MOSIS WAFER ELECTRICAL TESTS

             RUN: V37P                          VENDOR: AMIS (ON-SEMI)
       TECHNOLOGY: SCN05                      FEATURE SIZE: 0.5 microns
                            Run type: SHR


   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: SMSCN3ME06_ON-SEMI


| TRANSISTOR PARAMETERS | W/L | N-CHANNEL | P-CHANNEL | UNITS |
|---|---|---|---|---|
| MINIMUM | 3.0/0.6 | | | |
| Vth | | 0.76 | -0.90 | volts |
| | | | | |
| SHORT | 20.0/0.6 | | | |
| Idss | | 466 | -255 | uA/um |
| Vth | | 0.65 | -0.88 | volts |
| Vpt | | 13.1 | -12.2 | volts |
| | | | | |
| WIDE | 20.0/0.6 | | | |
| Ids0 | | < 2.5 | < 2.5 | pA/um |
| | | | | |
| LARGE | 50/50 | | | |
| Vth | | 0.67 | -0.94 | volts |
| Vjbkd | | 10.9 | -11.8 | volts |
| Ijlk | | 242.7 | <50.0 | pA |
| Gamma | | 0.49 | 0.56 | V^0.5 |
| | | | | |
| K' (Uo*Cox/2) | | 57.8 | -18.9 | uA/V^2 |
| Low-field Mobility | | 472.03 | 154.35 | cm^2/V*s |

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

| Design Technology | XL (um) | XW (um) |
|---|---|---|
| SCMOS_SUBM (lambda=0.30) | 0.10 | 0.00 |
| SCMOS (lambda=0.35) | 0.00 | 0.20 |


| FOX TRANSISTORS | GATE | N+ACTIVE | P+ACTIVE | UNITS |
|---|---|---|---|---|
| Vth | Poly | >15.0 | <-15.0 | volts |

   COMMENTS:


| PROCESS PARAMETERS | N+ | P+ | N_W | _U | POLY | PLY2_HR | POLY2 | M1 | UNITS |
|---|---|---|---|---|---|---|---|---|---|
| Sheet Resistance | 82.4 | 106.7 | 814.1 | 23.2 | 1076 | | 40.8 | 0.09 | ohms/sq |
| Contact Resistance | 59.6 | 152.5 | | 16.0 | | | 26.0 | | ohms |
| Gate Oxide Thickness | 141 | | | | | | | | angstrom |

| PROCESS PARAMETERS | M2 | M3 | N_W | UNITS |
|---|---|---|---|---|
| Sheet Resistance | 0.09 | 0.05 | 808 | ohms/sq |
| Contact Resistance | 0.84 | 0.82 | | ohms |

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 CAPACITANCE PARAMETERS     N+    P+    POLY   POLY2   M1    M2    M3    N_W      UNITS
  Area (substrate)         416   710    86            29    12    8      91     aF/um^2
  Area (N+active)                      2456           37    17    12            aF/um^2
  Area (P+active)                      2362                                     aF/um^2
  Area (poly)                                 922     64    16    9             aF/um^2
  Area (poly2)                                        58                        aF/um^2
  Area (metal1)                                             32    12            aF/um^2
  Area (metal2)                                                   32            aF/um^2
  Fringe (substrate)       345   236                  51    34    26            aF/um
  Fringe (poly)                                       70    39    28            aF/um
  Fringe (metal1)                                           49    33            aF/um
  Fringe (metal2)                                                 55            aF/um
  Overlap (N+active)                    191                                     aF/um
  Overlap (P+active)                    234                                     aF/um


 CIRCUIT PARAMETERS                                  UNITS
  Inverters                      K
   Vinv                        1.0        2.02      volts
   Vinv                        1.5        2.29      volts
   Vol (100 uA)                2.0        0.47      volts
   Voh (100 uA)                2.0        4.48      volts
   Vinv                        2.0        2.47      volts
   Gain                        2.0      -17.59
  Ring Oscillator Freq.
   DIV256 (31-stg,5.0V)                 103.03      MHz
   D256_WIDE (31-stg,5.0V)              158.86      MHz
  Ring Oscillator Power
   DIV256 (31-stg,5.0V)                   0.48      uW/MHz/gate
   D256_WIDE (31-stg,5.0V)                0.99      uW/MHz/gate


 COMMENTS: SUBMICRON




  V37P SPICE BSIM3 VERSION 3.1 PARAMETERS

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

 * DATE: Oct 17/13
 * LOT: v37p                  WAF: 1003
 * Temperature_parameters=Default
 .MODEL CMOSN NMOS (                           LEVEL   = 49
 +VERSION = 3.1            TNOM    = 27        TOX     = 1.41E-8
 +XJ      = 1.5E-7         NCH     = 1.7E17    VTH0    = 0.6176544
 +K1      = 0.9137986      K2      = -0.1071877  K3    = 22.288867
 +K3B     = -9.7485086     W0      = 2.658488E-8  NLX   = 1E-9
 +DVT0W   = 0              DVT1W   = 0         DVT2W   = 0
 +DVT0    = 0.8309419      DVT1    = 0.3317542  DVT2   = -0.5
 +U0      = 460.0124125    UA      = 2.759471E-13  UB   = 1.603084E-18
 +UC      = 3.089014E-12   VSAT    = 1.840576E5  A0    = 0.5615191
 +AGS     = 0.1204319      B0      = 1.941274E-6  B1    = 5E-6
 +KETA    = -2.797385E-3   A1      = 2.420581E-5  A2    = 0.3164714
 +RDSW    = 1.115544E3     PRWG    = 0.0828351  PRWB   = 0.0311852
 +WR      = 1              WINT    = 2.526685E-7  LINT  = 7.469087E-8
 +XL      = 1E-7           XW      = 0         DWG     = -1.032244E-8
 +DWB     = 1.914595E-8    VOFF    = -6.986376E-5  NFACTOR = 0.8533219
 +CIT     = 0              CDSC    = 2.4E-4    CDSCD   = 0
 +CDSCB   = 0              ETA0    = 2.045973E-3  ETAB  = -3.21453E-4
 +DSUB    = 0.0833302      PCLM    = 2.3615569  PDIBLC1 = 9.500103E-5
 +PDIBLC2 = 1.863456E-3    PDIBLCB = 0.0644698  DROUT  = 1.39184E-3
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+PSCBE1   = 3.853855E8      PSCBE2  = 4.115782E-6    PVAG     = 0
+DELTA    = 0.01            RSH     = 82.4           MOBMOD   = 1
+PRT      = 0               UTE     = -1.5           KT1      = -0.11
+KT1L     = 0               KT2     = 0.022          UA1      = 4.31E-9
+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     = 1.91E-10        CGSO    = 1.91E-10       CGBO     = 1E-9
+CJ       = 4.131634E-4     PB      = 0.8399766      MJ       = 0.4305505
+CJSW     = 3.400072E-10    PBSW    = 0.809471       MJSW     = 0.1977865
+CJSWG    = 1.64E-10        PBSWG   = 0.8            MJSWG    = 0.2019414
+CF       = 0               PVTH0   = -0.028514      PRDSW    = 114.6437024
+PK2      = -0.0768747      WKETA   = -0.0138828     LKETA    = 1.62687E-3      )
*
.MODEL CMOSP PMOS (                                 LEVEL    = 49
+VERSION  = 3.1             TNOM    = 27             TOX      = 1.41E-8
+XJ       = 1.5E-7          NCH     = 1.7E17         VTH0     = -0.9152268
+K1       = 0.553472        K2      = 7.871921E-3    K3       = 8.5645893
+K3B      = 0.5506188       W0      = 1E-8           NLX      = 1.006451E-9
+DVT0W    = 0               DVT1W   = 0              DVT2W    = 0
+DVT0     = 0.4716221       DVT1    = 0.1854949      DVT2     = -0.3
+U0       = 201.3603195     UA      = 2.48572E-9     UB       = 1.005454E-21
+UC       = -1E-10          VSAT    = 1.578444E5     A0       = 0.8192884
+AGS      = 0.1111278       B0      = 5.743519E-7    B1       = 6.088988E-8
+KETA     = -4.865785E-3    A1      = 5.800723E-4    A2       = 0.3229711
+RDSW     = 3E3             PRWG    = -0.0219603     PRWB     = -0.0910566
+WR       = 1.01            WINT    = 2.247043E-7    LINT     = 9.979797E-8
+XL       = 1E-7            XW      = 0              DWG      = 2.080226E-9
+DWB      = -1.38669E-8     VOFF    = -0.0295318     NFACTOR  = 0.5872216
+CIT      = 0               CDSC    = 2.4E-4         CDSCD    = 0
+CDSCB    = 0               ETA0    = 4.979072E-4    ETAB     = -0.2
+DSUB     = 1               PCLM    = 2.3970968      PDIBLC1  = 0.0961044
+PDIBLC2  = 4.073922E-3     PDIBLCB = -0.0315594     DROUT    = 0.2897615
+PSCBE1   = 8E10            PSCBE2  = 8.966681E-8    PVAG     = 0.0149129
+DELTA    = 0.01            RSH     = 106.7          MOBMOD   = 1
+PRT      = 0               UTE     = -1.5           KT1      = -0.11
+KT1L     = 0               KT2     = 0.022          UA1      = 4.31E-9
+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     = 2.34E-10        CGSO    = 2.34E-10       CGBO     = 1E-9
+CJ       = 7.086018E-4     PB      = 0.8698912      MJ       = 0.4856488
+CJSW     = 2.340641E-10    PBSW    = 0.8329387      MJSW     = 0.2034305
+CJSWG    = 6.4E-11         PBSWG   = 0.8            MJSWG    = 0.2261452
+CF       = 0               PVTH0   = 5.98016E-3     PRDSW    = 14.8598424
+PK2      = 3.73981E-3      WKETA   = 0.0120657      LKETA    = -0.0104163      )
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