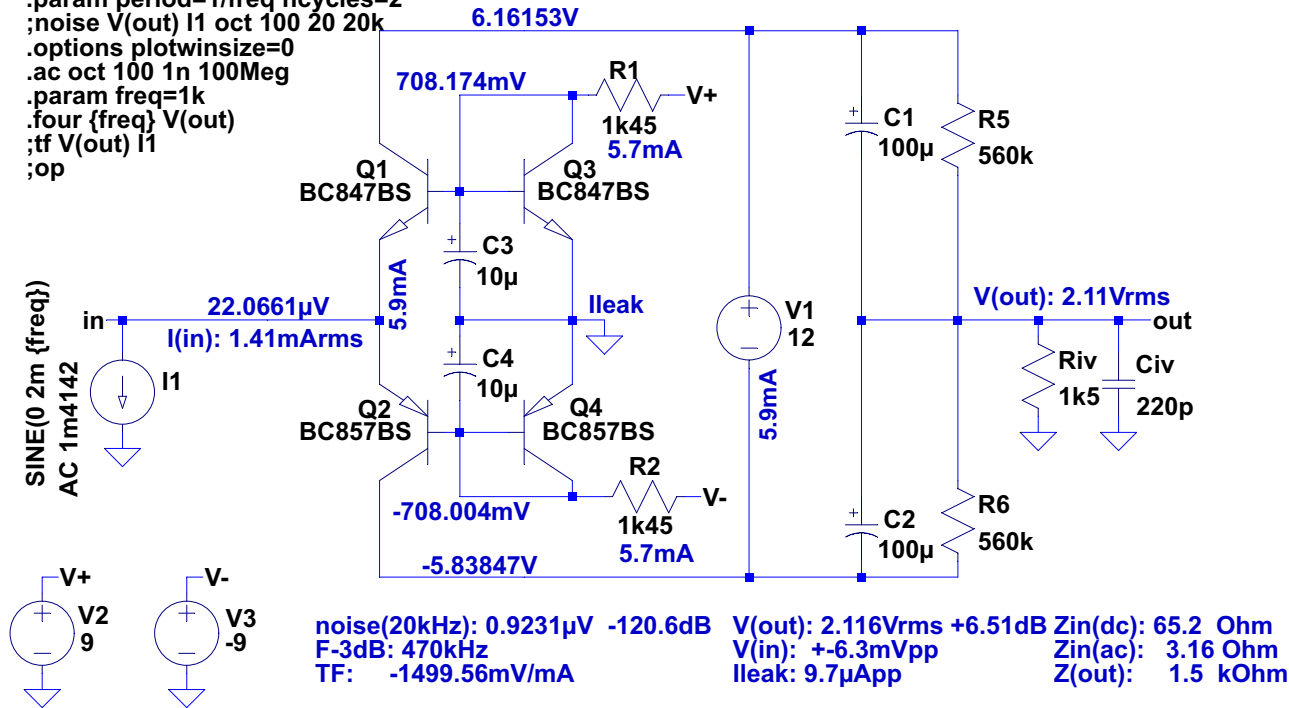


```

.tran 0 {100*ncycles*period} 0 {pi/3.14*period/2e3} .step param freq list 10 100 1k 10
.param period=1/freq ncycles=2
.noise V(out) I1 oct 100 20 20k
.options plotwinsize=0
.ac oct 100 1n 100Meg
.param freq=1k
.four {freq} V(out)
.tf V(out) I1
;op

```



BC847BS : Q1, Q3 THD (k2-k8) @ {freq}:
 BC847BSa: 10Hz: 0.000418% -107.5dB
 BC857BS : Q2, Q4 100Hz: 0.000429% -107.3dB
 BC857BSa: 1kHz: 0.000459% -106.7dB
 10kHz: 0.001607% -95.8dB

BC847BS : THD (k2-k8) @ {freq}:
 BC847BSa: Q1, Q3 10Hz: 0.000464% -106.6dB
 BC857BS : 100Hz: 0.000475% -106.4dB
 BC857BSa: Q2, Q4 1kHz: 0.000503% -105.9dB
 10kHz: 0.001669% -95.5dB

BC847BS : Q3 THD (k2-k8) @ {freq}:
 BC847BSa: Q1 10Hz: 0.000464% -106.6dB
 BC857BS : Q4 100Hz: 0.000476% -106.4dB
 BC857BSa: Q2 1kHz: 0.000503% -105.9dB
 10kHz: 0.001669% -95.5dB

BC847BS : Q3 THD (k2-k8) @ {freq}:
 BC847BSa: Q1 10Hz: 0.000358% -108.9dB
 BC857BS : Q2 100Hz: 0.000350% -109.1dB
 BC857BSa: 1kHz: 0.000398% -108.0dB
 10kHz: 0.001951% -94.1dB

.MODEL BC847BS NPN (IS=9.98f NF=1.00 BF=616 VAF=121 IKF=60.7m
 + ISE=2.81p NE=2.00 BR=4.00 NR=1.00 VAR=20.0 IKR=0.150 RE=0.815
 + RB=3.26 RC=0.326 XTB=1.5 CJE=13.3p VJE=1.10 MJE=0.500
 + CJC=4.33p VJC=0.300 MJC=0.300 TF=585p TR=49.1n EG=1.12
 + Vceo=45 Icrating=100m mfg=Diodes)

.MODEL BC847BSa NPN (IS=9.98f NF=1.00 BF=554 VAF=121 IKF=60.7m
 + ISE=2.81p NE=2.00 BR=4.00 NR=1.00 VAR=20.0 IKR=0.150 RE=0.815
 + RB=3.26 RC=0.326 XTB=1.5 CJE=13.3p VJE=1.10 MJE=0.500
 + CJC=4.33p VJC=0.300 MJC=0.300 TF=585p TR=49.1n EG=1.12
 + Vceo=45 Icrating=100m mfg=Diodes)

.MODEL BC857BS PNP (IS=10.2f NF=1.00 BF=650 VAF=121 IKF=42.5m
 + ISE=2.25p NE=2.00 BR=4.00 NR=1.00 VAR=20.0 IKR=0.105 RE=0.715
 + RB=2.86 RC=0.286 XTB=1.5 CJE=13.3p VJE=1.10 MJE=0.500
 + CJC=7.80p VJC=0.300 MJC=0.300 TF=586p TR=95.9n EG=1.12
 + Vceo=45 Icrating=100m mfg=Diodes)

.MODEL BC857BSa PNP (IS=10.2f NF=1.00 BF=585 VAF=121 IKF=42.5m
 + ISE=2.25p NE=2.00 BR=4.00 NR=1.00 VAR=20.0 IKR=0.105 RE=0.715
 + RB=2.86 RC=0.286 XTB=1.5 CJE=13.3p VJE=1.10 MJE=0.500
 + CJC=7.80p VJC=0.300 MJC=0.300 TF=586p TR=95.9n EG=1.12
 + Vceo=45 Icrating=100m mfg=Diodes)