



```
.model 2s970 PNP(Is=465.4f Xti=3 Eg=1.11 Vaf=57 Bf=407.6 Ise=4.683p Ne=2.051
+ Ikf=.3998 Nk=1.192 Xtb=1.5 Var=100 Br=1 Isc=465.4f Nc=1.048
+ Ikr=6.032 Rc=2.343 Cjc=11.59p Mjc=.4014 Vjc=1.155 Fc=.5 Cje=5p
+ Mje=.3333 Vje=.75 Tr=10n Tf=1.252n Itf=1 Xtf=0 Vtf=10)

.model 2sc2240 NPN(Is=99.13f Xti=3 Eg=1.11 Vaf=422.2 Bf=352.8 Ise=1.179p
+ Ns=1.762 Ikr=.4704 Nk=.9631 Xtb=1.5 Var=100 Br=1.663 Isc=555.1p
+ Nc=1.796 Ikr=5.85 Rc=2032 Cjc=.2472 Vjc=.3905 Fc=.5
+ Cje=5p Mje=.3333 Vje=.75 Tr=10n Tf=1.295n Itf=1 Xtf=0 Vtf=10)

.MODEL Qmje340 npn
+IS=1.03431e-13 BF=172.974 NF=0.939811 VAF=27.3487
+IKF=0.0260146 ISE=4.48447e-11 NE=1.61605 BR=16.6725
+NR=0.796984 VAR=6.11596 IKR=0.10004 ISC=9.99914e-14
+NC=1.99995 RB=1.47761 IRB=.02 RBM=1.47761
+RC=0.0001 RCJ=1.42228 XTB=2.70726 XTI=1
+EC=1.206 CJE=1e-11 VJE=0.75 MJE=0.33
+TF=1e-09 XTF=1 VTF=10 ITF=0.01
+CCJ=1e-11 VJC=0.75 MJC=0.33 XCJ=C=0.9
+FC=0.5 CJS=0 VJS=0.75 MJS=0.5
+TR=1e-07 PTF=0 KF=0 AF=1
```

```
.model IRF610 NMOS(Level=3 Gamma=0 Delta=0 Eta=0 Theta=0 Kappa=0.2 Vmax=0 Xj=0
+ Tox=100n Uo=600 Phi=.6 Rs=.5804 Kp=20.77u Ws=.45 L=2u Vto=3.886
+ Rd=.5781 Rds=888.9K Cbd=220.5p Pb=.8 Mj=.5 Fc=.5 Cgso=517.7p
+ Cgdo=.6168p Rg=.2597 Is=1.647p N=1 Tf=.295n)

.model IRF9610 PMOS(Level=3 Gamma=0 Delta=0 Eta=0 Theta=0 Kappa=0.2 Vmax=0 Xj=0
+ Tox=100n Uo=300 Phi=.6 Rs=.721 Kp=10.37u Ws=.64 L=2u Vto=-3.814
+ Rd=1.524 Rds=888.9K Cbd=222.3p Pb=.8 Mj=.5 Fc=.5 Cgso=1.517n
+ Cgdo=30.29p Rg=2.4 Is=886.1E-18 N=4 Tf=1100n)
```

```
.MODEL Q2SA1837_x PNP ( IS=2.39372559E-10 NF=1.304015937 BF=300 VAF=273 IKF=2.087725944 NK=0.94719458 ISE=1.46829699E-11 NE=1.526663542 BR=4 NR=1 VAR=20 IKR=1.05 RE=0 RB=1.8 RC=1.65 CJE=4.7407E-10 VJE=1.1 MJE=0.5 CJC=8.6700E-11 VJC=0.3 MJC=0.3 TF=1.642191E-09 FC=0.5 ITF=1.076260106 XTF=5.868994022 TR=1.38U)
.MODEL Q2SC4793_x NPN ( IS=1.8E-09 NF=1.43 BF=146.38 VAF=273 IKF=2.6 NK=0.95 ISE=6.2869697E-10 NE=2.223629 BR=4 NR=1 VAR=20 IKR=1.05 RE=0 RB=1.7 RC=1.25 CJE=5.96964E-10 VJE=1.1 MJE=0.5 CJC=5.78E-11 VJC=0.3 MJC=0.3 TF=1.22678E-09 FC=0.5 ITF=10 XTF=99.52253015 TR=983N)
```