



```
.model BC550B NPN(Is=7.049f Xti=3 Eg=1.11 Vaf=59.93 Bf=375.6 Ise=56.03f
+ Ne=1.553 Ikr=87.07m Nk=.4901 Xtb=1.5 Br=2.886 Isc=7.371p
+ Nc=1.508 Ikr=5.426 Rc=1.175 Cjc=5.5p Mjc=.3132 Vjc=4924 Fc=.5
+ Cje=11.5p Mje=.6558 Vje=.5 Tr=10n Tf=417.3p Itf=1.512 Xtf=39.51
+ Vtf=10)
* PHILIPS          pid=bc549b case=TO92
* 91-07-31 dsq
*$
.model BC550C NPN(Is=7.049f Xti=3 Eg=1.11 Vaf=23.89 Bf=493.2 Ise=99.2f
+ Ne=1.829 Ikr=1.542 Nk=.6339 Xtb=1.5 Br=2.886 Isc=7.371p
+ Nc=1.508 Ikr=5.426 Rc=1.175 Cjc=5.5p Mjc=.3132 Vjc=4924 Fc=.5
+ Cje=11.5p Mje=.6558 Vje=.5 Tr=10n Tf=420.3p Itf=1.374 Xtf=39.42
+ Vtf=10)
* PHILIPS          pid=bc549c case=TO92
* 91-07-31 dsq
```

```
.MODEL BB212 D ( IS=1e-14 RS=0.0011 CJO=7.202e-10 VJ=.10 TT=5n M=0.9 BV=100 XTf=3 FC=0.5 IBV=0.0001 mfg=Philips type=varactor
```

.tran 0 100m 0 100n startup

