



```
.param Freq=1K
.param FFT=16384
.hour (Freq) V(Vout_pos) 5 5
.tran 0 (50/Freq) (50/Freq) (14/Freq/FFT)
.ac oct 100 1 1G
.tran 0 (14/Freq) (4/Freq) (14/Freq/FFT)
.option noopter
.OPTIONS numdgt=7
.OPTIONS plotwinsize=0
;ac oct 100 1 1000K
.noise V(Vout) V1 dec 100 10 100K
```

```
.model 2N4401 NPN(Is=26.03f Xti=3 Eg=.111 Vaf=90.7 Bf=4.292k Ne=1.244 Ise=26.03f Ikf=.2061 Xtb=1.5 Br=1.01 Nc=2 Isc=0 Rc=.5 Cjc=11.01p
+ Mjc=.3763 Vjc=-.75 Fc=.5 Cje=24.07p Mje=.3641 Vje=-.75 Tr=233.7n Tf=.466.5p Itf=0 Vtf=0 Rb=10 Vceo=40 Icrating=600m mfg=Fairchild)
.model 2N4403 PNP(Is=650.6E-18 Xti=3 Eg=.111 Vaf=115.7 Bf=216.2 Ne=1.829 Ise=58.72f Ikf=1.079 Xtb=1.5 Br=3.578 Nc=2 Isc=0 Rc=.715 Cjc=14.76p
+ Mjc=.5383 Vjc=-.75 Fc=.5 Cje=18.62p Mje=.3357 Vje=-.75 Tr=111.6n Tf=.603.7p Itf=.65 Vtf=.05 Vtf=0 Rb=10 Vceo=40 Icrating=600m mfg=Fairchild)
.MODEL FZT6898 NPN IS=1.8E-12 NF=0.994 BF=1850 IKF=3.2 VAF=24
+ISE=.218E-12 NE=1.345 NR=0.996 BR=370 IKR=.8 VAR=4 ISC=0.36E-12
+NC=1.26 RB=2 RE=.035 RC=.036 CC=74E-12 MOC=.35 VJC=-.485
+CFE=248E-12 TF=0.72E-9 TR=2.07E-9
.MODEL FZT789A/ZTX PNP IS=8.5083E-13 NF=1.007 BF=540 IKF=3.4 VAF=15.5
+ISE=1.60716E-13 NE=1.5059 NR=1.0025 BR=180 IKR=0.3 VAR=9 ISC=7.382E-14
+NC=1.2275 RB=0.8 RE=0.32 RC=0.052 CJC=140E-12 MOC=0.335 VJC=0.26
+CFE=300E-12 TF=0.73E-9 TR=4.2E-9
```