Report- 15

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Show Deference Between Without Trojan and with Trojan Circuit

1. Job statistics summary

No	Without Trojan	With Trojan
01	tnom= 25.000	tnom= 25.000
02	temp= 25.000	temp= 25.000

2. HSPICE Threads Information

No	Without Trojan	With Trojan
01	Command Line Threads Count :1	Command Line Threads Count :1
02	Available CPU Count :8	Available CPU Count :8
03	Actual Threads Count :1	Actual Threads Count :1

3. Circuit Statistics

No	Without Trojan	With Trojan
01	nodes = 31	nodes = 43
02	elements = 8	elements = 10
03	mosfets = 6	mosfets = 8
04	volt_srcs = 2	volt_srcs = 2

4. Without Trojan:

```
****** Runtime Statistics (seconds) ******
analysis        time   # points  tot. iter        conv.iter
op point        0.00      1        23
transient       0.01     201      655         125 rev= 13
readin          0.03
errchk          0.01
setup           0.00
output          0.00
        peak memory used        48.61 megabytes
        total cpu time          0.02 seconds
        total elapsed time      0.21 seconds
```
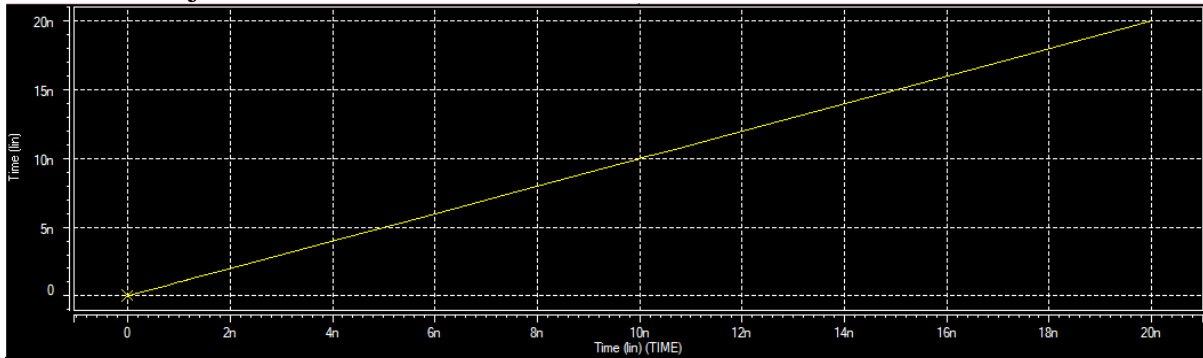
With Trojan:

```
****** Runtime Statistics (seconds) ******
analysis        time   # points  tot. iter        conv.iter
op point        0.00      1        21
transient       0.03     201      737         131 rev=      33
readin          0.02
errchk          0.01
setup           0.00
output          0.00
        peak memory used        48.59 megabytes
        total cpu time          0.03 seconds
        total elapsed time      0.19seconds
```
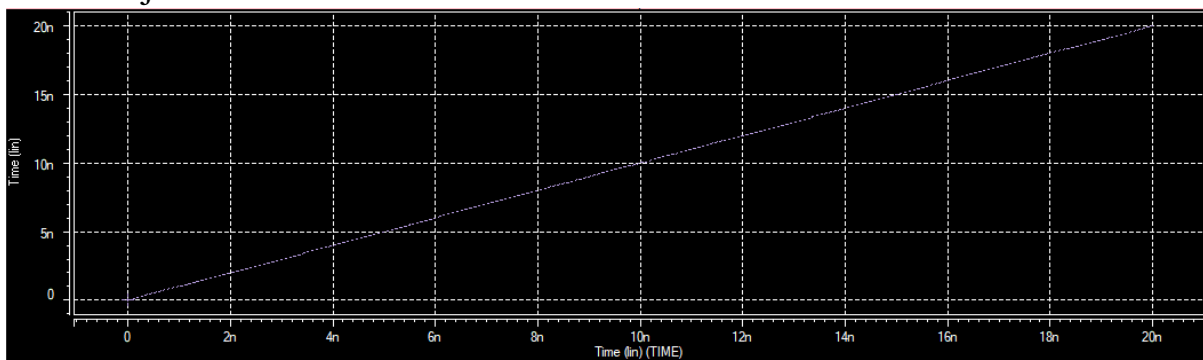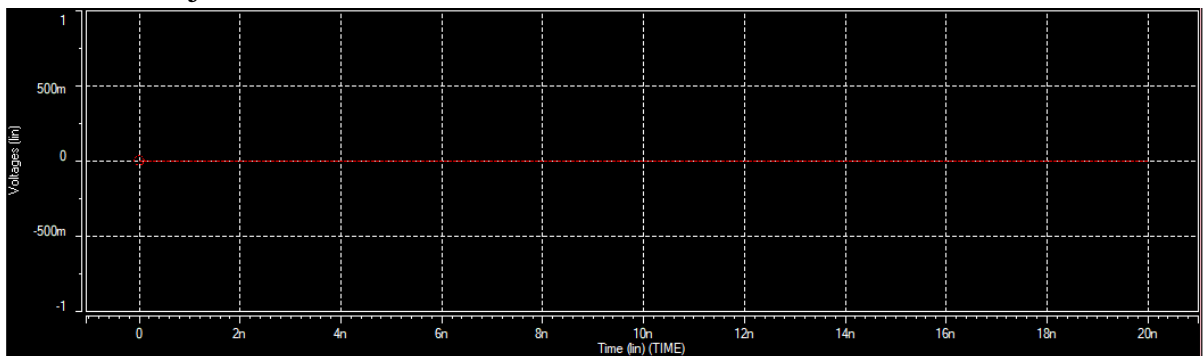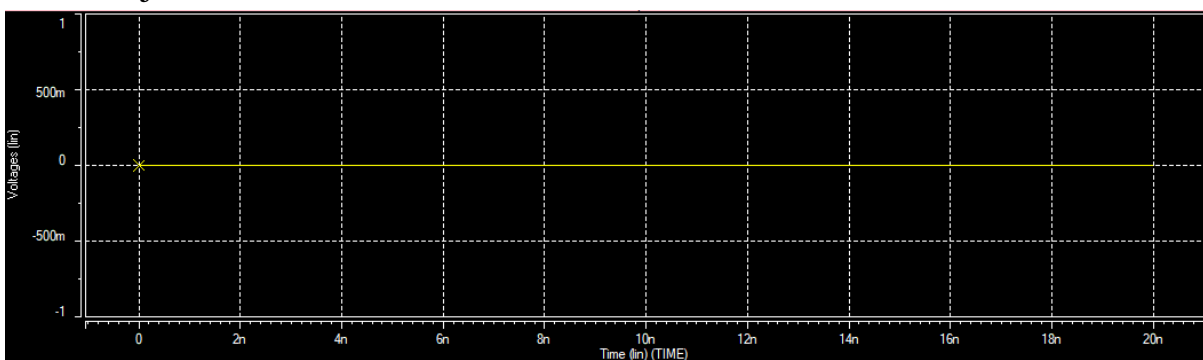
Graph Difference

1. Time

Without Trojan:

With Trojan:

Remarks: Same

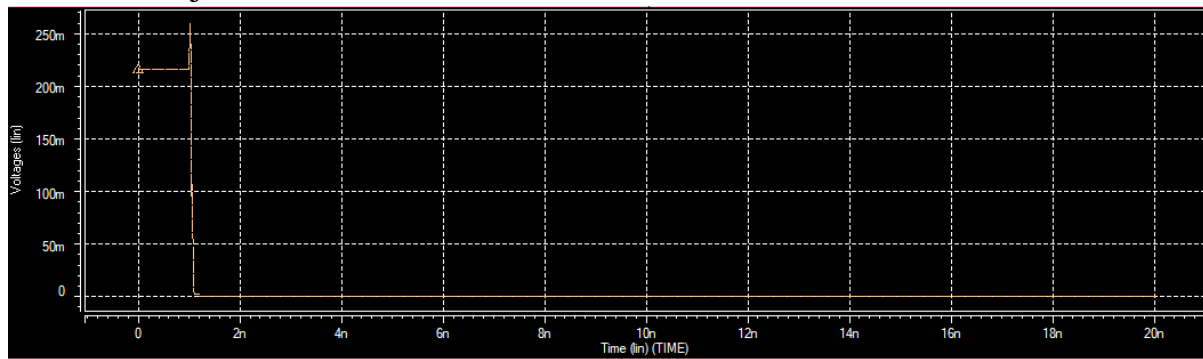## 2. Voltage [v(0)]
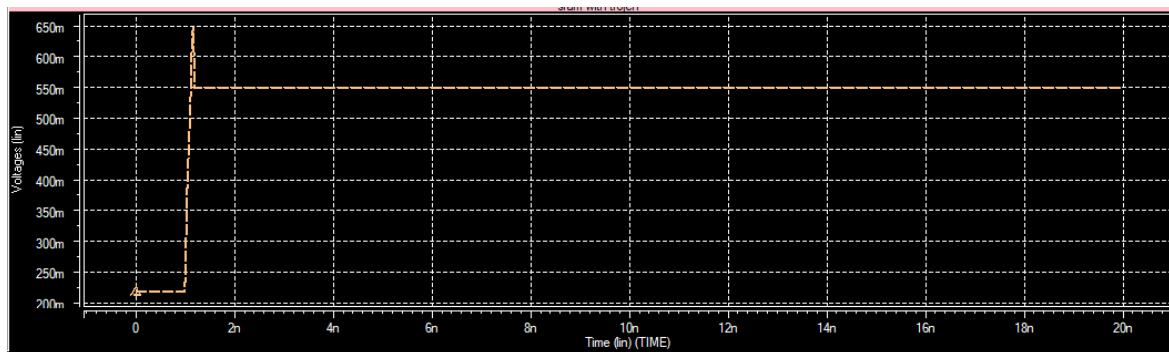
Without Trojan:

With Trojan:

Remarks: Same

3. Voltage [v(bl)]

Without Trojan:

With Trojan:

4. Voltage [v(blb)]

Without Trojan:

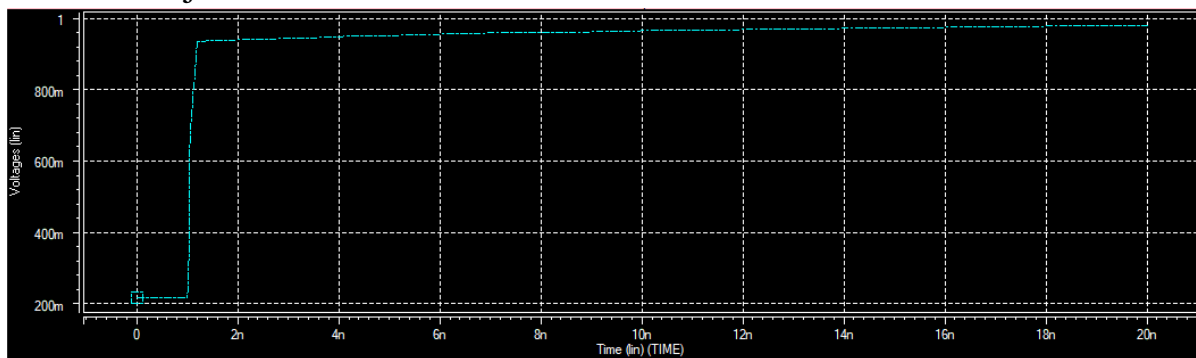With Trojan:

5. Voltage [v(q)]

Without Trojan:
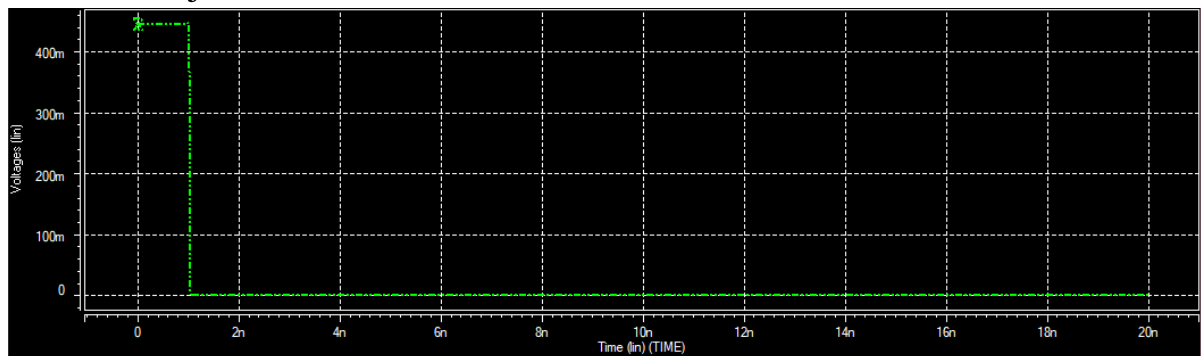
With Trojan:
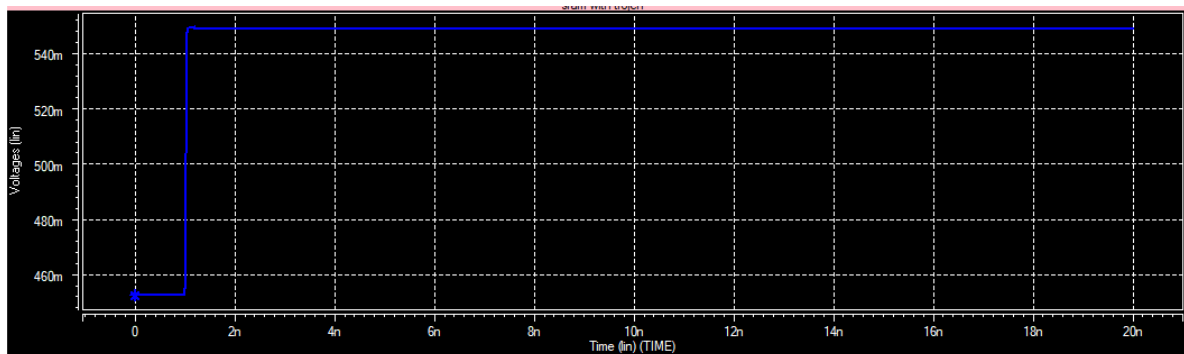
Remarks: Not Same

6. Voltage [v(qr)]

Without Trojan:
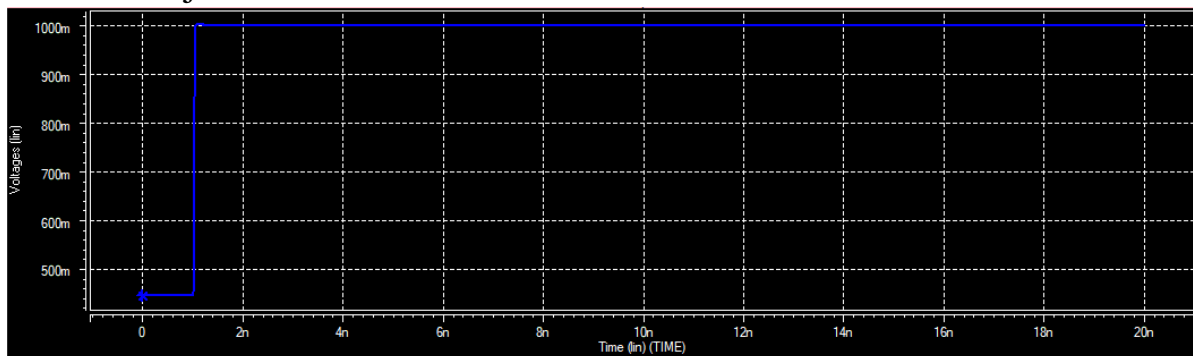
With Trojan:
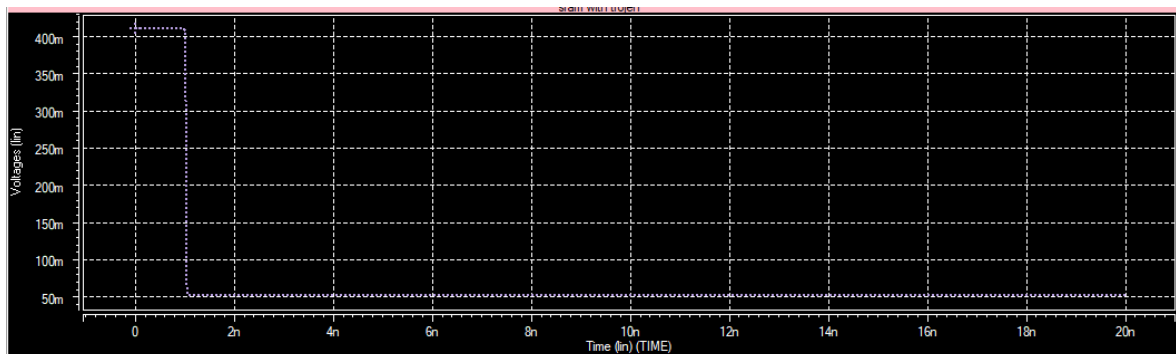
Remarks: Not Same

7. Voltage [v(vdd)]

Without Trojan:

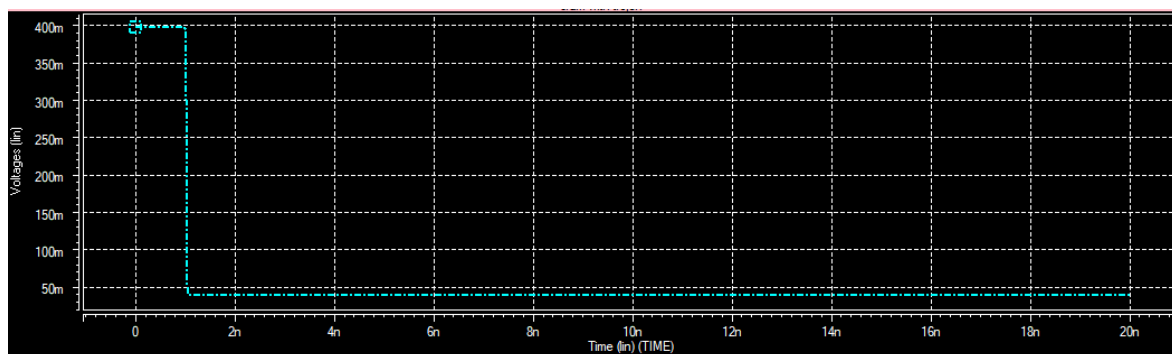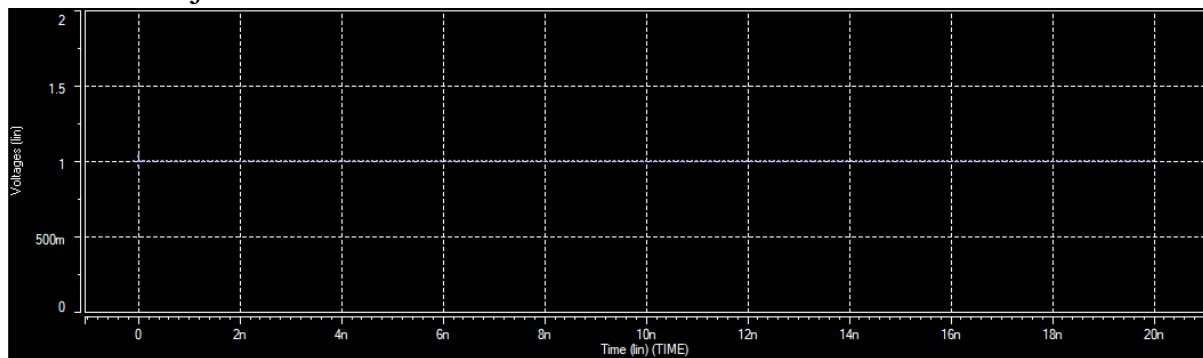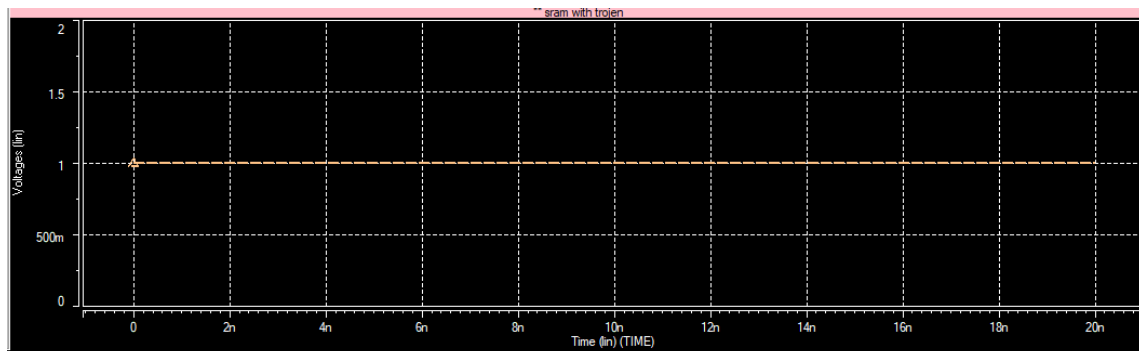With Trojan:

8. Voltage [v(wl)]

Without Trojan:
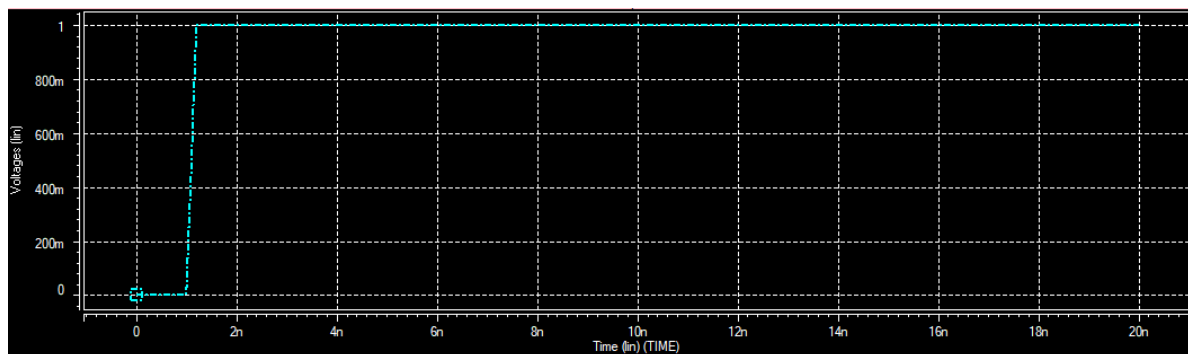
With Trojan:

9. **Current [i(vvdd)]**
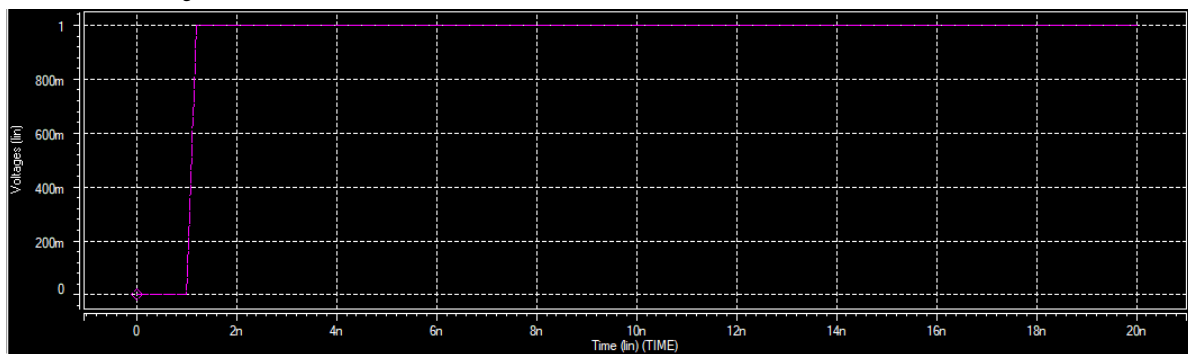Without Trojan:
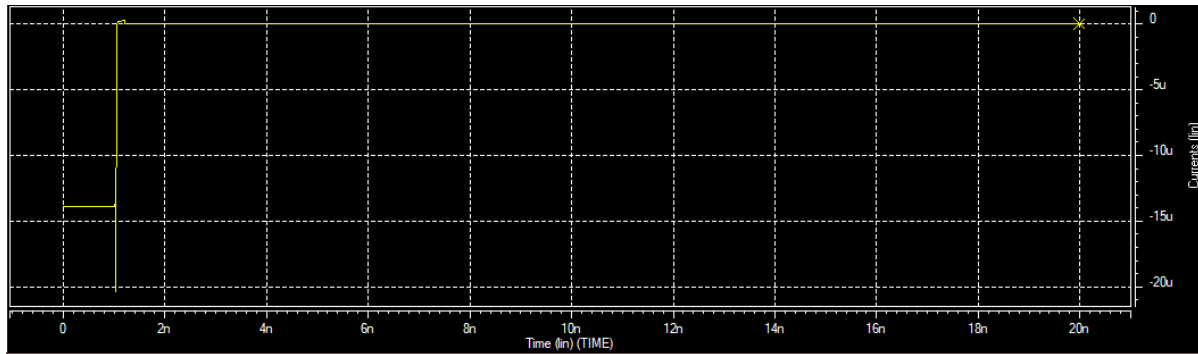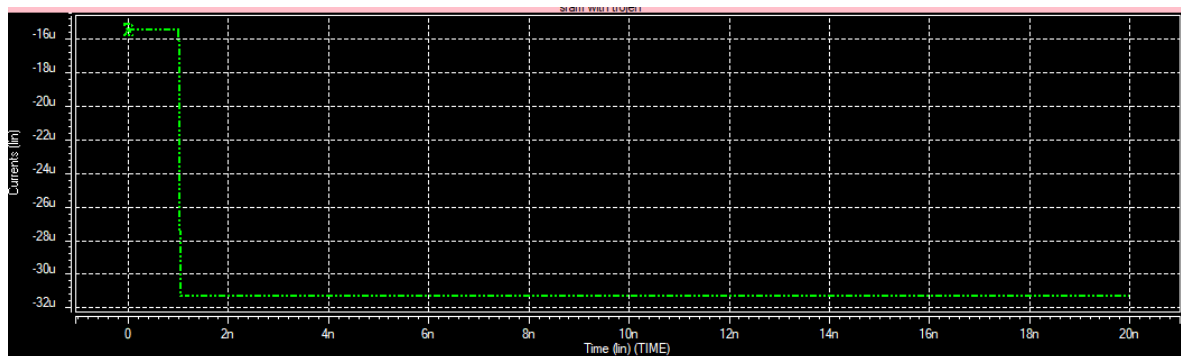
With Trojan:

10. **Current [i(vwl)]**
Without Trojan:
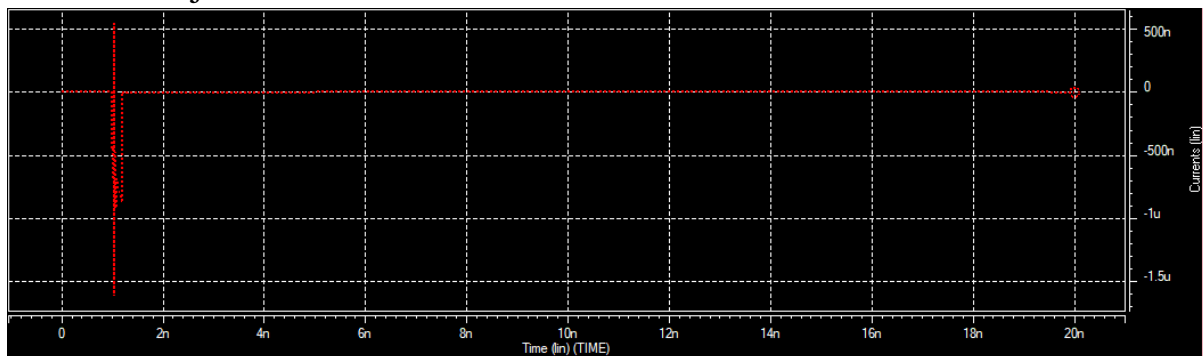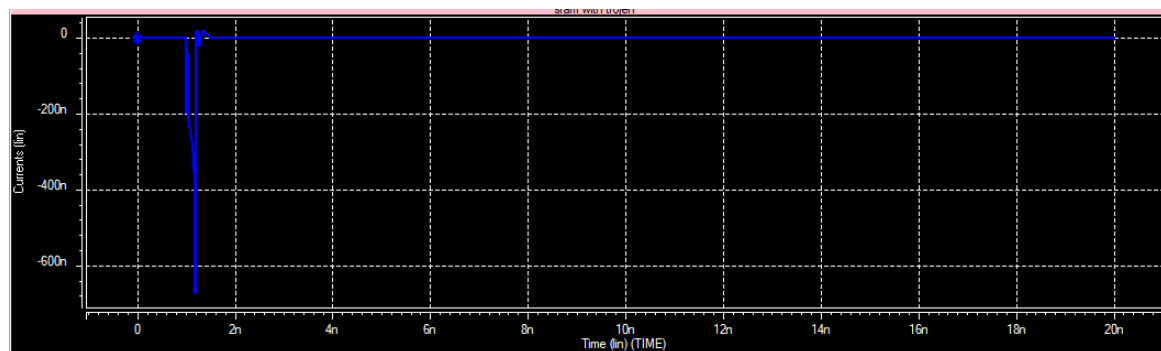
With Trojan:

Some voltage which show only with Trojan SRAM

11. **V(t)**
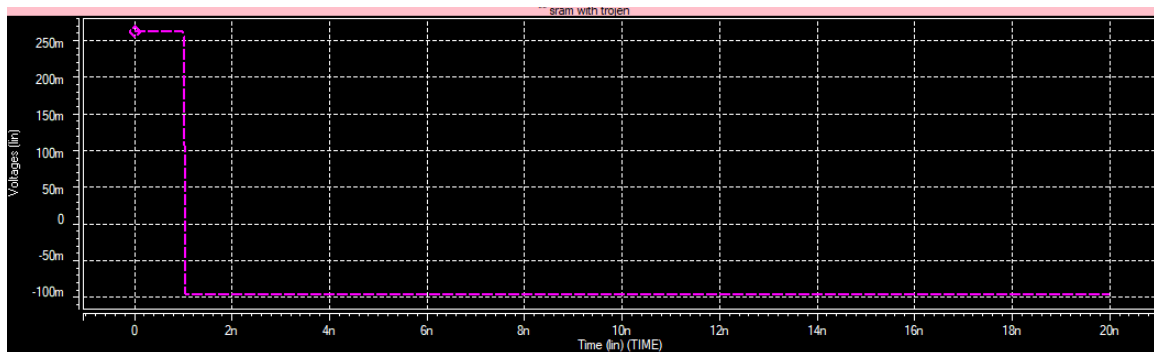
12. V(t1)
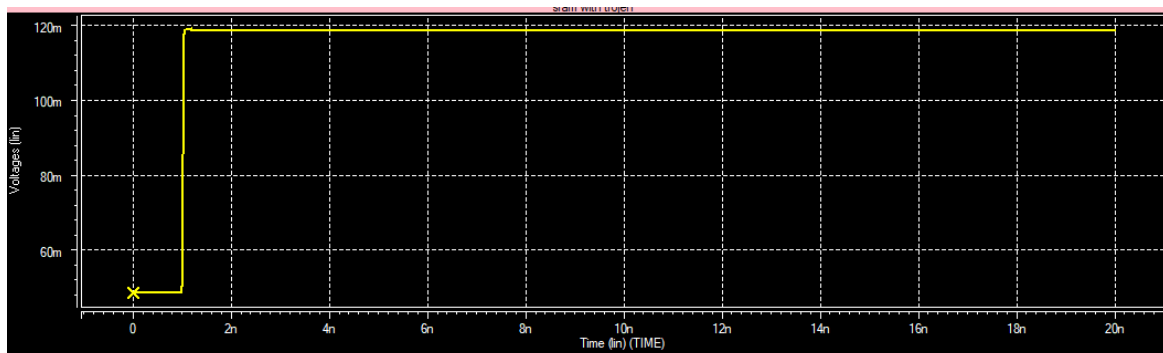
13. **v (t2)**
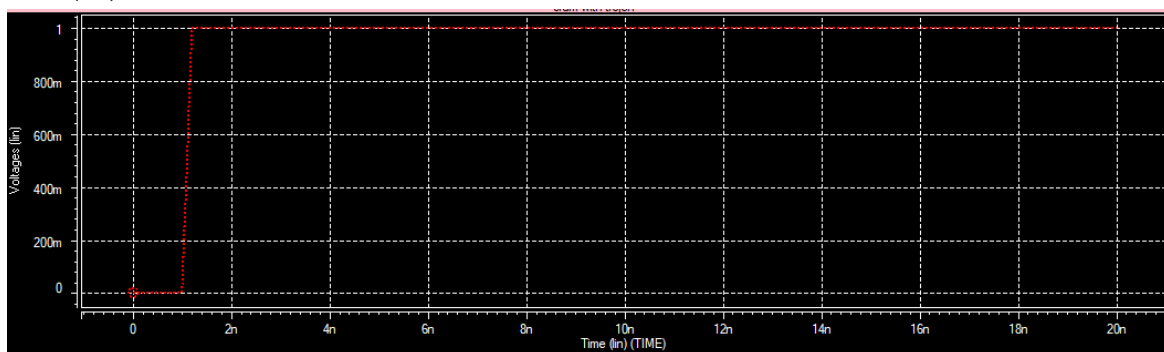
14. V(i6)
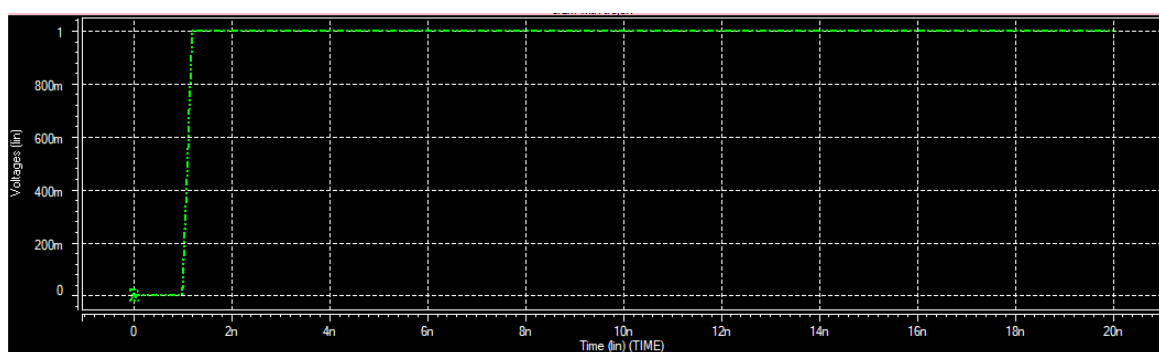
Read

15. Without Trojan
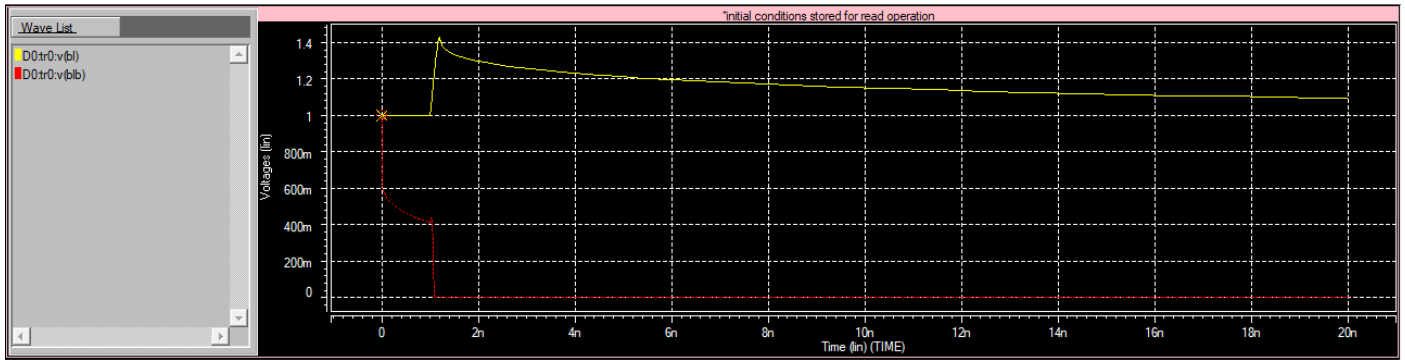
Read 1 Successfully

16. With Trojan
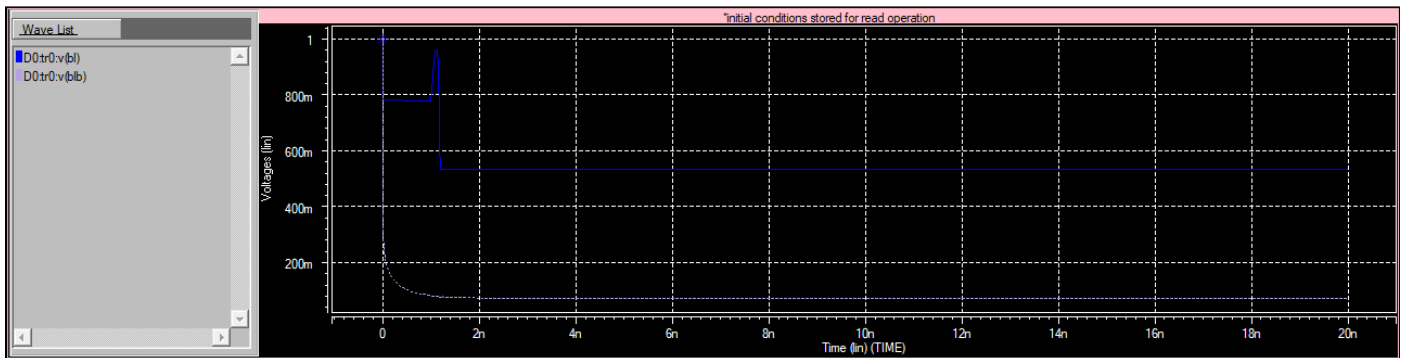
Read Error

Netlist Without Trojan

** SRAM without trojen

M1 Q X 0 0 nmos w=90n l=45n

M2 Q X vdd vdd pmos w=90n l=45n

M3 QR Y 0 0 nmos w=90n l=45n

M4 QR Y vdd vdd pmos w=90n l=45n

Mi5 Q wl bl bl nmos w=90n l=45n

M6 blb wl QR blb nmos w=90n l=45n

** Voltage source

Vvdd vdd 0 1

**Access Control

Vwl wl 0 pwl(0 0 1n 0 1.2n 1 5n 1)

.tran 0.1n 20n

.model nmos nmos level = 54

+version = 4.0   binunit = 1   paramchk= 1   mobmod = 0

+capmod = 2   igcmod = 1   igbmod = 1   geomod = 1

+diomod = 1   rdsmod = 0   rbodymod= 1   rgatemod= 1

+permod = 1   acnqsmod= 0   trnqsmod= 0

* parameters related to the technology node

+tnom = 27   epsrox = 3.9

+eta0 = 0.0049   nfactor = 2.1   wint = 5e-09

+cgso = 1.1e-10   cgdo = 1.1e-10   xl = -2e-08

* parameters customized by the user

+toxe = 1.75e-09   toxp = 1.1e-09   toxm = 1.75e-09   toxref = 1.75e-09

+dtox = 6.5e-10   lint = 3.75e-09

+vth0 = 0.469   k1 = 0.528   u0 = 0.04372   vsat = 147390

+rdsw = 155   ndep = 3.28e+18   xj = 1.4e-08

* secondary parameters

+ll   = 0   wl   = 0   lln   = 1   wln   = 1

+lw   = 0   ww   = 0   lwn   = 1   wwn   = 1

+lwl   = 0   wwl   = 0   xpart   = 0

+k2   = 0.01   k3   = 0

+k3b   = 0   w0   = 2.5e-006   dvt0   = 1   dvt1   = 2

+dvt2   = -0.032   dvt0w = 0   dvt1w = 0   dvt2w = 0

```
+dsub    = 0.1       minv   = 0.05       voffl  = 0        dvtp0  = 1.0e-009
+dvtp1   = 0.1       lpe0   = 0          lpeb   = 0
+ngate   = 2e+020    nsd    = 2e+020     phin   = 0
+cdsc    = 0.000     cdscb  = 0          cdscd  = 0        cit    = 0
+voff    = -0.13     etab   = 0
+vfb     = -0.55     ua     = 6e-010     ub     = 1.2e-018
+uc      = 0         a0     = 1.0        ags    = 1e-020
+a1      = 0         a2     = 1.0        b0     = 0        b1     = 0
+keta    = 0.04      dwg    = 0          dwb    = 0        pclm   = 0.04
+pdiblc1 = 0.001     pdiblc2 = 0.001     pdiblcb = -0.005  drout  = 0.5
+pvag    = 1e-020    delta  = 0.01       pscbe1 = 8.14e+008   pscbe2 = 1e-007
+fprout  = 0.2       pdits  = 0.08       pditsd = 0.23      pditsl = 2.3e+006
+rsh     = 5         rsw    = 85         rdw    = 85
+rdswmin = 0         rdwmin = 0          rswmin = 0        prwg   = 0
+prwb    = 6.8e-011  wr     = 1          alpha0 = 0.074     alpha1 = 0.005
+beta0   = 30        agidl  = 0.0002     bgidl  = 2.1e+009  cgidl  = 0.0002
+egidl   = 0.8
+aigbacc = 0.012     bigbacc = 0.0028    cigbacc = 0.002
+nigbacc = 1         aigbinv = 0.014     bigbinv = 0.004    cigbinv = 0.004
+eigbinv = 1.1       nigbinv = 3         aigc   = 0.012     bigc   = 0.0028
+cigc    = 0.002     aigsd  = 0.012      bigsd  = 0.0028    cigsd  = 0.002
+nigc    = 1         poxedge = 1         pigcd  = 1        ntox   = 1
+xrcrg1  = 12        xrcrg2 = 5
+cgbo    = 2.56e-011  cgdl  = 2.653e-10
+cgsl    = 2.653e-10  ckappas = 0.03     ckappad = 0.03     acde   = 1
+moin    = 15        noff   = 0.9        voffcv = 0.02
+kt1     = -0.11     kt1l   = 0          kt2    = 0.022     ute    = -1.5
+ua1     = 4.31e-009  ub1   = 7.61e-018  uc1    = -5.6e-011  prt    = 0
+at      = 33000
+fnoimod = 1         tnoimod = 0
+jss     = 0.0001    jsws   = 1e-011     jswgs  = 1e-010    njs    = 1
+ijthsfwd= 0.01      ijthsrev= 0.001     bvs    = 10        xjbvs  = 1
+jsd     = 0.0001    jswd   = 1e-011     jswgd  = 1e-010    njd    = 1
+ijthdfwd= 0.01      ijthdrev= 0.001     bvd    = 10        xjbvd  = 1
+pbs     = 1         cjs    = 0.0005     mjs    = 0.5       pbsws  = 1
```

+cjsws = 5e-010   mjsws = 0.33   pbswgs = 1   cjswgs = 3e-010

+mjswgs = 0.33   pbd   = 1   cjd   = 0.0005   mjd   = 0.5

+pbswd = 1   cjswd = 5e-010   mjswd = 0.33   pbswgd = 1

+cjswgd = 5e-010   mjswgd = 0.33   tpb   = 0.005   tcj   = 0.001

+tpbsw = 0.005   tcjsw = 0.001   tpbswg = 0.005   tcjswg = 0.001

+xtis   = 3   xtid   = 3

+dmcg   = 0e-006   dmci   = 0e-006   dmdg   = 0e-006   dmcgt   = 0e-007

+dwj   = 0.0e-008   xgw   = 0e-007   xgl   = 0e-008

+rshg   = 0.4   gbmin = 1e-010   rbpb   = 5   rbpd   = 15

+rbps   = 15   rbdb   = 15   rbsb   = 15   ngcon   = 1

.model pmos pmos level = 54

+version = 4.0   binunit = 1   paramchk= 1   mobmod = 0

+capmod = 2   igcmod = 1   igbmod = 1   geomod = 1

+diomod = 1   rdsmod = 0   rbodymod= 1   rgatemod= 1

+permod = 1   acnqsmod= 0   trnqsmod= 0

* parameters related to the technology node

+tnom = 27   epsrox = 3.9

+eta0 = 0.0049   nfactor = 2.1   wint = 5e-09

+cgso = 1.1e-10   cgdo = 1.1e-10   xl = -2e-08

* parameters customized by the user

+toxe = 1.85e-09   toxp = 1.1e-09   toxm = 1.85e-09   toxref = 1.85e-09

+dtox = 7.5e-10   lint = 3.75e-09

+vth0 = -0.418   k1 = 0.488   u0 = 0.00439   vsat = 70000

+rdsw = 155   ndep = 2.5e+18   xj = 1.4e-08

*secondary parameters

+ll   = 0   wl   = 0   lln   = 1   wln   = 1

+lw   = 0   ww   = 0   lwn   = 1   wwn   = 1

+lwl   = 0   wwl   = 0   xpart = 0

+k2   = -0.01   k3   = 0

+k3b   = 0   w0   = 2.5e-006   dvt0   = 1   dvt1   = 2

+dvt2   = -0.032   dvt0w = 0   dvt1w = 0   dvt2w   = 0

+dsub   = 0.1   minv   = 0.05   voffl = 0   dvtp0   = 1e-009

+dvtp1   = 0.05   lpe0   = 0   lpeb   = 0

+ngate   = 2e+020   nsd   = 2e+020   phin   = 0

+cdsc   = 0.000   cdscb = 0   cdscd = 0   cit   = 0

+voff   = -0.126   etab   = 0

+vfb   = 0.55   ua   = 2.0e-009   ub   = 0.5e-018

+uc   = 0   a0   = 1.0   ags   = 1e-020

+a1   = 0   a2   = 1   b0   = -1e-020   b1   = 0

+keta   = -0.047   dwg   = 0   dwb   = 0   pclm   = 0.12

+pdiblc1 = 0.001   pdiblc2 = 0.001   pdiblcb = 3.4e-008   drout = 0.56

+pvag   = 1e-020   delta = 0.01   pscbe1 = 8.14e+008   pscbe2 = 9.58e-007

+fprout = 0.2   pdits = 0.08   pditsd = 0.23   pditsl = 2.3e+006

+rsh   = 5   rsw   = 85   rdw   = 85

+rdswmin = 0   rdwmin = 0   rswmin = 0   prwg   = 3.22e-008

+prwb   = 6.8e-011 wr   = 1   alpha0 = 0.074   alpha1 = 0.005

+beta0 = 30   agidl = 0.0002   bgidl = 2.1e+009   cgidl = 0.0002

+egidl = 0.8

+aigbacc = 0.012   bigbacc = 0.0028   cigbacc = 0.002

+nigbacc = 1   aigbinv = 0.014   bigbinv = 0.004   cigbinv = 0.004

+eigbinv = 1.1   nigbinv = 3   aigc   = 0.69   bigc   = 0.0012

+cigc   = 0.0008   aigsd = 0.0087   bigsd = 0.0012   cigsd = 0.0008

+nigc   = 1   poxedge = 1   pigcd = 1   ntox   = 1

+xrcrg1 = 12   xrcrg2 = 5

+cgbo   = 2.56e-011 cgdl   = 2.653e-10

+cgsl   = 2.653e-10 ckappas = 0.03   ckappad = 0.03   acde   = 1

+moin   = 15   noff   = 0.9   voffcv = 0.02

+kt1   = -0.11   kt1l   = 0   kt2   = 0.022   ute   = -1.5

+ua1   = 4.31e-009 ub1   = 7.61e-018   uc1   = -5.6e-011   prt   = 0

+at   = 33000

+fnoimod = 1   tnoimod = 0

+jss   = 0.0001   jsws   = 1e-011   jswgs = 1e-010   njs   = 1

+ijthsfwd = 0.01   ijthsrev = 0.001   bvs   = 10   xjbvs = 1

+jsd   = 0.0001   jswd   = 1e-011   jswgd = 1e-010   njd   = 1

+ijthdfwd = 0.01   ijthdrev = 0.001   bvd   = 10   xjbvd = 1

+pbs   = 1   cjs   = 0.0005   mjs   = 0.5   pbsws = 1

+cjsws = 5e-010   mjsws = 0.33   pbswgs = 1   cjswgs = 3e-010

+mjswgs = 0.33   pbd   = 1   cjd   = 0.0005   mjd   = 0.5

+pbswd = 1   cjswd = 5e-010   mjswd = 0.33   pbswgd = 1

+cjswgd = 5e-010   mjswgd = 0.33   tpb   = 0.005   tcj   = 0.001

+tpbsw = 0.005   tcjsw = 0.001   tpbswg = 0.005   tcjswg = 0.001

+xtis   = 3   xtid   = 3

+dmcg   = 0e-006   dmci   = 0e-006   dmdg   = 0e-006   dmcgt   = 0e-007

+dwj   = 0.0e-008   xgw   = 0e-007   xgl   = 0e-008

+rshg   = 0.4   gbmin = 1e-010   rbpb   = 5   rbpd   = 15

+rbps   = 15   rbdb   = 15   rbsb   = 15   ngcon   = 1

.options POST=2

.options AUTOSTOP

.options INGOLD=2 DCON=1

.options GSHUNT=1e-12 RMIN=1e-15

.options ABSTOL=1e-5 ABSVDC=1e-4

.options RELTOL=1e-2 RELVDC=1e-2

.options NUMDGT=4 PIVOT=13

.options runlvl=6

.end

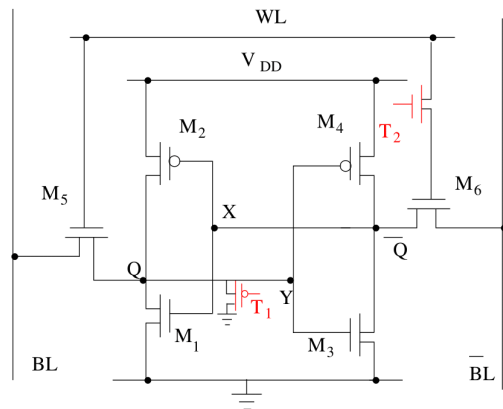# Netlist with Trojan

** SRAM with trojen

M1 Q QR 0 0 nmos w=90n l=45n

M2 Q QR vdd vdd pmos w=90n l=45n

M3 QR Q 0 0 nmos w=90n l=45n

M4 QR Q vdd vdd pmos w=90n l=45n

M5 Q wl bl bl nmos w=90n l=45n

Mi6 blb T QR blb nmos w=90n l=45n

MT i6 T2 wl wl nmos w=90n l=45n

MTr Q T1 0 0 pmos w=90n l=45n

** Voltage source

Vvdd vdd 0 1

**Access Control

Vwl wl 0 pwl(0 0 1n 0 1.2n 1 5n 1)

.tran 0.1n 20n

.model nmos nmos level = 54

+version = 4.0   binunit = 1   paramchk= 1   mobmod = 0

+capmod = 2   igcmod = 1   igbmod = 1   geomod = 1

+diomod = 1   rdsmod = 0   rbodymod= 1   rgatemod= 1

+permod = 1   acnqsmod= 0   trnqsmod= 0

* parameters related to the technology node

+tnom = 27   epsrox = 3.9

+eta0 = 0.0049   nfactor = 2.1   wint = 5e-09

+cgso = 1.1e-10   cgdo = 1.1e-10   xl = -2e-08

* parameters customized by the user

+toxe = 1.75e-09   toxp = 1.1e-09   toxm = 1.75e-09   toxref = 1.75e-09

+dtox = 6.5e-10   lint = 3.75e-09

+vth0 = 0.469   k1 = 0.528   u0 = 0.04372   vsat = 147390

+rdsw = 155   ndep = 3.28e+18   xj = 1.4e-08

* secondary parameters

+ll   = 0   wl   = 0   lln   = 1   wln   = 1

+lw   = 0   ww   = 0   lwn   = 1   wwn   = 1

+lwl   = 0   wwl   = 0   xpart = 0

+k2   = 0.01   k3   = 0

+k3b   = 0   w0   = 2.5e-006   dvt0   = 1   dvt1   = 2

+dvt2   = -0.032   dvt0w = 0   dvt1w = 0   dvt2w = 0

+dsub   = 0.1   minv   = 0.05   voffl = 0   dvtp0 = 1.0e-009

+dvtp1 = 0.1   lpe0   = 0   lpeb   = 0

+ngate = 2e+020   nsd   = 2e+020   phin   = 0

+cdsc   = 0.000   cdscb = 0   cdscd = 0   cit   = 0

+voff   = -0.13   etab   = 0

+vfb   = -0.55   ua   = 6e-010   ub   = 1.2e-018

+uc   = 0   a0   = 1.0   ags   = 1e-020

+a1   = 0   a2   = 1.0   b0   = 0   b1   = 0

+keta   = 0.04   dwg   = 0   dwb   = 0   pclm   = 0.04

+pdiblc1 = 0.001   pdiblc2 = 0.001   pdiblcb = -0.005   drout = 0.5

+pvag   = 1e-020   delta = 0.01   pscbe1 = 8.14e+008   pscbe2 = 1e-007

+fprout = 0.2   pdits = 0.08   pditsd = 0.23   pditsl = 2.3e+006

+rsh   = 5   rsw   = 85   rdw   = 85

+rdswmin = 0   rdwmin = 0   rswmin = 0   prwg   = 0

+prwb = 6.8e-011   wr   = 1   alpha0 = 0.074   alpha1 = 0.005

+beta0 = 30   agidl = 0.0002   bgidl = 2.1e+009   cgidl = 0.0002

+egidl = 0.8

+aigbacc = 0.012   bigbacc = 0.0028   cigbacc = 0.002

+nigbacc = 1   aigbinv = 0.014   bigbinv = 0.004   cigbinv = 0.004

+eigbinv = 1.1   nigbinv = 3   aigc   = 0.012   bigc   = 0.0028

+cigc   = 0.002   aigsd = 0.012   bigsd = 0.0028   cigsd = 0.002

+nigc   = 1   poxedge = 1   pigcd = 1   ntox   = 1

+xrcrg1 = 12   xrcrg2 = 5

+cgbo   = 2.56e-011   cgdl   = 2.653e-10

+cgsl = 2.653e-10   ckappas = 0.03   ckappad = 0.03   acde   = 1

+moin   = 15   noff = 0.9   voffcv = 0.02

+kt1   = -0.11   kt1l = 0   kt2   = 0.022   ute   = -1.5

+ua1   = 4.31e-009   ub1   = 7.61e-018   uc1   = -5.6e-011   prt   = 0

+at   = 33000

+fnoimod = 1   tnoimod = 0

+jss   = 0.0001   jsws   = 1e-011   jswgs = 1e-010   njs   = 1

+ijthsfwd= 0.01   ijthsrev= 0.001   bvs   = 10   xjbvs = 1

+jsd   = 0.0001   jswd   = 1e-011   jswgd = 1e-010   njd   = 1

+ijthdfwd= 0.01   ijthdrev= 0.001   bvd   = 10   xjbvd = 1

+pbs   = 1   cjs   = 0.0005   mjs   = 0.5   pbsws = 1

+cjsws = 5e-010   mjsws = 0.33   pbswgs = 1   cjswgs = 3e-010

+mjswgs = 0.33   pbd   = 1   cjd   = 0.0005   mjd   = 0.5

+pbswd = 1   cjswd = 5e-010   mjswd = 0.33   pbswgd = 1

+cjswgd = 5e-010   mjswgd = 0.33   tpb   = 0.005   tcj   = 0.001

+tpbsw = 0.005   tcjsw = 0.001   tpbswg = 0.005   tcjswg = 0.001

+xtis   = 3   xtid   = 3

+dmcg   = 0e-006   dmci   = 0e-006   dmdg   = 0e-006   dmcgt = 0e-007

+dwj   = 0.0e-008   xgw   = 0e-007   xgl   = 0e-008

+rshg   = 0.4   gbmin = 1e-010   rbpb   = 5   rbpd   = 15

+rbps   = 15   rbdb   = 15   rbsb   = 15   ngcon = 1

.model pmos pmos level = 54

+version = 4.0   binunit = 1   paramchk= 1   mobmod = 0

+capmod = 2   igcmod = 1   igbmod = 1   geomod = 1

+diomod = 1   rdsmod = 0   rbodymod= 1   rgatemod= 1

+permod = 1   acnqsmod= 0   trnqsmod= 0

* parameters related to the technology node

+tnom = 27   epsrox = 3.9

+eta0 = 0.0049   nfactor = 2.1   wint = 5e-09

+cgso = 1.1e-10   cgdo = 1.1e-10   xl = -2e-08

* parameters customized by the user

+toxe = 1.85e-09   toxp = 1.1e-09   toxm = 1.85e-09   toxref = 1.85e-09

+dtox = 7.5e-10   lint = 3.75e-09

+vth0 = -0.418   k1 = 0.488   u0 = 0.00439   vsat = 70000

+rdsw = 155   ndep = 2.5e+18   xj = 1.4e-08

*secondary parameters

+ll   = 0   wl   = 0   lln   = 1   wln   = 1

+lw   = 0   ww   = 0   lwn   = 1   wwn   = 1

+lwl   = 0   wwl   = 0   xpart = 0

+k2   = -0.01   k3   = 0

+k3b   = 0   w0   = 2.5e-006   dvt0   = 1   dvt1   = 2

+dvt2   = -0.032   dvt0w = 0   dvt1w = 0   dvt2w = 0

+dsub   = 0.1   minv   = 0.05   voffl = 0   dvtp0 = 1e-009

+dvtp1 = 0.05   lpe0   = 0   lpeb   = 0

+ngate = 2e+020   nsd   = 2e+020   phin   = 0

+cdsc   = 0.000   cdscb = 0   cdscd = 0   cit   = 0

+voff   = -0.126   etab   = 0

+vfb   = 0.55   ua   = 2.0e-009 ub   = 0.5e-018

+uc   = 0   a0   = 1.0   ags   = 1e-020

+a1   = 0   a2   = 1   b0   = -1e-020   b1   = 0

+keta   = -0.047   dwg   = 0   dwb   = 0   pclm   = 0.12

+pdiblc1 = 0.001   pdiblc2 = 0.001   pdiblcb = 3.4e-008   drout = 0.56

+pvag   = 1e-020   delta = 0.01   pscbe1 = 8.14e+008   pscbe2 = 9.58e-007

+fprout = 0.2   pdits = 0.08   pditsd = 0.23   pditsl = 2.3e+006

+rsh   = 5   rsw   = 85   rdw   = 85

+rdswmin = 0   rdwmin = 0   rswmin = 0   prwg   = 3.22e-008

+prwb   = 6.8e-011 wr   = 1   alpha0 = 0.074   alpha1 = 0.005

+beta0 = 30   agidl = 0.0002   bgidl = 2.1e+009   cgidl = 0.0002

+egidl = 0.8

+aigbacc = 0.012   bigbacc = 0.0028   cigbacc = 0.002

+nigbacc = 1   aigbinv = 0.014   bigbinv = 0.004   cigbinv = 0.004

+eigbinv = 1.1   nigbinv = 3   aigc   = 0.69   bigc   = 0.0012

+cigc   = 0.0008   aigsd = 0.0087   bigsd = 0.0012   cigsd = 0.0008

+nigc   = 1   poxedge = 1   pigcd = 1   ntox   = 1

+xrcrg1 = 12   xrcrg2 = 5

+cgbo   = 2.56e-011 cgdl   = 2.653e-10

+cgsl   = 2.653e-10 ckappas = 0.03   ckappad = 0.03   acde   = 1

+moin   = 15   noff   = 0.9   voffcv = 0.02

+kt1   = -0.11   kt1l   = 0   kt2   = 0.022   ute   = -1.5

+ua1   = 4.31e-009 ub1   = 7.61e-018 uc1   = -5.6e-011   prt   = 0

+at   = 33000

+fnoimod = 1   tnoimod = 0

+jss   = 0.0001   jsws   = 1e-011   jswgs = 1e-010   njs   = 1
+ijthsfwd= 0.01   ijthsrev= 0.001   bvs   = 10   xjbvs = 1
+jsd   = 0.0001   jswd   = 1e-011   jswgd = 1e-010   njd   = 1
+ijthdfwd= 0.01   ijthdrev= 0.001   bvd   = 10   xjbvd = 1
+pbs   = 1   cjs   = 0.0005   mjs   = 0.5   pbsws = 1
+cjsws = 5e-010   mjsws = 0.33   pbswgs = 1   cjswgs = 3e-010
+mjswgs = 0.33   pbd   = 1   cjd   = 0.0005   mjd   = 0.5
+pbswd = 1   cjswd = 5e-010   mjswd = 0.33   pbswgd = 1
+cjswgd = 5e-010   mjswgd = 0.33   tpb   = 0.005   tcj   = 0.001
+tpbsw = 0.005   tcjsw = 0.001   tpbswg = 0.005   tcjswg = 0.001
+xtis   = 3   xtid   = 3

+dmcg   = 0e-006   dmci   = 0e-006   dmdg   = 0e-006   dmcgt = 0e-007
+dwj   = 0.0e-008   xgw   = 0e-007   xgl   = 0e-008

+rshg   = 0.4   gbmin = 1e-010   rbpb   = 5   rbpd   = 15
+rbps   = 15   rbdb   = 15   rbsb   = 15   ngcon = 1

.options POST=2

.options AUTOSTOP

.options INGOLD=2 DCON=1

.options GSHUNT=1e-12 RMIN=1e-15

.options ABSTOL=1e-5 ABSVDC=1e-4

.options RELTOL=1e-2 RELVDC=1e-2

.options NUMDGT=4 PIVOT=13

.options runlvl=6

.end

THE END