

## Model file for device variation

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

.lib cmos\_models

\* DATE: Feb 23/01

\* LOT: T0BM WAF: 07

\* Temperature\_parameters=Default

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.MODEL nmos NMOS (          LEVEL = 49
+VERSION = 3.1      TNOM  = 27      TOX  = 5.8E-9
+XJ   = 1E-7      NCH   = 2.3549E17  VTH0 = 0.3907535
+K1   = 0.4376003  K2    = 8.265151E-3 K3   = 4.214601E-3
+K3B  = -3.7220937 W0    = 2.517345E-6 NLX  = 2.310668E-7
+DVT0W = 0      DVT1W = 0      DVT2W = 0
+DVT0  = 0.2411602 DVT1  = 0.3707226 DVT2  = -0.5
+U0   = 316.5922683 UA   = -9.89493E-10 UB   = 2.154013E-18
+UC   = 2.474632E-11 VSAT = 1.254499E5  A0   = 1.2735648
+AGS  = 0.2428704  B0    = 2.579719E-8 B1    = -1E-7
+KETA  = 4.87168E-4 A1    = 0      A2    = 0.5196633
+RDSW  = 120      PRWG  = 0.5      PRWB  = -0.2
+WR    = 1      WINT  = 2.357855E-8 LINT  = 1.210018E-9
+DWG   = 2.292632E-9
+DWB   = -9.94921E-10 VOFF  = -0.1039771 NFACTOR = 1.3905578
+CIT   = 0      CDSC  = 2.4E-4      CDSCD  = 0
+CDSCB = 0      ETA0  = 3.894977E-3 ETAB  = 7.800632E-4
+DSUB  = 0.0307944 PCLM  = 1.7312397 PDIBLC1 = 0.999135
+PDIBLC2 = 4.850036E-3 PDIBLCB = -0.0866866 DROUT  = 0.8612131
+PSCBE1 = 7.995844E10 PSCBE2 = 1.457011E-8 PVAG  = 0.0099984
+DELTA = 0.01     RSH   = 5      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    = -1.22182E-16
+WWN   = 1.2127  WWL   = 0      LL    = 0
+LLN   = 1      LW    = 0      LWN   = 1
+LWL   = 0      CAPMOD = 2      XPART  = 0.4
+CGDO  = 3.11E-10 CGSO  = 3.11E-10 CGBO  = 1E-12
+CJ    = 1.741905E-3 PB   = 0.9876681 MJ   = 0.4679558
+CJSW  = 3.653429E-10 PBSW = 0.99     MJSW  = 0.2943558
+CF    = 0      PVTH0 = -0.01    PRDSW  = 0
+PK2   = 2.589681E-3 WKETA = -1.866069E-3 LKETA = -0.0166961 )
*
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```
.MODEL pmos PMOS (          LEVEL = 49
+VERSION = 3.1      TNOM  = 27      TOX  = 5.8E-9
+XJ   = 1E-7      NCH   = 4.1589E17  VTH0 = -0.583228
+K1   = 0.5999865  K2    = 6.150203E-3 K3   = 0
+K3B  = 3.6314079  W0    = 1E-6      NLX  = 1E-9
+DVT0W = 0      DVT1W = 0      DVT2W = 0
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+DVT0 = 2.8749516   DVT1 = 0.7488605   DVT2 = -0.0917408
+U0   = 136.076212   UA   = 2.023988E-9   UB   = 1E-21
+UC   = -9.26638E-11 VSAT = 2E5         A0   = 0.951197
+AGS  = 0.20963      B0   = 1.345599E-6   B1   = 5E-6
+KETA = 0.0114727    A1   = 3.851541E-4   A2   = 0.614676
+RDSW = 1.496983E3   PRWG = -0.0440632   PRWB = -0.2945454
+WR   = 1            WINT = 7.879211E-9   LINT = 2.894523E-8
+DWG  = -1.112097E-8
+DWB  = 9.815716E-9   VOFF = -0.1204623   NFACTOR = 1.2259401
+CIT  = 0            CDSC = 2.4E-4       CDSCD = 0
+CDSCB = 0          ETA0 = 0.3325261   ETAB = -0.0623452
+DSUB = 0.9206875    PCLM = 0.833903   PDIBLC1 = 9.948506E-4
+PDIBLC2 = 0.0191187 PDIBLCB = -1E-3   DROUT = 0.9938581
+PSCBE1 = 2.887413E10 PSCBE2 = 8.325891E-9   PVAG = 0.8478443
+DELTA = 0.01       RSH  = 3.6         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 = 0.4
+CGDO  = 2.68E-10   CGSO  = 2.68E-10   CGBO  = 1E-12
+CJ    = 1.864957E-3 PB    = 0.976468   MJ    = 0.4614408
+CJSW  = 3.118281E-10 PBSW = 0.6870843   MJSW = 0.3021929
+CF    = 0           PVTH0 = 6.397941E-3 PRDSW = 30.410214
+PK2   = 2.100359E-3 WKETA = 5.428923E-3 LKETA = -0.0111599 )
*
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.endl