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Appendix A The binning MOS model parameters extracted from LDMOS device

.model N NMOS {
+level = 49
+lmin = 1.7e-006
+lmax = 2.0001e-005
+wmin = 3e-006
+wmax = 2.0001e-005
+version = 3.24
+mobmod = 1
+capmod = 3
+nqsmod = 0
+binunit = 2
+binflag = 0
+lref = 1.7e-006
+wref = 3e-006
+tref = 25
+xl = 0
+xw = 0
+lmlt = 1
+wmlt = 1
+tox = 8.4e-008
+toxm = 8.4e-008
+wint = 0
+lint = 0
+dlc = 0
+dwc = 0
+hdif = 3.53e-006
+ldif = 8.5e-008
+ll = 0
+wl = 0
+lln = 1
+wln = 1
+lw = 0
+ww = 0
+lwn = 1
+wwn = 1
+lwl = 0
+wwl = 0
+cgbo = 1e-013
+cgso = 4e-010
+cgdo = 3e-010
+xpart = 1
+vth0 = 1.243
+k1 = 1.836
+k2 = 0.075663825
+lk2 = -1.420765e-007
+wk2 = -2.1311475e-008
+pk2 = 4.2622951e-013
+k3 = 4
+k3b = -1.4
+nlx = 0
+dvt0 = 4.026
+dvt1 = 0.5456
+dvt2 = -0.005512623
+ldvt2 = -1.3114754e-007
+wdvt2 = -1.9672131e-008
+pdvt2 = 3.9344262e-013
+dvt0w = 0
+dvt1w = 0
+dvt2w = 0
+nch = 1.21e+016
+voff = -0.07161
+nfactor = 1
+cdsc = 0
+cdscb = 0
+cdscd = 0
+cit = 0.0001586

+u0 = 0.070526789
+lu0 = -1.4347541e-008
+wu0 = -3.0253809e-008
+pu0 = 5.7311475e-014
+ua = 1.8111263e-009
+lua = 3.0768852e-015
+wua = -3.3471167e-015
+pua = 5.5409836e-022
+ub = 1.0298287e-018
+lub = -8.6848087e-024
+wub = 1.8521697e-024
+pub = -1.7398689e-029
+uc = 4.7684024e-012
+luc = -1.4595628e-016
+wuc = -2.0362584e-017
+puc = -1.2577836e-021
+ngate = 1e+023
+xj = 3.6e-006
+w0 = 0
+prwg = 0
+prwb = 0
+wr = 1
+rdsw = 7000
+a0 = 0.44028737
+la0 = -9.9268852e-007
+wa0 = 8.5982642e-007
+pa0 = 3.4222951e-012
+ags = -0.62440939
+lags = 1.3936176e-005
+wags = 1.8971495e-006
+pags = -3.8358754e-011
+a1 = 0
+a2 = 0.9
+b0 = 0
+b1 = 0
+vsat = 29658.335
+lvsat = 0.16345683
+wvsat = 0.014264995
+pvsat = -2.2177049e-007
+keta = -0.051767239
+lketa = 1.1416831e-007
+wketa = 1.0385323e-008
+pketa = -6.8417705e-013
+dwg = 0
+dwb = 0
+alpha0 = 0
+beta0 = 30
+pclm = 2.0502732
+lpclm = -1.0054645e-006
+wpclm = -3.9344262e-008
+ppclm = 7.8688525e-013
+pdiblc1 = 1e-005
+pdiblc2 = 1e-005
+pdiblcb = 0.01
+drout = 0.56
+pvag = 0
+pscbe1 = 4e+008
+pscbe2 = 1e-007
+delta = 0.01
+eta0 = 0.0001
+etab = 0.0014480874
+letab = -3.0961749e-008
+wetab = -3.2786885e-009
+petab = 6.557377e-014
+dsub = 0.56
+elm = 5
+alpha1 = 0
+lalpha1 = 0
+walpha1 = 0
+palpha1 = 0
+clc = 1e-007
+cle = 0.6
+cf = 0
+ckappa = 0.6
+cgdl = 1e-010
+cgsl = 1e-011

+acde = 0.4
+lacde = 0
+wacde = 0
+pacde = 0
+moin = 6
+lmoin = 0
+wmoin = 0
+pmoin = 0
+noff = 1.85
+lnoff = 0
+wnoff = 0
+pnoff = 0
+voffcv = 0
+lvoffcv = 0
+wvoffcv = 0
+pvoffcv = 0
+kt1 = -0.1065406
+lkt1 = -1.603541e-006
+wkt1 = -2.6916798e-006
+pkt1 = 7.8806557e-012
+kt1l = 0
+kt2 = -0.09942
+ute = -1.5
+ua1 = 5.2117743e-009
+lua1 = 1.3240984e-014
+wua1 = -1.7502411e-015
+pua1 = -4.5245902e-021
+ub1 = -8.8196593e-018
+lub1 = -4.5585792e-024
+wub1 = 6.3101254e-024
+pub1 = -7.9672131e-030
+uc1 = -5.6e-011
+prt = 7000
+at = 33000
+rsh = 4.55
+js = 8e-006
+jsw = 8e-012
+cj = 0.000464
+mj = 0.31
+cjsw = 1.17e-010
+mjsw = 0.3
+pb = 0.81
+rd = 0
+rdc = 0
+rs = 0
+rsc = 0
+xti = 3
+acm = 12
+calcacm = 0
+nj = 1
+pbsw = 0.7
+cjswg = 1.17e-010
+pbswg = 0.7
+mjswg = 0.7
+tcj = 0.001
+tcjsw = 0.001
+tcjswg = 0.001
+tpb = 0.0022
+tpbsw = 0.0019
+tpbswg = 0.0019

}

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碩士論文題目:

高壓元件LDMOS可靠度分析與SPICE模型建立

Investigation of Spice Modeling and Reliability Issues in High Voltage LDMOS