2.001500e-07
tpd1        = 1.54235e-09
```

A1 VS S1:

```
Measurements for Transient Analysis
trise1      = 1.432543e-09 targ= 1.482543e-09 trig= 5.000000e-11
tfall1      = 9.979176e-10 targ= 2.011479e-07 trig= 2.001500e-07
tpd1        = 1.21523e-09
```

B1 VS S1:

```
Measurements for Transient Analysis
trise1      = 1.958620e-09 targ= 2.008620e-09 trig= 5.000000e-11
tfall1      = 1.215933e-09 targ= 2.013659e-07 trig= 2.001500e-07
tpd1        = 1.58728e-09
```

A2 VS S2:

Measurements for Transient Analysis					
trise1	=	1.403797e-09	targ=	1.453797e-09	trig= 5.000000e-11
tfall1	=	1.033774e-09	targ=	2.011838e-07	trig= 2.001500e-07
tpd1	=	1.21879e-09			

B2 VS S2:

Measurements for Transient Analysis					
trise1	=	2.019543e-09	targ=	2.069543e-09	trig= 5.000000e-11
tfall1	=	1.267025e-09	targ=	2.014170e-07	trig= 2.001500e-07
tpd1	=	1.64328e-09			

A3 VS S3:

Measurements for Transient Analysis					
trise1	=	1.674680e-09	targ=	1.724680e-09	trig= 5.000000e-11
tfall1	=	1.147476e-09	targ=	2.012975e-07	trig= 2.001500e-07
tpd1	=	1.41108e-09			

B3 VS S3:

Measurements for Transient Analysis					
trise1	=	2.101218e-09	targ=	2.151218e-09	trig= 5.000000e-11
tfall1	=	1.290119e-09	targ=	2.014401e-07	trig= 2.001500e-07
tpd1	=	1.69567e-09			

A0 VS S1 :

Measurements for Transient Analysis					
trise1	=	1.514462e-09	targ=	1.564462e-09	trig= 5.000000e-11
tfall1	=	1.359911e-09	targ=	2.015099e-07	trig= 2.001500e-07
tpd1	=	1.43719e-09			

A0 VS S2 :

Measurements for Transient Analysis					
trise1	=	2.185185e-09	targ=	2.235185e-09	trig= 5.000000e-11
tfall1	=	1.994881e-09	targ=	2.021449e-07	trig= 2.001500e-07
tpd1	=	2.09003e-09			

A0 VS S3:

Measurements for Transient Analysis					
trise1	=	2.811372e-09	targ=	2.861372e-09	trig= 5.000000e-11
tfall1	=	2.611482e-09	targ=	2.027615e-07	trig= 2.001500e-07
tpd1	=	2.71143e-09			

A1 VS S2 :

Measurements for Transient Analysis					
trisel	=	1.469422e-09	targ=	1.519422e-09	trig= 5.000000e-11
tfall1	=	1.377822e-09	targ=	2.015278e-07	trig= 2.001500e-07
tpd1	=	1.42362e-09			

A1 VS S3:

Measurements for Transient Analysis					
trisel	=	2.107952e-09	targ=	2.157952e-09	trig= 5.000000e-11
tfall1	=	1.990894e-09	targ=	2.021409e-07	trig= 2.001500e-07
tpd1	=	2.04942e-09			

A2 VS S3:

Measurements for Transient Analysis					
trisel	=	1.474578e-09	targ=	1.524578e-09	trig= 5.000000e-11
tfall1	=	1.413247e-09	targ=	2.015632e-07	trig= 2.001500e-07
tpd1	=	1.44391e-09			

B0 VS S1:

Measurements for Transient Analysis					
trisel	=	2.129628e-09	targ=	2.179628e-09	trig= 5.000000e-11
tfall1	=	1.632457e-09	targ=	2.017825e-07	trig= 2.001500e-07
tpd1	=	1.88104e-09			

B0 VS S2:

Measurements for Transient Analysis					
trisel	=	2.808925e-09	targ=	2.858925e-09	trig= 5.000000e-11
tfall1	=	2.286933e-09	targ=	2.024369e-07	trig= 2.001500e-07
tpd1	=	2.54793e-09			

B0 VS S3:

Measurements for Transient Analysis					
trisel	=	3.497155e-09	targ=	3.547155e-09	trig= 5.000000e-11
tfall1	=	2.895356e-09	targ=	2.030454e-07	trig= 2.001500e-07
tpd1	=	3.19626e-09			

B1 VS S2:

Measurements for Transient Analysis					
trisel	=	2.208063e-09	targ=	2.258063e-09	trig= 5.000000e-11
tfall1	=	1.652224e-09	targ=	2.018022e-07	trig= 2.001500e-07
tpd1	=	1.93014e-09			

B1 VS S3:

Measurements for Transient Analysis

trisel	=	2.904697e-09	targ=	2.954697e-09	trig=	5.000000e-11
tfall1	=	2.294638e-09	targ=	2.024446e-07	trig=	2.001500e-07
tpd1	=	2.59967e-09				

B2 VS S3:

Measurements for Transient Analysis

trisel	=	2.165666e-09	targ=	2.215666e-09	trig=	5.000000e-11
tfall1	=	1.653076e-09	targ=	2.018031e-07	trig=	2.001500e-07
tpd1	=	1.90937e-09				

CRITICAL PATH : (MAX DELAY):

Measurements for Transient Analysis

trisel	=	3.497155e-09	targ=	3.547155e-09	trig=	5.000000e-11
tfall1	=	2.895356e-09	targ=	2.030454e-07	trig=	2.001500e-07
tpd1	=	3.19626e-09				

SUBTRACTION DELAYS

A0 VS S0 :

Measurements for Transient Analysis

trisel	=	1.036408e-09	targ=	1.086408e-09	trig=	5.000000e-11
tfall1	=	1.206230e-09	targ=	2.013562e-07	trig=	2.001500e-07
tpd1	=	1.12132e-09				

A1 VS S1:

Measurements for Transient Analysis

trisel	=	1.040807e-09	targ=	1.090807e-09	trig=	5.000000e-11
tfall1	=	1.210267e-09	targ=	2.013603e-07	trig=	2.001500e-07
tpd1	=	1.12554e-09				

A2 VS S2:

Measurements for Transient Analysis

trisel	=	1.101597e-09	targ=	1.151597e-09	trig=	5.000000e-11
tfall1	=	1.200815e-09	targ=	2.013508e-07	trig=	2.001500e-07
tpd1	=	1.15121e-09				

A3 VS S3:

Measurements for Transient Analysis

trisel	=	1.130888e-09	targ=	1.180888e-09	trig=	5.000000e-11
tfall1	=	1.242275e-09	targ=	2.013923e-07	trig=	2.001500e-07
tpd1	=	1.18658e-09				

B0 VS S0:

Measurements for Transient Analysis

trisel	=	2.017101e-07	targ=	2.017601e-07	trig=	5.000000e-11
tfall1	=	-1.985840e-07	targ=	1.566012e-09	trig=	2.001500e-07
tpd1	=	1.56306e-09				

B1 VS S1:

Measurements for Transient Analysis

trisel	=	2.018343e-07	targ=	2.018843e-07	trig=	5.000000e-11
tfall1	=	-1.984936e-07	targ=	1.656425e-09	trig=	2.001500e-07
tpd1	=	1.67039e-09				

B2 VS S2:

Measurements for Transient Analysis

trisel	=	2.019641e-07	targ=	2.020141e-07	trig=	5.000000e-11
tfall1	=	-1.983270e-07	targ=	1.822976e-09	trig=	2.001500e-07
tpd1	=	1.81854e-09				

B3 VS S3:

Measurements for Transient Analysis

trisel	=	2.021385e-07	targ=	2.021885e-07	trig=	5.000000e-11
tfall1	=	-1.982147e-07	targ=	1.935264e-09	trig=	2.001500e-07
tpd1	=	1.96188e-09				

A0 VS S1:

Measurements for Transient Analysis

trisel	=	2.019546e-07	targ=	2.020046e-07	trig=	5.000000e-11
tfall1	=	-1.982299e-07	targ=	1.920100e-09	trig=	2.001500e-07
tpd1	=	1.86237e-09				

A0 VS S2:

Measurements for Transient Analysis

trisel	=	2.756173e-09	targ=	2.806173e-09	trig=	5.000000e-11
tfall1	=	2.433584e-09	targ=	2.025836e-07	trig=	2.001500e-07
tpd1	=	2.59488e-09				

A0 VS S3:

Measurements for Transient Analysis

trisel	=	3.425801e-09	targ=	3.475801e-09	trig=	5.000000e-11
tfall1	=	3.075383e-09	targ=	2.032254e-07	trig=	2.001500e-07
tpd1	=	3.25059e-09				

A1 VS S2:

Measurements for Transient Analysis

trisel	=	2.071869e-09	targ=	2.121869e-09	trig=	5.000000e-11
tfall1	=	1.755573e-09	targ=	2.019056e-07	trig=	2.001500e-07
tpd1	=	1.91372e-09				

A1 VS S3:

Measurements for Transient Analysis

trisel	=	2.712607e-09	targ=	2.762607e-09	trig=	5.000000e-11
tfall1	=	2.394570e-09	targ=	2.025446e-07	trig=	2.001500e-07
tpd1	=	2.55359e-09				

A2 VS S3:

Measurements for Transient Analysis

trisel	=	2.121687e-09	targ=	2.171687e-09	trig=	5.000000e-11
tfall1	=	1.806641e-09	targ=	2.019566e-07	trig=	2.001500e-07
tpd1	=	1.96416e-09				

B0 VS S1:

Measurements for Transient Analysis

trisel	=	2.116856e-09	targ=	2.166856e-09	trig=	5.000000e-11
tfall1	=	2.339844e-09	targ=	2.024898e-07	trig=	2.001500e-07
tpd1	=	2.22835e-09				

B0 VS S2:

Measurements for Transient Analysis

trisel	=	2.745820e-09	targ=	2.795820e-09	trig=	5.000000e-11
tfall1	=	2.973995e-09	targ=	2.031240e-07	trig=	2.001500e-07
tpd1	=	2.85991e-09				

B0 VS S3:

Measurements for Transient Analysis

trisel	=	2.039923e-07	targ=	2.040423e-07	trig=	5.000000e-11
tfall1	=	-1.967759e-07	targ=	3.374110e-09	trig=	2.001500e-07
tpd1	=	3.60818e-09				

B1 VS S2:

Measurements for Transient Analysis

trisel	=	2.142211e-09	targ=	2.192211e-09	trig=	5.000000e-11
tfall1	=	2.406353e-09	targ=	2.025564e-07	trig=	2.001500e-07
tpd1	=	2.27428e-09				

B1 VS S3:

Measurements for Transient Analysis

trisel	=	2.033742e-07	targ=	2.034242e-07	trig=	5.000000e-11
tfall1	=	-1.973901e-07	targ=	2.759864e-09	trig=	2.001500e-07
tpd1	=	2.99203e-09				

B2 VS S3:

Measurements for Transient Analysis

trisel	=	2.029281e-07	targ=	2.029781e-07	trig=	5.000000e-11
tfall1	=	-1.978281e-07	targ=	2.321884e-09	trig=	2.001500e-07
tpd1	=	2.54999e-09				

CRITICAL PATH: (MAX DELAY):

Measurements for Transient Analysis

trisel	=	2.039923e-07	targ=	2.040423e-07	trig=	5.000000e-11
tfall1	=	-1.967759e-07	targ=	3.374110e-09	trig=	2.001500e-07
tpd1	=	3.60818e-09				

COMPARATOR DELAYS:

LESSER DELAYS:

A0 vs C3:

Measurements for Transient Analysis

trisel	=	2.458773e-09	targ=	2.508773e-09	trig=	5.000000e-11
tfall1	=	1.944208e-09	targ=	2.020942e-07	trig=	2.001500e-07
tpd1	=	2.20149e-09				

A1 VS C3:

Measurements for Transient Analysis

trisel	=	2.730291e-09	targ=	2.780291e-09	trig=	5.000000e-11
tfall1	=	2.028524e-09	targ=	2.021785e-07	trig=	2.001500e-07
tpd1	=	2.37941e-09				

A2 VS C3 :

Measurements for Transient Analysis

trisel	=	2.633064e-09	targ=	2.683064e-09	trig=	5.000000e-11
tfall1	=	1.965589e-09	targ=	2.021156e-07	trig=	2.001500e-07
tpd1	=	2.29933e-09				

A3 VS C3:

Measurements for Transient Analysis					
trisel	=	2.342931e-09	targ=	2.392931e-09	trig= 5.000000e-11
tfall1	=	1.422136e-09	targ=	2.015721e-07	trig= 2.001500e-07
tpd1	=	1.88253e-09			

B0 VS C3 :

Measurements for Transient Analysis					
trisel	=	2.019061e-07	targ=	2.019561e-07	trig= 5.000000e-11
tfall1	=	-1.981385e-07	targ=	2.011465e-09	trig= 2.001500e-07
tpd1	=	1.88379e-09			

B1 VS C3:

Measurements for Transient Analysis					
trisel	=	2.022178e-07	targ=	2.022678e-07	trig= 5.000000e-11
tfall1	=	-1.979570e-07	targ=	2.192972e-09	trig= 2.001500e-07
tpd1	=	2.13040e-09			

B2 VS C3 :

Measurements for Transient Analysis					
trisel	=	2.023366e-07	targ=	2.023866e-07	trig= 5.000000e-11
tfall1	=	-1.980500e-07	targ=	2.100028e-09	trig= 2.001500e-07
tpd1	=	2.14329e-09			

B3 VS C3:

Measurements for Transient Analysis					
trisel	=	2.021064e-07	targ=	2.021564e-07	trig= 5.000000e-11
tfall1	=	-1.987462e-07	targ=	1.403754e-09	trig= 2.001500e-07
tpd1	=	1.68009e-09			

EQUAL DELAYS

A0 VS C2:

Measurements for Transient Analysis					
trisel	=	1.904116e-09	targ=	1.954116e-09	trig= 5.000000e-11
tfall1	=	1.869650e-09	targ=	2.020197e-07	trig= 2.001500e-07
tpd1	=	1.88688e-09			

A1 VS C2:

Measurements for Transient Analysis					
trisel	=	2.363849e-09	targ=	2.413849e-09	trig= 5.000000e-11
tfall1	=	2.854944e-09	targ=	2.030049e-07	trig= 2.001500e-07
tpd1	=	2.60940e-09			

A2 VS C2:

Measurements for Transient Analysis

trise1	=	2.365385e-09	targ=	2.415385e-09	trig=	5.000000e-11
tfall1	=	3.462232e-09	targ=	2.036122e-07	trig=	2.001500e-07
tpd1	=	2.91381e-09				

A3 VS C2 :

Measurements for Transient Analysis

trise1	=	2.262452e-09	targ=	2.312452e-09	trig=	5.000000e-11
tfall1	=	3.687912e-09	targ=	2.038379e-07	trig=	2.001500e-07
tpd1	=	2.97518e-09				

B0 VS C2:

Measurements for Transient Analysis

trise1	=	1.752824e-09	targ=	1.802824e-09	trig=	5.000000e-11
tfall1	=	1.716627e-09	targ=	2.018666e-07	trig=	2.001500e-07
tpd1	=	1.73473e-09				

B1 VS C2:

Measurements for Transient Analysis

trise1	=	2.279988e-09	targ=	2.329988e-09	trig=	5.000000e-11
tfall1	=	2.560371e-09	targ=	2.027104e-07	trig=	2.001500e-07
tpd1	=	2.42018e-09				

B2 VS C2 :

Measurements for Transient Analysis

trise1	=	2.395052e-09	targ=	2.445052e-09	trig=	5.000000e-11
tfall1	=	3.099039e-09	targ=	2.032490e-07	trig=	2.001500e-07
tpd1	=	2.74705e-09				

B3 VS C2:

Measurements for Transient Analysis

trise1	=	2.208064e-09	targ=	2.258064e-09	trig=	5.000000e-11
tfall1	=	3.269721e-09	targ=	2.034197e-07	trig=	2.001500e-07
tpd1	=	2.73889e-09				

GREATER DELAYS

A0 VS C1:

Measurements for Transient Analysis

trise1	=	2.019151e-07	targ=	2.019651e-07	trig=	5.000000e-11
tfall1	=	-1.980829e-07	targ=	2.067130e-09	trig=	2.001500e-07
tpd1	=	1.91609e-09				

A1 VS C1:

Measurements for Transient Analysis

trise1	=	2.021697e-07	targ=	2.022197e-07	trig=	5.000000e-11
tfall1	=	-1.979530e-07	targ=	2.196957e-09	trig=	2.001500e-07
tpd1	=	2.10833e-09				

A2 VS C1:

Measurements for Transient Analysis

trise1	=	2.023859e-07	targ=	2.024359e-07	trig=	5.000000e-11
tfall1	=	-1.982672e-07	targ=	1.882835e-09	trig=	2.001500e-07
tpd1	=	2.05936e-09				

A3 VS C1:

Measurements for Transient Analysis

trise1	=	2.021104e-07	targ=	2.021604e-07	trig=	5.000000e-11
tfall1	=	-1.987713e-07	targ=	1.378722e-09	trig=	2.001500e-07
tpd1	=	1.66957e-09				

B0 VS C1 :

Measurements for Transient Analysis

trise1	=	2.438753e-09	targ=	2.488753e-09	trig=	5.000000e-11
tfall1	=	1.969273e-09	targ=	2.021193e-07	trig=	2.001500e-07
tpd1	=	2.20401e-09				

B1 VS C1:

Measurements for Transient Analysis

trise1	=	2.690640e-09	targ=	2.740640e-09	trig=	5.000000e-11
tfall1	=	2.032591e-09	targ=	2.021826e-07	trig=	2.001500e-07
tpd1	=	2.36162e-09				

B2 VS C1:

Measurements for Transient Analysis

trise1	=	2.737497e-09	targ=	2.787497e-09	trig=	5.000000e-11
tfall1	=	1.967900e-09	targ=	2.021179e-07	trig=	2.001500e-07
tpd1	=	2.35270e-09				

B3 VS C1:

Measurements for Transient Analysis

trise1	=	2.307239e-09	targ=	2.357239e-09	trig=	5.000000e-11
tfall1	=	1.480695e-09	targ=	2.016307e-07	trig=	2.001500e-07
tpd1	=	1.89397e-09				

CRITICAL PATH: (MAX DELAY):

Measurements for Transient Analysis

trise1	=	2.262452e-09	targ=	2.312452e-09	trig=	5.000000e-11
tfall1	=	3.687912e-09	targ=	2.038379e-07	trig=	2.001500e-07
tpd1	=	2.97518e-09				

AND DELAYS:

Here we obtain 8 delays, and

they are A0 vs R0:

Measurements for Transient Analysis

trise1	=	5.564904e-10	targ=	6.064904e-10	trig=	5.000000e-11
tfall1	=	6.782832e-10	targ=	2.008283e-07	trig=	2.001500e-07
tpd1	=	6.17387e-10				

B0 VS R0:

Measurements for Transient Analysis

trise1	=	5.459937e-10	targ=	5.959937e-10	trig=	5.000000e-11
tfall1	=	6.026950e-10	targ=	2.007527e-07	trig=	2.001500e-07
tpd1	=	5.74344e-10				

A1 VS R1:

Measurements for Transient Analysis

trise1	=	5.629671e-10	targ=	6.129671e-10	trig=	5.000000e-11
tfall1	=	6.819627e-10	targ=	2.008320e-07	trig=	2.001500e-07
tpd1	=	6.22465e-10				

B1 VS R1:

Measurements for Transient Analysis

trise1	=	5.402984e-10	targ=	5.902984e-10	trig=	5.000000e-11
tfall1	=	5.715189e-10	targ=	2.007215e-07	trig=	2.001500e-07
tpd1	=	5.55909e-10				

A2 VS R2:

Measurements for Transient Analysis

trise1	=	5.793566e-10	targ=	6.293566e-10	trig=	5.000000e-11
tfall1	=	6.613617e-10	targ=	2.008114e-07	trig=	2.001500e-07
tpd1	=	6.20359e-10				

B2 VS R2:

Measurements for Transient Analysis

trise1	=	5.427070e-10	targ=	5.927070e-10	trig=	5.000000e-11
tfall1	=	6.045308e-10	targ=	2.007545e-07	trig=	2.001500e-07
tpd1	=	5.73619e-10				

A3 VS R3:

Measurements for Transient Analysis

trise1	=	5.477720e-10	targ=	5.977720e-10	trig=	5.000000e-11
tfall1	=	6.532083e-10	targ=	2.008032e-07	trig=	2.001500e-07
tpd1	=	6.00490e-10				

B3 VS R3:

Measurements for Transient Analysis

trise1	=	5.260864e-10	targ=	5.760864e-10	trig=	5.000000e-11
tfall1	=	5.771735e-10	targ=	2.007272e-07	trig=	2.001500e-07
tpd1	=	5.51630e-10				

CRITICAL PATH : (MAX DELAY) :

Measurements for Transient Analysis

trise1	=	5.629671e-10	targ=	6.129671e-10	trig=	5.000000e-11
tfall1	=	6.819627e-10	targ=	2.008320e-07	trig=	2.001500e-07
tpd1	=	6.22465e-10				

