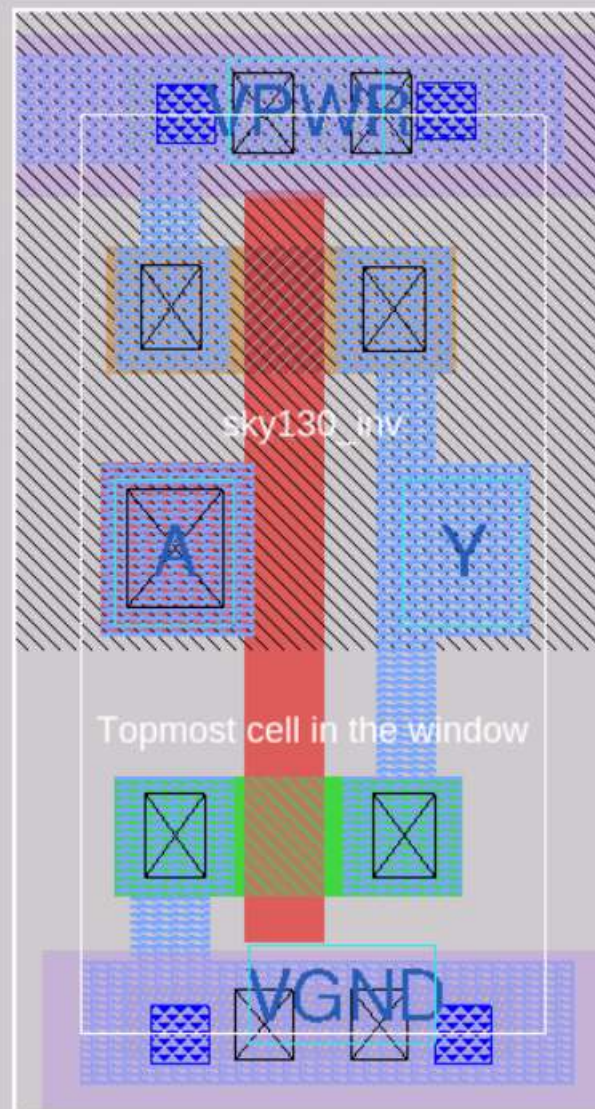


File Edit Tabs Help

```
nishu@f22a0e226f41:~$ cd Desktop
nishu@f22a0e226f41:~/Desktop$ git clone https://github.com/nickson-jose/vsdstdcelldesign.git
Cloning into 'vsdstdcelldesign'...
remote: Enumerating objects: 112, done.
remote: Counting objects: 100% (112/112), done.
remote: Compressing objects: 100% (111/111), done.
remote: Total 438 (delta 58), reused 0 (delta 0), pack-reused 326
Receiving objects: 100% (438/438), 10.24 MiB | 6.32 MiB/s, done.
Resolving deltas: 100% (177/177), done.
nishu@f22a0e226f41:~/Desktop$ ls -ltr
total 8
-rw-r--r-- 1 root root 235 Oct 18 06:19 Terminal.desktop
drwxrwxr-x 6 nishu nishu 4096 Oct 18 06:32 vsdstdcelldesign
nishu@f22a0e226f41:~/Desktop$ cd vsdstdcelldesign
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ ls -ltr
total 140
-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 Images
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 extras
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 libs
-rw-rw-r-- 1 nishu nishu 2716 Oct 18 06:32 skyl30_inv.mag
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 skyl30A.tech
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$
```



File Console Edit Interp Prefs History Help

% what

% what

Selected subcell(s):

Instance "Topmost cell in the window" of cell "sky130\_inv"

% select area

% what

Selected mask layers:

```
nwell      ( Topmost cell in the window )
nmos       ( Topmost cell in the window )
pmos       ( Topmost cell in the window )
ndiff      ( Topmost cell in the window )
pdiff      ( Topmost cell in the window )
ndiffc     ( Topmost cell in the window )
pdiffc     ( Topmost cell in the window )
psubdiff   ( Topmost cell in the window )
nsubdiff   ( Topmost cell in the window )
psubdiffcont ( Topmost cell in the window )
nsubdiffcont ( Topmost cell in the window )
poly       ( Topmost cell in the window )
polycont   ( Topmost cell in the window )
locali     ( Topmost cell in the window )
viali      ( Topmost cell in the window )
metall     ( Topmost cell in the window )
```

Selected label(s):

```
"A" is attached to locali in cell def sky130_inv
"VGND" is attached to metall in cell def sky130_inv
"VPWR" is attached to metall in cell def sky130_inv
"Y" is attached to locali in cell def sky130_inv
```

% box

Root cell box:

width x height ( llx, lly ), ( urx, ury ) area (units^2)

```
microns:    1.77 x 3.28    ( -0.16, -0.29 ), ( 1.61, 2.99 ) 5.81
lambda:     177 x 328     ( -16, -29 ), ( 161, 299 ) 58056
```

% drc check

Loading DRC CIF style.

% drc why

No errors found.

% |



```
lambda: 177 X 520 ( 10, 25 ), ( 101, 255 ) / 50000
% drc check
Loading DRC CIF style.
% drc why
No errors found.
Created database crash recovery file /tmp//MAG426.DKkx0c
% property
{LEFclass CORE} {LEFsite unithd} {FIXED_BBOX 0 0 138 272} {LEFsource USER} {LEForigin 0 0}
% property LEFclass CORE
% property LEFsource USER
%
% lef write sky130_inv.lef
Generating LEF output sky130_inv.lef for cell sky130_inv:
Diagnostic: Write LEF header for cell sky130_inv
Diagnostic: Writing LEF output for cell sky130_inv
Diagnostic: Scale value is 0.010000
% |
```

% what

Selected mask layers:

nmos ( Topmost cell in the window )

% what

Selected mask layers:

pmos ( Topmost cell in the window )

% what

Selected mask layers:

locali ( Topmost cell in the window )

Selected label(s):

"Y" is attached to locali in cell def sky130\_inv

% what

Selected mask layers:

nwell ( Topmost cell in the window )

pdiff ( Topmost cell in the window )

pdifffc ( Topmost cell in the window )

nsubdiff ( Topmost cell in the window )

nsubdiffcont ( Topmost cell in the window )

locali ( Topmost cell in the window )

viali ( Topmost cell in the window )

metall ( Topmost cell in the window )

Selected label(s):

"VPWR" is attached to metall in cell def sky130\_inv

% |

```
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ magic -T sky130A.tech sky130_inv.mag &
[1] 426
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ ls -ltr
total 148
-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 Images
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 extras
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 libs
-rw-rw-r-- 1 nishu nishu 2716 Oct 18 06:32 sky130_inv.mag
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 sky130A.tech
-rw-rw-r-- 1 nishu nishu 1448 Oct 18 07:11 sky130_inv.lef
-rw-rw-r-- 1 nishu nishu 1232 Oct 18 07:58 sky130_inv.ext
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$
```

```
% ext2spice cthresh 0 rthresh 0
```

```
% ext2spice
```

```
exttospice finished.
```



```
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ ls -ltr
total 148
-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 Images
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 extras
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 libs
-rw-rw-r-- 1 nishu nishu 2716 Oct 18 06:32 sky130_inv.mag
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 sky130A.tech
-rw-rw-r-- 1 nishu nishu 1448 Oct 18 07:11 sky130_inv.lef
-rw-rw-r-- 1 nishu nishu 1232 Oct 18 07:58 sky130_inv.ext
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ ls -ltr
```

```
total 152
-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 Images
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 extras
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 libs
-rw-rw-r-- 1 nishu nishu 2716 Oct 18 06:32 sky130_inv.mag
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 sky130A.tech
-rw-rw-r-- 1 nishu nishu 1448 Oct 18 07:11 sky130_inv.lef
-rw-rw-r-- 1 nishu nishu 1232 Oct 18 07:58 sky130_inv.ext
-rw-rw-r-- 1 nishu nishu 345 Oct 18 08:09 sky130_inv.spice
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$
```



```
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ ls -ltr
```

```
total 152
```

```
-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE
drwxrwxr-x 2 nishu nishu  4096 Oct 18 06:32 Images
drwxrwxr-x 2 nishu nishu  4096 Oct 18 06:32 extras
drwxrwxr-x 2 nishu nishu  4096 Oct 18 06:32 libs
-rw-rw-r-- 1 nishu nishu  2716 Oct 18 06:32 sky130_inv.mag
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 sky130A.tech
-rw-rw-r-- 1 nishu nishu  1448 Oct 18 07:11 sky130_inv.lef
-rw-rw-r-- 1 nishu nishu  1232 Oct 18 07:58 sky130_inv.ext
-rw-rw-r-- 1 nishu nishu   345 Oct 18 08:09 sky130_inv.spice
```

```
nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign$ vim sky130_inv.spice
```

File Edit Tabs Help

nishu@f22a...



nishu@f22a...



```
% SPICE3 file created from sky130_inv.ext - technology: sky130A
```

```
.option scale=10000u
```

```
VS .subckt sky130_inv A Y VPWR VGND
M1000 Y A VPWR VPWR pshort w=37 l=23
+ ad=1443 pd=152 as=1517 ps=156
M1001 Y A VGND VGND nshort w=35 l=23
+ ad=1435 pd=152 as=1365 ps=148
C0 VPWR Y 0.11fF
C1 VPWR A 0.07fF
C2 A Y 0.05fF
C3 Y 0 0.24fF
C4 VPWR 0 0.59fF
.ends
```

File Edit Tabs Help

nishu@f22a... x nishu@f22a... x nishu@f22a... x

nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign\$ ls -ltr

total 152

-rw-rw-r-- 1 nishu nishu 14233 Oct 18 06:32 README.md  
-rw-rw-r-- 1 nishu nishu 11357 Oct 18 06:32 LICENSE  
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 Images  
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 extras  
drwxrwxr-x 2 nishu nishu 4096 Oct 18 06:32 libs  
-rw-rw-r-- 1 nishu nishu 2716 Oct 18 06:32 sky130\_inv.mag  
-rw-rw-r-- 1 nishu nishu 94245 Oct 18 06:32 sky130A.tech  
-rw-rw-r-- 1 nishu nishu 1448 Oct 18 07:11 sky130\_inv.lef  
-rw-rw-r-- 1 nishu nishu 1232 Oct 18 07:58 sky130\_inv.ext  
-rw-rw-r-- 1 nishu nishu 345 Oct 18 08:09 sky130\_inv.spice

nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign\$ cd libs/

nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign/libs\$ ls

nshort.lib sky130A.tech sky130\_fd\_sc\_hd\_slow.lib  
pshort.lib sky130\_fd\_sc\_hd\_fast.lib sky130\_fd\_sc\_hd\_typical.lib

nishu@f22a0e226f41:~/Desktop/vsdstdcelldesign/libs\$

File Edit Tabs Help

nishu@f22a...



nishu@f22a...



nishu@f22a...



SPICE3 file created from sky130\_inv.ext - technology: sky130A

```
.option scale=0.01u
.include ./libs/pshort.lib
.include ./libs/nshort.lib
.subckt sky130_inv A Y VPWR VGND
M1000 Y A VPWR VPWR pshort w=37 l=23
+ ad=1443 pd=152 as=1517 ps=156
M1001 Y A VGND VGND nshort w=35 l=23
+ ad=1435 pd=152 as=1365 ps=148
VDD VPWR 0 3.3V
VSS VGND 0 0V
Va A VGND PULSE(0V 3.3V 0 0.1ns 0.1ns 2ns 4ns)
C0 VPWR Y 0.11fF
C1 VPWR A 0.07fF
C2 A Y 0.05fF
C3 Y 0 0.24fF
C4 VPWR 0 0.59fF
//.ends
.tran 1n 20n
.control
run
.endc
.end
```

File Edit Tabs Help

nishu@f22a...

nishu@f22a...

nishu@f22a...

```
* Copyright 2020 The SkyWater PDK Authors
```

```
*  
* Licensed under the Apache License, Version 2.0 (the "License");  
* you may not use this file except in compliance with the License.  
* You may obtain a copy of the License at
```

```
* https://www.apache.org/licenses/LICENSE-2.0
```

```
* Unless required by applicable law or agreed to in writing, software  
* distributed under the License is distributed on an "AS IS" BASIS,  
* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  
* See the License for the specific language governing permissions and  
* limitations under the License.
```

```
* SPDX-License-Identifier: Apache-2.0
```

```
*Auto-converted ../spectremodels/pshort.pm3 by model_spectre_mismatchmaker.rb  
// converted from amsmodels_s8x/pshort.pm3
```

```
*simulator lang=spectre
```

```
// BSIMTran Version 0.1.24, Created on 4-26-2002
```

```
// Username: hai
```

```
// Command Line: /home/hai/config/cydir/bin/lx86/bsimtran pmos_bsim4.rf pmos -p -npshort pshort_modelnamechanged.pm3  
pshort-overlap.pm PDIV1.PMD pdcv1.pm pshort_bsimtranoutput.pm3
```

```
// Working Directory: /home/hai/models/s8/s8tee/models.3.1/pshort/combined
```

```
// Time: Sun Jun 10 17:40:56 2007
```

```
// Rule File: pmos_bsim4.rf
```

```
// Output File: pshort_bsimtranoutput.pm3
```

```
// Input Files:
```

```
// (1) pshort_modelnamechanged.pm3
```

```
// (2) pshort-overlap.pm
```

```
// (3) PDIV1.PMD
```

```
// (4) pdcv1.pm
```

```
pshort.lib
```



File Edit Tabs Help

nishu@f22a...

nishu@f22a...

nishu@f22a...

```

*inline subckt pshort (d g s b)
*parameters l = 1 w = 1 ad = 0 as = 0 pd = 0 ps = 0 nrd = 0 nrs = 0 sa = 0 sb = 0 sd = 0 mult = 1 nf = 1
*pshort (d g s b) pshort_model 1 = 1 w = w ad = ad as = as pd = pd ps = ps nrd = nrd nrs = nrs sa = sa sb = sb sd = sd
nf = nf
*model pshort model bsim4 {
.model pshort model.0 pmos (
//
// DC IV MOS PARAMETERS
//
+ lmin = 1.45e-07 lmax = 1.55e-07 wmin = 1.255e-06 wmax = 1.265e-06
+ level = 54
+ tn timer = 30
+ version = 4.5
+ toxm = 4.23e-009
+ xj = 1.5e-007
+ ll n = 1
+ lwn = 1
+ wln = 1
+ wwn = 1
+ lint = -1.3994e-008+0.0
+ ll = 0
+ lw = 0
+ wl = 0
+ wint = 7.3039e-009+0.0
+ wl = 0
+ ww = 0
+ ww = 0
+ xl = 0
+ xw = 0
+ mobmod = 0
+ binunit = 2
:

```

File Edit Tabs Help

nishu@110...

nishu@110...

nishu@110...

SPICE3 file created from sky130\_inv.ext - technology: sky130A

```
.option scale=0.01u
.include ./libs/pshort.lib
.include ./libs/nshort.lib
.subckt sky130_inv A Y VPWR VGND
M1000 Y A VPWR VPWR pshort_model.0 w=37 l=23
+ ad=1443 pd=152 as=1517 ps=156
M1001 Y A VGND VGND nshort_model.0 w=35 l=23
+ ad=1435 pd=152 as=1365 ps=148
VDD VPWR 0 3.3V
VSS VGND 0 0V
Va A VGND PULSE(0V 3.3V 0 0.1ns 0.1ns 2ns 4ns)
C0 VPWR Y 0.11fF
C1 VPWR A 0.07fF
C2 A Y 0.05fF
C3 Y 0 0.24fF
C4 VPWR 0 0.59fF
//.ends
.tran 1n 20n
.control
run
.endc
end
```

File Edit Tabs Help

nishu@110... ✖ nishu@110... ✖ nishu@110... ✖

```
** Please get your ngspice manual from http://ngspice.sourceforge.net/docs.html
** Please file your bug-reports at http://ngspice.sourceforge.net/bugrep.html
** Creation Date: Tue Dec 26 17:10:20 UTC 2017
*****
```

```
Circuit: spice3 file created from sky130_inv.ext - technology: sky130a
```

```
Scale set
```

```
Doing analysis at TEMP = 27.000000 and TNOM = 27.000000
```

```
Warning: va: no DC value, transient time 0 value used
```

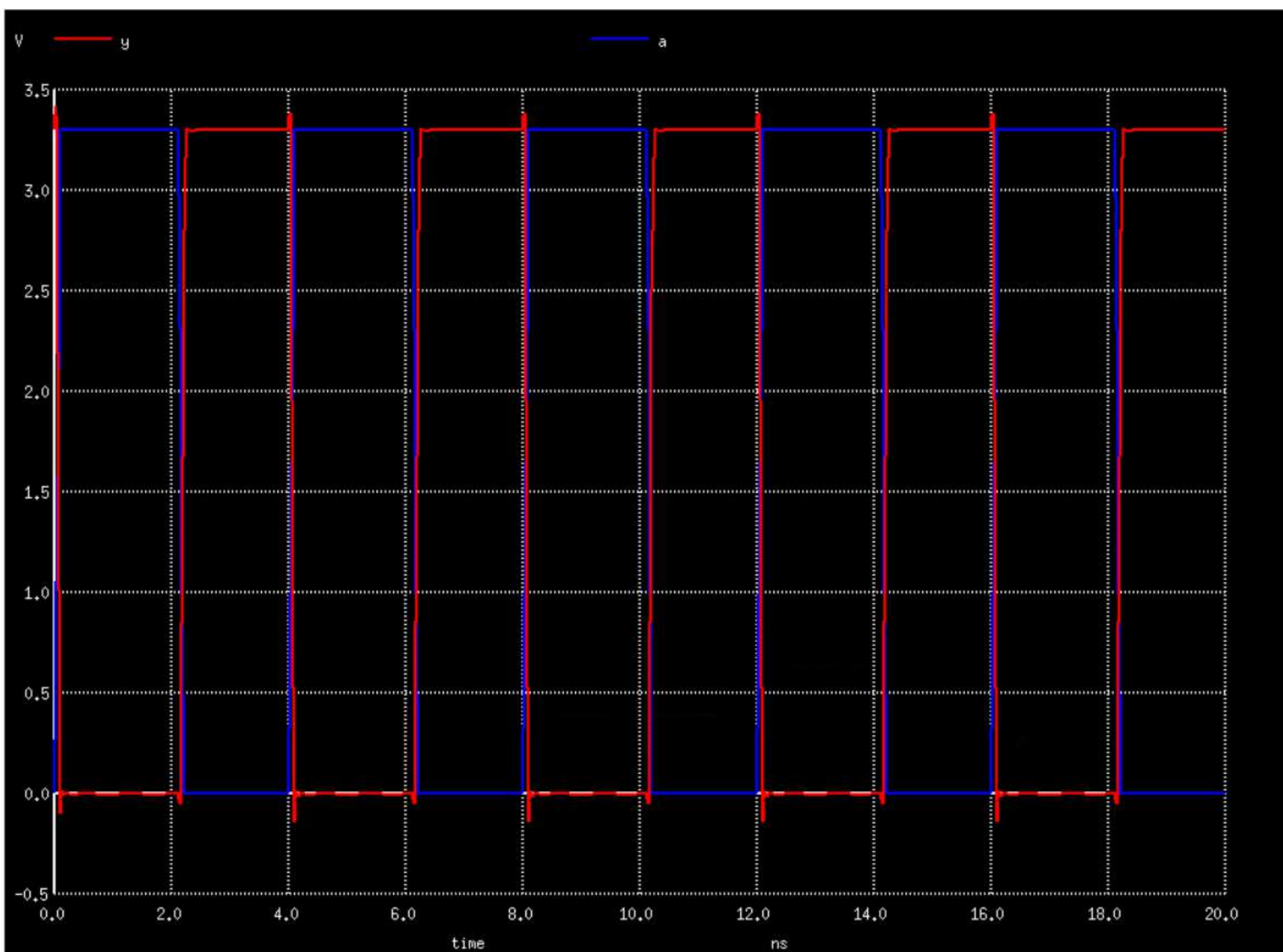
```
Initial Transient Solution
```

```
-----
Node                               Voltage
----                               -
y                                  3.3
a                                  0
vpwr                              3.3
vgnd                              0
va#branch                         0
vss#branch                        3.32412e-12
vdd#branch                       -3.32414e-12
```

```
Reference value : 0.00000e+00
```

```
No. of Data Rows : 145
```

```
ngspice 1 -> █
```



Scale set  
Doing analysis at TEMP = 27.000000 and TNOM = 27.000000  
Warning: va: no DC value, transient time 0 value used

## Initial Transient Solution

Node	Voltage
y	3.3
a	0
vpwr	3.3
vgnd	0
va#branch	0
vss#branch	3.32412e-12
vdd#branch	-3.32414e-12

Reference value : 0.00000e+00

No. of Data Rows : 145

ngspice 1 -> plot y vs time a

ngspice 1 ->

x0 = 6.37647e-09, y0 = 1.65753

x0 = 6.37647e-09, y0 = 1.65753

x0 = 3.97647e-09, y0 = 1.84247      x1 = 8.54118e-09, y1 = 1.73973

dx = 4.56471e-09, dy = -0.10274

dy/dx = -2.25074e+07      dx/dy = -4.44298e-08

x0 = 1.21882e-08, y0 = 1.99315

x0 = 1.21882e-08, y0 = 1.99315



nishu@110...

nishu@110...



```
nishu@1107d64fe984:~/Desktop/vsdstdcelldesign$ vim sky130_inv.spice
nishu@1107d64fe984:~/Desktop/vsdstdcelldesign$ ngspice sky130_inv.spice
*****
** ngspice-27 : Circuit level simulation program
** The U. C. Berkeley CAD Group
** Copyright 1985-1994, Regents of the University of California.
** Please get your ngspice manual from http://ngspice.sourceforge.net/docs.html
** Please file your bug-reports at http://ngspice.sourceforge.net/bugrep.html
** Creation Date: Tue Dec 26 17:10:20 UTC 2017
*****
```

```
Circuit: spice3 file created from sky130_inv.ext - technology: sky130a
```

```
Scale set
```

```
Doing analysis at TEMP = 27.000000 and TNOM = 27.000000
```

```
Warning: va: no DC value, transient time 0 value used
```

```
Initial Transient Solution
```

```
-----
```

Node	Voltage
----	-----
y	3.3
a	0
vpwr	3.3
vgnd	0
va#branch	0
vss#branch	3.32412e-12
vdd#branch	-3.32414e-12

```
No. of Data Rows : 160
```

```
ngspice 1 -> █
```

File Edit Tabs Help

nishu@110...



nishu@110...



nishu@110...



```
nishu@1107d64fe984:~/Desktop/vsdstdcelldesign/libs$ cd ../
nishu@1107d64fe984:~/Desktop/vsdstdcelldesign$ cd ../
nishu@1107d64fe984:~/Desktop$ wget http://opencircuitdesign.com/open_pdks/archive/drc_tests.tgz
--2020-10-18 14:29:06-- http://opencircuitdesign.com/open_pdks/archive/drc_tests.tgz
Resolving opencircuitdesign.com (opencircuitdesign.com)... 69.251.36.209
Connecting to opencircuitdesign.com (opencircuitdesign.com)|69.251.36.209|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 41651 (41K) [application/x-gzip]
Saving to: 'drc_tests.tgz'
```

```
drc_tests.tgz          100%[=====>]  40.67K  55.4KB/s    in 0.7s
```

```
2020-10-18 14:29:09 (55.4 KB/s) - 'drc_tests.tgz' saved [41651/41651]
```

File Edit Tabs Help

nishu@110...



nishu@110...



nishu@110...



```
nishu@1107d64fe984:~/Desktop$ cd drc_tests
nishu@1107d64fe984:~/Desktop/drc_tests$ ls -al
total 276
drwxrwxr-x 2 nishu nishu 4096 Sep 16 15:47 .
drwxrwxr-x 4 nishu nishu 4096 Oct 18 14:30 ..
-rw-rw-r-- 1 nishu nishu 2565 Sep 15 13:57 .magicrc
-rw-rw-r-- 1 nishu nishu 3178 Sep 15 13:42 capm.mag
-rw-rw-r-- 1 nishu nishu 3610 Sep 16 02:41 difftrap.mag
-rw-rw-r-- 1 nishu nishu 1535 Sep 16 02:42 dnwell.mag
-rw-rw-r-- 1 nishu nishu 1684 Sep 15 13:42 hvtp.mag
-rw-rw-r-- 1 nishu nishu 897 Sep 15 13:42 hvtr.mag
-rw-rw-r-- 1 nishu nishu 1480 Sep 15 13:42 li.mag
-rw-rw-r-- 1 nishu nishu 11586 Sep 15 13:42 licon.mag
-rw-rw-r-- 1 nishu nishu 4648 Sep 15 13:42 lvtm.mag
-rw-rw-r-- 1 nishu nishu 1198 Sep 15 13:42 mcon.mag
-rw-rw-r-- 1 nishu nishu 2103 Sep 15 13:42 met1.mag
-rw-rw-r-- 1 nishu nishu 1799 Sep 15 13:42 met2.mag
-rw-rw-r-- 1 nishu nishu 1500 Sep 16 02:42 met3.mag
-rw-rw-r-- 1 nishu nishu 1114 Sep 16 02:43 met4.mag
-rw-rw-r-- 1 nishu nishu 757 Sep 15 13:42 met5.mag
-rw-rw-r-- 1 nishu nishu 1948 Sep 15 13:42 npc.mag
-rw-rw-r-- 1 nishu nishu 2497 Sep 15 13:42 nsd.mag
-rw-rw-r-- 1 nishu nishu 1351 Sep 16 02:39 nwell.mag
-rw-rw-r-- 1 nishu nishu 536 Sep 15 13:42 pad.mag
-rw-rw-r-- 1 nishu nishu 5588 Sep 16 02:45 poly.mag
-rw-rw-r-- 1 nishu nishu 2565 Sep 15 13:42 psd.mag
-rw-rw-r-- 1 nishu nishu 3025 Sep 15 13:42 rpm.mag
-rw-rw-r-- 1 nishu nishu 135962 Sep 16 15:47 sky130A.tech
-rw-rw-r-- 1 nishu nishu 2476 Sep 16 02:44 tunm.mag
-rw-rw-r-- 1 nishu nishu 4114 Sep 16 02:40 varac.mag
-rw-rw-r-- 1 nishu nishu 955 Sep 15 13:42 via.mag
-rw-rw-r-- 1 nishu nishu 1271 Sep 15 13:42 via2.mag
-rw-rw-r-- 1 nishu nishu 1267 Sep 15 13:42 via3.mag
-rw-rw-r-- 1 nishu nishu 966 Sep 15 13:42 via4.mag
nishu@1107d64fe984:~/Desktop/drc_tests$
```

```
puts stdout "Sourcing design .magicrc for technology sky130A ..."  
  
# Put grid on 0.005 pitch. This is important, as some commands don't  
# rescale the grid automatically (such as lef read?).  
  
set scalefac [tech lambda]  
if {[lindex $scalefac 1] < 2} {  
    scalegrid 1 2  
}  
  
# drc off  
drc euclidean on  
  
# Allow override of PDK path from environment variable PDKPATH  
if {[catch {set PDKPATH $env(PDKPATH)}}] {  
    set PDKPATH "~/cad/pdks/sky130A"  
}  
  
# loading technology  
# tech load $PDKPATH/libs.tech/magic/sky130A.tech  
tech load sky130A.tech  
  
# load device generator  
# source $PDKPATH/libs.tech/magic/sky130A.tcl  
  
# load bind keys (optional)  
# source $PDKPATH/libs.tech/magic/sky130A-BindKeys  
  
# set units to lambda grid  
snap lambda  
  
# set sky130 standard power, ground, and substrate names  
set VDD VPWR  
set GND VGND  
".magicrc" 74L, 2565C
```



File Edit Tabs Help

nishu@110...



nishu@110...



nishu@110...



```
nishu@1107d64fe984:~/Desktop/vsdstdcelldesign$ ngspice sky130_inv.spice
```

```
*****  
** ngspice-27 : Circuit level simulation program  
** The U. C. Berkeley CAD Group  
** Copyright 1985-1994, Regents of the University of California.  
** Please get your ngspice manual from http://ngspice.sourceforge.net/docs.html  
** Please file your bug-reports at http://ngspice.sourceforge.net/bugrep.html  
** Creation Date: Tue Dec 26 17:10:20 UTC 2017  
*****
```

```
Circuit: spice3 file created from sky130_inv.ext - technology: sky130a
```

```
Scale set
```

```
ngspice 1 -> █
```



$x_0 = 2.16635e-09$ ,  $y_0 = 1.712103$

$x_0 = 2.21095e-09$ ,  $y_0 = 1.64976$

$x_0 = 2.15e-09$ ,  $y_0 = 1.65024$



$x_0 = 2.18064e-09, y_0 = 0.660092$

$x_0 = 2.17738e-09, y_0 = 2.64$

$x_0 = 2.24569e-09, y_0 = 2.64011$

$x_0 = 2.24569e-09, y_0 = 2.64011$



2.240

2.241

2.242

2.245