Report-12

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TABLE I: Effect of Trojan model I

171BEE 1. Effect of Trojan model 1						
Q	T1	T2	Data on bus	Outcome	File name	Remark
0	0	0	0	Stored Value	First.sp	Read 0, Same
0	0	1	Discharge from both BL and BLb	Read Error	Second.sp	Read Error, Same
0	1	0	No charge loss from BL and BLb	Read Error	Third.sp	Read 0, Not Same
0	1	1	1	Trojan Effected	Four.sp	Read 1, Same
1	0	0	1	Stored Value	Five.sp	Read 1, Same
1	0	1	1	Stored Value	Six.sp	Read 1, Same
1	1	0	1	Stored Value	Seven.sp	Read 1, Same
1	1	1	1	Stored Value	Eight.sp	Read 1, Same

In below I show the deference Trojan Effected stage and without Trojan stage.

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 = 42
02	elements = 8	elements = 10
03	mosfets = 6	mosfets = 8
04	volt_srcs = 2	volt_srcs = 2

4. Without Trojan:

```
***** Runtime Statistics (seconds) ******
                      # points tot. iter
 analysis
               time
                                              conv.iter
 op point
               0.00
                           1
                                  23
 transient
               0.01
                         201
                                  655
                                            125 \text{ rev} = 13
 readin
               0.03
 errchk
               0.01
                0.00
 setup
               0.00
 output
      peak memory used
                              48.61 megabytes
```

total cpu time 0.02 seconds total elapsed time 0.21 seconds

With Trojan:

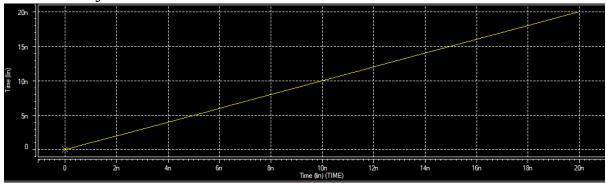
***** Runtime Statistics (seconds) *****						
analysis	time	# points	tot. iter	conv.iter		
op point	0.00	1	23			
transient	0.02	201	2104	313 rev=	103	
readin	0.01					
errchk	0.00					
setup	0.00					
output	0.00					
peak memory used			48.68 megabytes			
total any time			0.07 secon	de		

total cpu time 48.68 megabytes
total cpu time 0.07 seconds
total elapsed time 0.29 seconds

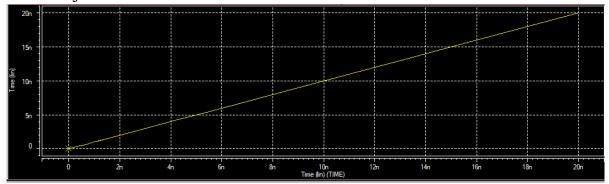
Graph Difference

1. Time

Without Trojan:



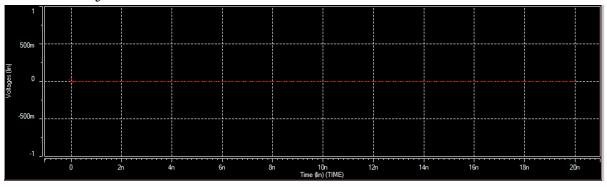
With Trojan:



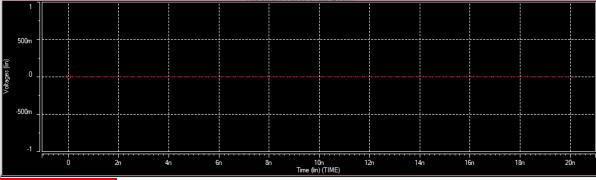
Remarks: Same

2. Voltage [v(0)]

Without Trojan:

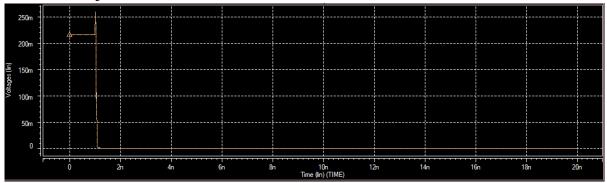


With Trojan:

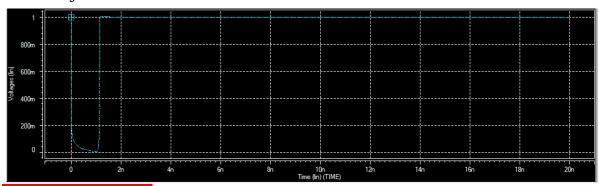


3. Voltage [v(bl)]

Without Trojan:



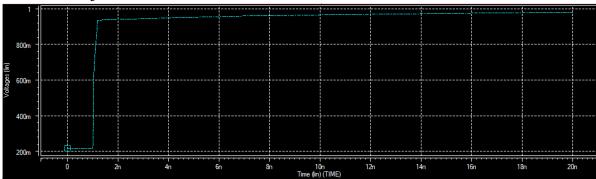
With Trojan:



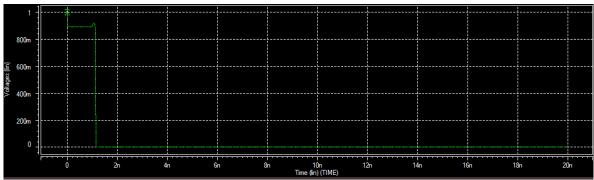
Remarks: Not Same

4. Voltage [v(blb)]

Without Trojan:



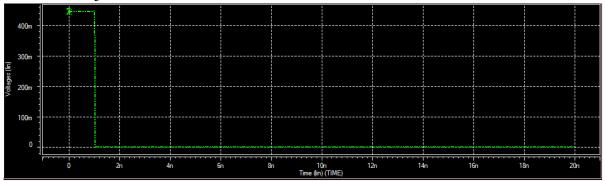
With Trojan:



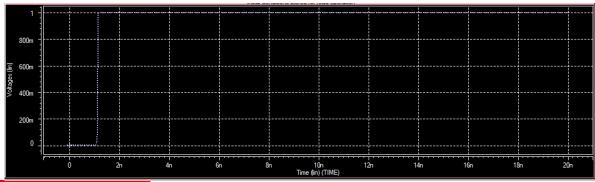
Remarks: Not Same

5. Voltage [v(q)]

Without Trojan:



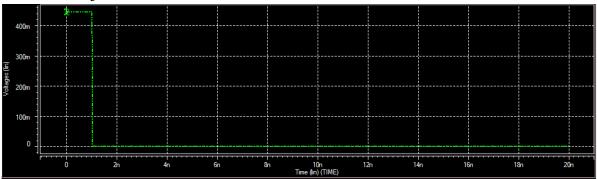
With Trojan:



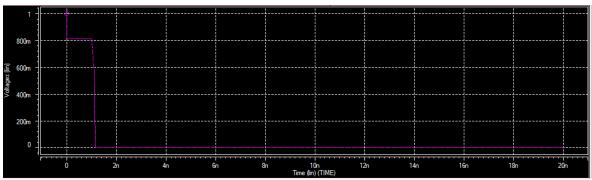
Remarks: Not Same

6. Voltage [v(qr)]

Without Trojan:

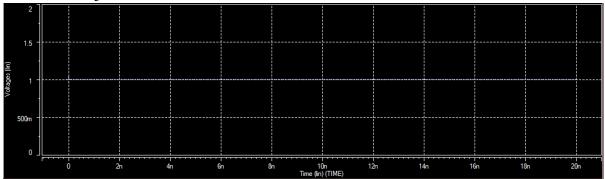


With Trojan:

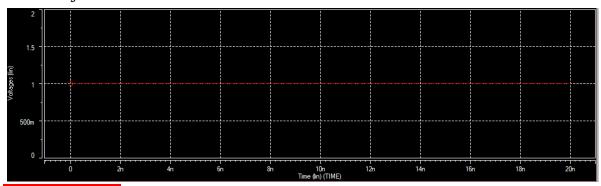


7. Voltage [v(vdd)]

Without Trojan:



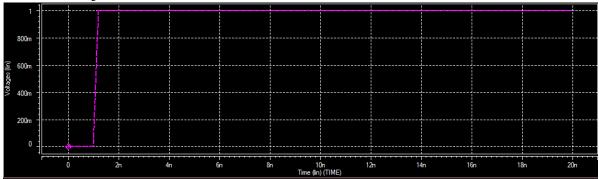
With Trojan:



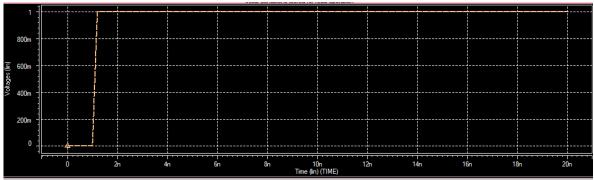
Remarks: Same

8. Voltage [v(wl)]

Without Trojan:

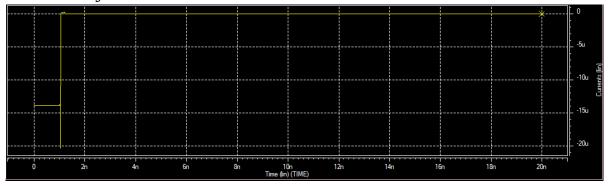


With Trojan:

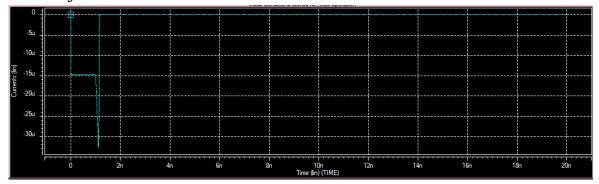


9. Current [i(vvdd)]

Without Trojan:



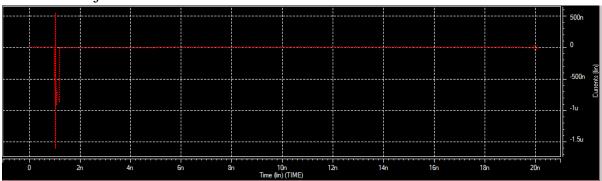
With Trojan:



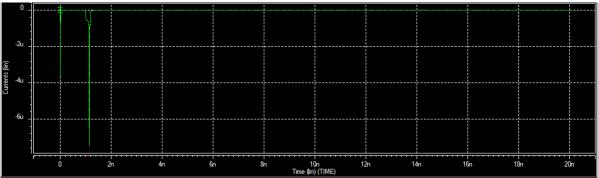
Remarks: Same

10.Current [i(vwl)]

Without Trojan:

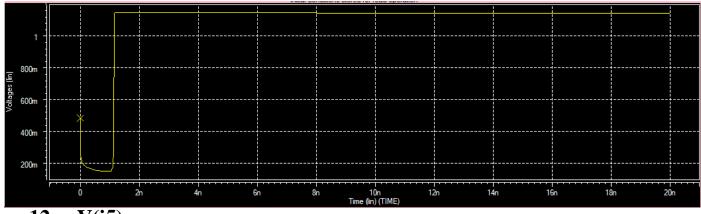


With Trojan:

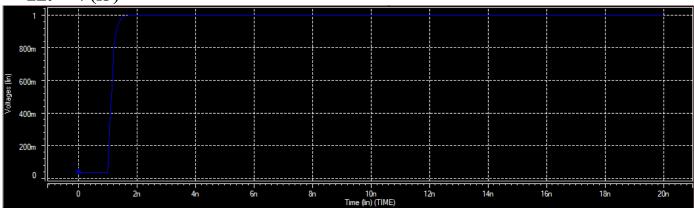


Some voltage which show only with Trojan SRAM

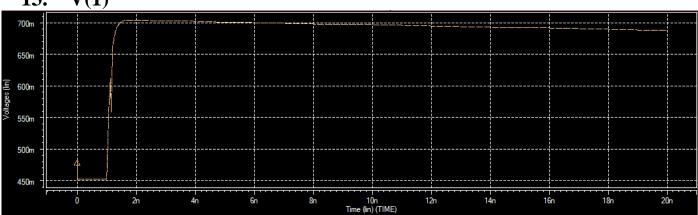








13. V(1)



Netlist Without Trojan

```
*initial conditions stored for read operation
ic v(Q)=1
ic v(QR)=0
*data control
ic v(bl)=1
ic v(blb)=1
** SRAM without 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
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
+11
     =0
               wl
                    =0
                             lln = 1
                                           wln
                                                 = 1
+lw
      = 0
               \mathbf{w}\mathbf{w}
                      =0
                               lwn = 1
                                              wwn
                                                    = 1
+lwl
      =0
               wwl = 0
                               xpart = 0
      = 0.01
+k2
                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
                                 cdscd = 0
+cdsc = 0.000
                 cdscb = 0
                                                 cit = 0
+voff = -0.13
                 etab = 0
+vfb
     = -0.55
                      = 6e-010
                                 ub = 1.2e-018
                 ua
                              ags = 1e-020
                    = 1.0
+uc
      =0
               a0
                    = 1.0
                              b0
                                    = 0
                                             b1
+a1
      =0
               a2
+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 \quad pscbe2 = 1e-007
+fprout = 0.2
                 pdits = 0.08
                                 pditsd = 0.23
                                                 pdits1 = 2.3e + 006
               rsw = 85
+rsh = 5
                               rdw = 85
                  rdwmin = 0
+rdswmin = 0
                                   rswmin = 0
                                                    prwg = 0
+prwb = 6.8e-011 wr
                         = 1
                                  alpha0 = 0.074
                                                    alpha1 = 0.005
+beta0 = 30
                 agid1 = 0.0002
                                  bgidl = 2.1e+009 cgidl = 0.0002
+egidl = 0.8
+aigbacc = 0.012
                   bigbacc = 0.0028
                                     cigbacc = 0.002
                 aigbinv = 0.014
+nigbacc = 1
                                   bigbinv = 0.004
                                                     cigbinv = 0.004
                                  aigc = 0.012
                                                  bigc = 0.0028
+eigbinv = 1.1
                 nigbinv = 3
+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
                kt11 = 0
                               kt2
                                    = 0.022
                                                   = -1.5
                                               ute
     = 4.31e-009 ub1 = 7.61e-018 uc1 = -5.6e-011 prt = 0
+ua1
+at
     = 33000
                  tnoimod = 0
+fnoimod = 1
                                  jswgs = 1e-010
+iss
     = 0.0001
                 jsws = 1e-011
                                                    nis = 1
+ijthsfwd = 0.01
                  iithsrev=0.001
                                                   xibvs = 1
                                   bvs = 10
+isd = 0.0001
                 iswd = 1e-011
                                   iswgd = 1e-010
                                                     nid = 1
+ijthdfwd = 0.01
                  ijthdrev=0.001
                                    bvd = 10
                                                   xibvd = 1
                                               pbsws = 1
+pbs = 1
               cis = 0.0005
                                mis = 0.5
+cisws = 5e-010
                  misws = 0.33
                                    pbswgs = 1
                                                    ciswgs = 3e-010
+mjswgs = 0.33
                  pbd = 1
                                  cid = 0.0005
                                                  mid = 0.5
+pbswd = 1
                 ciswd = 5e-010
                                   mjswd = 0.33
                                                     pbswgd = 1
                                                     tci = 0.001
+ciswgd = 5e-010
                   mjswgd = 0.33
                                     tpb = 0.005
                                   tpbswg = 0.005
+tpbsw = 0.005
                  tcisw = 0.001
                                                     tcjswg = 0.001
+xtis = 3
               xtid = 3
+dmcg = 0e-006
                   dmci = 0e-006
                                     dmdg = 0e-006
                                                       dmcgt = 0e-007
+dwi = 0.0e-008
                 xgw = 0e-007
                                    xg1 = 0e-008
                                   rbpb = 5
+rshg = 0.4
                gbmin = 1e-010
                                                  rbpd = 15
                rbdb = 15
                                rbsb = 15
                                                ngcon = 1
+rbps = 15
.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
+11
     =0
              wl
                   =0
                             lln = 1
                                           wln
                                                = 1
+lw
      = 0
               \mathbf{w}\mathbf{w}
                     =0
                              lwn = 1
                                              wwn
                                                   = 1
+lwl
      =0
               wwl = 0
                               xpart = 0
      = -0.01
+k2
                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
                                 cdscd = 0
+cdsc = 0.000
                 cdscb = 0
                                                cit = 0
+voff = -0.126
                 etab = 0
+vfb
     = 0.55
                      = 2.0e-009
                                 ub = 0.5e-018
                ua
+uc
      =0
               a0
                    = 1.0
                              ags = 1e-020
                    = 1
                                   = -1e-020
+a1
      =0
               a2
                             b0
                                              b1
                 dwg = 0
                                 dwb = 0
+keta = -0.047
                                                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 \quad pscbe2 = 9.58e-007
+fprout = 0.2
                pdits = 0.08
                                 pditsd = 0.23
                                                 pdits1 = 2.3e + 006
               rsw = 85
+rsh = 5
                              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
                 agid1 = 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
```

```
noff = 0.9
+moin = 15
                                voffcv = 0.02
                                    = 0.022
+kt1
      = -0.11
                kt11 = 0
                               kt2
                                               ute
                                                   = -1.5
      = 4.31e-009 ub1 = 7.61e-018 uc1 = -5.6e-011 prt
+ua1
+at
     = 33000
+fnoimod = 1
                 tnoimod = 0
                 jsws = 1e-011
                                  jswgs = 1e-010
+jss
     = 0.0001
                                                   njs
                                                        = 1
+ijthsfwd = 0.01
                  ijthsrev=0.001
                                       = 10
                                                  xibvs = 1
                                   bvs
+jsd
     = 0.0001
                 jswd = 1e-011
                                  jswgd = 1e-010
                                                    njd
                                                        = 1
                                                   xibvd = 1
+ijthdfwd = 0.01
                  ijthdrev=0.001
                                   bvd = 10
               cis = 0.0005
                               mis = 0.5
                                               pbsws = 1
     = 1
+pbs
                  mjsws = 0.33
+cjsws = 5e-010
                                   pbswgs = 1
                                                    ciswgs = 3e-010
                                 cid = 0.0005
+mjswgs = 0.33
                  pbd = 1
                                                  mid = 0.5
+pbswd = 1
                 ciswd = 5e-010
                                   miswd = 0.33
                                                    pbswgd = 1
+cjswgd = 5e-010
                   mjswgd = 0.33
                                     tpb = 0.005
                                                     tci = 0.001
                  tcjsw = 0.001
                                   tpbswg = 0.005
+tpbsw = 0.005
                                                     tcjswg = 0.001
+xtis = 3
               xtid = 3
+dmcg = 0e-006
                   dmci = 0e-006
                                    dmdg = 0e-006
                                                      dmcgt = 0e-007
+dwi = 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

- *initial conditions stored for read operation
- ic v(Q)=0
- .ic v(QR)=1
- *data control
- .ic v(bl)=1
- .ic v(blb)=1
- ** 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 I=45n

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

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

MT i5 1 wl wl pmos w=90n l=45n

MTr QR 1 0 0 nmos w=90n l=45n

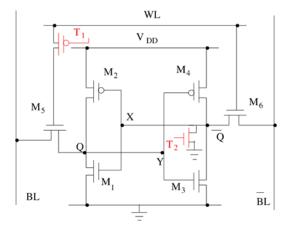
** Voltage source

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
- +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
   = 0
+||
             wl
                 = 0
                          lln = 1
                                       wln = 1
+lw = 0
                  = 0
                            lwn = 1
              ww
                                          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
                                   = 1.2e-018
                    = 6e-010
                               ub
               ua
+uc
     = 0
              a0
                   = 1.0
                            ags = 1e-020
              a2 = 1.0
+a1
     = 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
                                bgidl = 2.1e+009 cgidl = 0.0002
                agidl = 0.0002
+egidl = 0.8
+aigbacc = 0.012
                 bigbacc = 0.0028
                                   cigbacc = 0.002
                aigbinv = 0.014
                                 bigbinv = 0.004
                                                  cigbinv = 0.004
+nigbacc = 1
+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
               noff = 0.9
                          voffcv = 0.02
+moin = 15
+kt1 = -0.11
                           kt2 = 0.022
              kt1l = 0
                                         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
                                              nis = 1
+ijthsfwd= 0.01
             ijthsrev= 0.001 bvs = 10
                                             xjbvs = 1
+jsd = 0.0001 jswd = 1e-011 jswgd = 1e-010
                                               nid = 1
+ijthdfwd= 0.01
              ijthdrev= 0.001
                                bvd = 10
                                              xjbvd = 1
             cjs = 0.0005
+pbs = 1
                            mjs = 0.5
                                         pbsws = 1
                                pbswgs = 1
+cjsws = 5e-010 mjsws = 0.33
                                              cjswgs = 3e-010
                             cjd = 0.0005 \quad mjd = 0.5
+mjswgs = 0.33
              pbd = 1
               cjswd = 5e-010 mjswd = 0.33
+pbswd = 1
                                               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
                               dmdg = 0e-006 dmcgt = 0e-007
+dmcg = 0e-006
                 dmci = 0e-006
+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 acngsmod= 0 trngsmod= 0
* parameters related to the technology node
+tnom = 27 epsrox = 3.9
+eta0 = 0.0049 nfactor = 2.1 wint = 5e-09
```

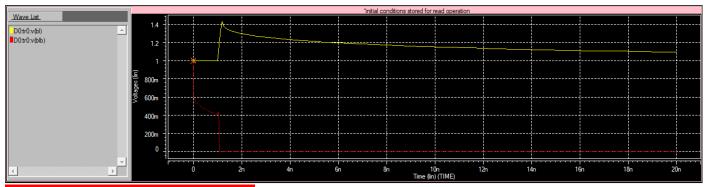
```
+cgso = 1.1e-10 cgdo = 1.1e-10 xl = -2e-08
* parameters customized by the user
+toxe = 1.85e-09 toxp = 1.1e-09 toxm = 1.85e-09 toxref = 1.85e-09
+dtox = 7.5e-10 lint = 3.75e-09
+vth0 = -0.418 k1 = 0.488 u0 = 0.00439 vsat = 70000
+rdsw = 155 ndep = 2.5e+18 xj = 1.4e-08
*secondary parameters
                          lln = 1
             wl = 0
+||
    = 0
                                       wln = 1
+lw
     = 0
                  = 0
                            lwn = 1
                                          wwn = 1
              ww
              wwl = 0
                            xpart = 0
+lwl = 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
                lpe0 = 0
+dvtp1 = 0.05
                               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
                           b0
                                = -1e-020
+a1
     = 0
              a2
                  = 1
                                           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
                                bgidl = 2.1e+009 cgidl = 0.0002
                agidl = 0.0002
+egidl = 0.8
                  bigbacc = 0.0028
+aigbacc = 0.012
                                    cigbacc = 0.002
                                 bigbinv = 0.004
+nigbacc = 1
                aigbinv = 0.014
                                                  cigbinv = 0.004
```

```
aigc = 0.69 bigc = 0.0012
+eigbinv = 1.1
               nigbinv = 3
               aigsd = 0.0087
                                bigsd = 0.0012 cigsd = 0.0008
+cigc = 0.0008
+nigc = 1
             poxedge = 1
                             pigcd = 1
                                           ntox = 1
               xrcrg2 = 5
+xrcrg1 = 12
+cgbo = 2.56e-011 cgdl = 2.653e-10
+cgsl = 2.653e-10 ckappas = 0.03 ckappad = 0.03
                                                  acde = 1
               noff = 0.9
+moin = 15
                            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
+miswgs = 0.33
                pbd = 1
                              cjd = 0.0005 \quad mjd = 0.5
               cjswd = 5e-010 mjswd = 0.33
+pbswd = 1
                                                pbswgd = 1
+cjswgd = 5e-010 mjswgd = 0.33
                                  tpb = 0.005
                                                tcj = 0.001
                                tpbswg = 0.005
+tpbsw = 0.005
                tcjsw = 0.001
                                                tcjswg = 0.001
+xtis = 3
             xtid = 3
+dmcg = 0e-006
                 dmci = 0e-006
                                dmdg = 0e-006 \quad dmcgt = 0e-007
+dwj = 0.0e-008 \quad xgw = 0e-007
                                xgl = 0e-008
+rshg = 0.4
              gbmin = 1e-010
                               rbpb = 5
                                             rbpd = 15
              rbdb = 15
+rbps = 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

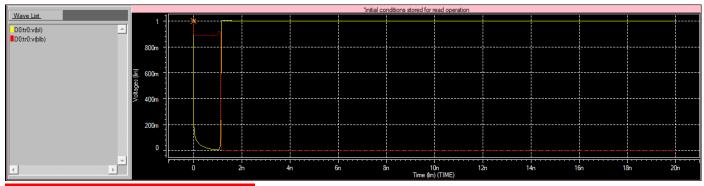
Result for read

Without Trojan:



Remark: Successfully read 1

With Trojan:



Remark: Successfully read 1.

THE END