\*BSIM4\_0045.lib  
\*Speed parameters SN and SP  
\*.PARAM SN=0 SP=0; Un-comment this command for use with only typical models  
.model NMOS-BSIM 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  
+lint = {3.75e-09\*(1-abs(SN))+2.875e-09\*uramp(-SN)+4.625e-09\*uramp(SN)}  
+vth0 = {0.471\*(1-abs(SN))+0.5\*uramp(-SN)+0.44\*uramp(SN)}  
+k1 = {0.53\*(1-abs(SN))+0.555\*uramp(-SN)+0.503\*uramp(SN)}  
+u0 = {0.04359\*(1-abs(SN))+0.04163\*uramp(-SN)+0.04581\*uramp(SN)}  
+vsat = 147390 rdsw = 155 ndep = 3.3e+18  
+xj = {1.4e-08\*(1-abs(SN))+1.54e-08\*uramp(-SN)+1.26e-08\*uramp(SN)}  
\* 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