

MOSIS PARAMETRIC TEST RESULTS

RUN: T17B
 TECHNOLOGY: SCN025

VENDOR: TSMC
 FEATURE SIZE: 0.25 microns

INTRODUCTION: This report contains the lot average results obtained by MOSIS from measurements of MOSIS test structures on each wafer of this fabrication lot. SPICE parameters obtained from similar measurements on a selected wafer are also attached.

COMMENTS: TSMC 0251P5M

| TRANSISTOR PARAMETERS | W/L | N-CHANNEL | P-CHANNEL | UNITS |
|-----------------------|-----------|-----------|-----------|----------|
| MINIMUM Vth | 0.36/0.24 | 0.50 | -0.46 | volts |
| SHORT Idss | 20.0/0.24 | 620 | -308 | uA/um |
| Vth | | 0.51 | -0.49 | volts |
| Vpt | | 7.6 | -7.4 | volts |
| WIDE Ids0 | 20.0/0.24 | 10.3 | -17.8 | pA/um |
| LARGE Vth | 50/50 | 0.44 | -0.58 | volts |
| Vjbkd | | 6.0 | -7.1 | volts |
| Ijlk | | <50.0 | <50.0 | pA |
| Gamma | | 0.45 | 0.61 | V^0.5 |
| K' (Uo*Cox/2) | | 117.9 | -24.8 | uA/V^2 |
| Low-field Mobility | | 396.07 | 83.31 | cm^2/V*s |

COMMENTS: Poly bias varies with design technology. To account for mask and etch bias use the appropriate value for the parameters XL and XW in your SPICE model card.

| Design Technology | XL | XW |
|--------------------------|-------|-------|
| SCN5M_DEEP (lambda=0.12) | 0.03 | -0.04 |
| thick oxide, NMOS | 0.02 | -0.04 |
| thick oxide, PMOS | -0.03 | -0.04 |
| TSMC25 | 0.03 | 0.00 |
| thick oxide, NMOS | 0.03 | 0.00 |
| thick oxide, PMOS | 0.03 | 0.00 |
| SCN5M_SUBM (lambda=0.15) | -0.03 | 0.00 |
| thick oxide, NMOS | 0.02 | 0.00 |
| thick oxide, PMOS | -0.03 | 0.00 |

| FOX TRANSISTORS | GATE | N+ACTIVE | P+ACTIVE | UNITS |
|-----------------|------|----------|----------|-------|
| Vth | Poly | >6.6 | <-6.6 | volts |

| PROCESS PARAMETERS | N+ACTV | P+ACTV | POLY | N+BLK | PLY+BLK | MTL1 | MTL2 | UNITS |
|----------------------|--------|--------|------|-------|---------|------|------|----------|
| Sheet Resistance | 3.7 | 3.0 | 3.4 | 57.4 | 166.6 | 0.07 | 0.07 | ohms/sq |
| Contact Resistance | 5.2 | 4.6 | 4.5 | | | | 2.38 | ohms |
| Gate Oxide Thickness | 58 | | | | | | | angstrom |

| PROCESS PARAMETERS | MTL3 | MTL4 | MTL5 | N_WELL | UNITS |
|--------------------|------|------|-------|--------|---------|
| Sheet Resistance | 0.07 | 0.07 | 0.04 | 1096 | ohms/sq |
| Contact Resistance | 4.78 | 7.69 | 11.16 | | ohms |

COMMENTS: BLK is silicide block.

| CAPACITANCE PARAMETERS | N+ACTV | P+ACTV | POLY | M1 | M2 | M3 | M4 | M5 | N_WELL | UNITS |
|------------------------|--------|--------|------|----|----|----|----|----|--------|--------------------|
| Area (substrate) | 1660 | 1832 | 96 | 34 | 15 | 9 | 5 | 4 | 59 | aF/um ² |
| Area (N+active) | | | 5940 | 50 | 20 | 14 | 11 | 9 | | aF/um ² |
| Area (P+active) | | | 5710 | | | | | | | aF/um ² |
| Area (poly) | | | | 61 | 17 | 10 | 7 | 6 | | aF/um ² |
| Area (metal1) | | | | | 38 | 15 | 10 | 7 | | aF/um ² |
| Area (metal2) | | | | | | 39 | 15 | 9 | | aF/um ² |
| Area (metal3) | | | | | | | 37 | 15 | | aF/um ² |
| Area (metal4) | | | | | | | | 41 | | aF/um ² |
| Area (no well) | 970 | | | | | | | | | aF/um ² |
| Fringe (substrate) | 399 | 323 | | 2 | 40 | 36 | 21 | -- | | aF/um |
| Fringe (poly) | | | | 70 | 41 | 31 | 24 | 21 | | aF/um |
| Fringe (metal1) | | | | | 54 | 37 | | 24 | | aF/um |
| Fringe (metal2) | | | | | | 50 | 36 | 29 | | aF/um |
| Fringe (metal3) | | | | | | | 52 | 37 | | aF/um |
| Fringe (metal4) | | | | | | | | 56 | | aF/um |
| Overlap (N+active) | | | 562 | | | | | | | aF/um |
| Overlap (P+active) | | | 630 | | | | | | | aF/um |

| CIRCUIT PARAMETERS | | | UNITS |
|-------------------------|-----|--------|-------------|
| Inverters | K | | |
| Vinv | 1.0 | 1.03 | volts |
| Vinv | 1.5 | 1.12 | volts |
| Vol (100 uA) | 2.0 | 0.20 | volts |
| Voh (100 uA) | 2.0 | 2.09 | volts |
| Vinv | 2.0 | 1.19 | volts |
| Gain | 2.0 | -14.55 | |
| Ring Oscillator Freq. | | | |
| D1024_THK (31-stg,3.3V) | | 220.95 | MHz |
| DIV1024 (31-stg,2.5V) | | 287.49 | MHz |
| Ring Oscillator Power | | | |
| D1024_THK (31-stg,3.3V) | | 0.09 | uW/MHz/gate |
| DIV1024 (31-stg,2.5V) | | 0.06 | uW/MHz/gate |

COMMENTS: DEEP_SUBMICRON

T17B SPICE BSIM3 VERSION 3.1 PARAMETERS

SPICE 3f5 Level 8, Star-HSPICE Level 49, UTMOST Level 8

* DATE: Sep 4/01

* LOT: T17B

WAF: 3010

* Temperature_parameters=Default

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.MODEL CMOSN NMOS (
+VERSION = 3.1          TNOM    = 27          LEVEL  = 49
+XJ      = 1E-7         NCH    = 2.3549E17      TOX    = 5.8E-9
+K1      = 0.477867     K2     = 2.422759E-3   VTH0   = 0.3819327
+K3B     = 2.1606637    W0     = 1E-7         K3     = 1E-3
+DVT0W   = 0           DVT1W  = 0           NLX    = 1.579864E-7
+DVT0    = 0.5334651   DVT1   = 0.7186877   DVT2W  = 0
+U0      = 289.1720829 UA     = -1.300598E-9  DVT2   = -0.5
+UC      = 2.841618E-11 VSAT   = 1.482651E5    UB     = 2.308197E-18
+AGS     = 0.2874763   B0     = -1.833193E-8 A0     = 1.6856991
+KETA    = -2.395348E-3 A1     = 0           B1     = -1E-7
+RDSW    = 178.7751373 PRWG   = 0.3774172   A2     = 0.4177975
+WR      = 1           WINT   = 0           PRWB   = -0.2
+XL      = 3E-8        XW     = -4E-8       LINT   = 1.888394E-8
+DWB     = 4.613042E-9 VOFF   = -0.0981658  DWG    = -1.213938E-8
+CIT     = 0           CDSC   = 2.4E-4       NFACTOR = 1.2032376
+CDSCB   = 0          ETA0   = 5.128492E-3  CDSCD  = 0
+DSUB    = 0.0463218  PCLM   = 1.91946     ETAB   = 6.18609E-4
+PDIBLC2 = 4.422611E-3 PDIBLCB = -0.1        PDIBLC1 = 1
+PSCBE1  = 7.982649E10 PSCBE2 = 5.200359E-10 DROUT  = 0.9817908
+DELTA   = 0.01       RSH    = 3.7         PVAG   = 9.314435E-3
+PRT     = 0           UTE    = -1.5        MOBMOD = 1
+KT1L    = 0          KT2    = 0.022       KT1    = -0.11
+UB1     = -7.61E-18  UC1    = -5.6E-11   UA1    = 4.31E-9
+WL      = 0          WLN    = 1           AT     = 3.3E4
+WWN     = 1          WWL    = 0           WW     = 0
+LLN     = 1          LW     = 0           LL     = 0
+LWL     = 0          CAPMOD = 2           LWN    = 1
+CGDO    = 5.62E-10   CGSO   = 5.62E-10   XPART  = 0.5
+CJ      = 1.641005E-3 PB     = 0.99        CGBO   = 1E-12
+CJSW    = 4.179682E-10 PBSW   = 0.99        MJ     = 0.4453094
+CJSWG   = 3.29E-10  PBSWG  = 0.99        MJSW  = 0.3413857
+CF      = 0          PVTH0  = -8.385037E-3 MJSWG  = 0.3413857
+PK2     = 2.650965E-3 WKETA  = 7.293869E-3 PRDSW  = -10
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.MODEL CMOSP PMOS (
+VERSION = 3.1          TNOM    = 27          LEVEL  = 49
+XJ      = 1E-7         NCH    = 4.1589E17      TOX    = 5.8E-9
+K1      = 0.6266074    K2     = 1.651948E-3   VTH0   = -0.5739762
+K3B     = 8.1786329    W0     = 1E-6         K3     = 0
+DVT0W   = 0           DVT1W  = 0           NLX    = 1E-9
+DVT0    = 2.9123268   DVT1   = 0.6575827   DVT2W  = 0
+U0      = 102.5675612 UA     = 1.025046E-9   DVT2   = -0.2496367
+UC      = -1E-10      VSAT   = 2E5         UB     = 1E-21
+AGS     = 0           B0     = 1.871134E-6  A0     = 0.6132777
+KETA    = 0.0202204   A1     = 7.071317E-4  B1     = 5E-6
+RDSW    = 491.7112485 PRWG   = 0.5         A2     = 0.3
+WR      = 1           WINT   = 0           PRWB   = -0.1854575
+XL      = 3E-8        XW     = -4E-8       LINT   = 4.226186E-8
+DWB     = 4.379169E-9 VOFF   = -0.0582608  DWG    = -3.005827E-8
+CIT     = 0           CDSC   = 2.4E-4       NFACTOR = 2
+CDSCB   = 0          ETA0   = 0.5327788     CDSCD  = 0
+DSUB    = 1.056684    PCLM   = 1.256267    ETAB   = -0.4499824
+PDIBLC2 = 2.621289E-5 PDIBLCB = -1E-3        PDIBLC1 = 6.875718E-3
+PSCBE1  = 1.765896E10 PSCBE2 = 1.433018E-9  DROUT  = 0.0785892
+DELTA   = 0.01       RSH    = 3           PVAG   = 0.0149955
+PRT     = 0           UTE    = -1.5        MOBMOD = 1
+KT1L    = 0          KT2    = 0.022       KT1    = -0.11
)

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| | | | | | | | | |
|--------|---|--------------|--------|---|-------------|-------|---|-------------|
| +UB1 | = | -7.61E-18 | UC1 | = | -5.6E-11 | AT | = | 3.3E4 |
| +WL | = | 0 | WLN | = | 1 | WW | = | 0 |
| +WWN | = | 1 | WWL | = | 0 | LL | = | 0 |
| +LLN | = | 1 | LW | = | 0 | LWN | = | 1 |
| +LWL | = | 0 | CAPMOD | = | 2 | XPART | = | 0.5 |
| +CGDO | = | 6.3E-10 | CGSO | = | 6.3E-10 | CGBO | = | 1E-12 |
| +CJ | = | 1.830742E-3 | PB | = | 0.99 | MJ | = | 0.4728897 |
| +CJSW | = | 3.186944E-10 | PBSW | = | 0.5515582 | MJSW | = | 0.3089606 |
| +CJSWG | = | 2.5E-10 | PBSWG | = | 0.5515582 | MJSWG | = | 0.3089606 |
| +CF | = | 0 | PVTH0 | = | 4.250525E-3 | PRDSW | = | 13.4269534 |
| +PK2 | = | 4.09228E-3 | WKETA | = | 0.0143927 | LKETA | = | 5.423396E-4 |

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