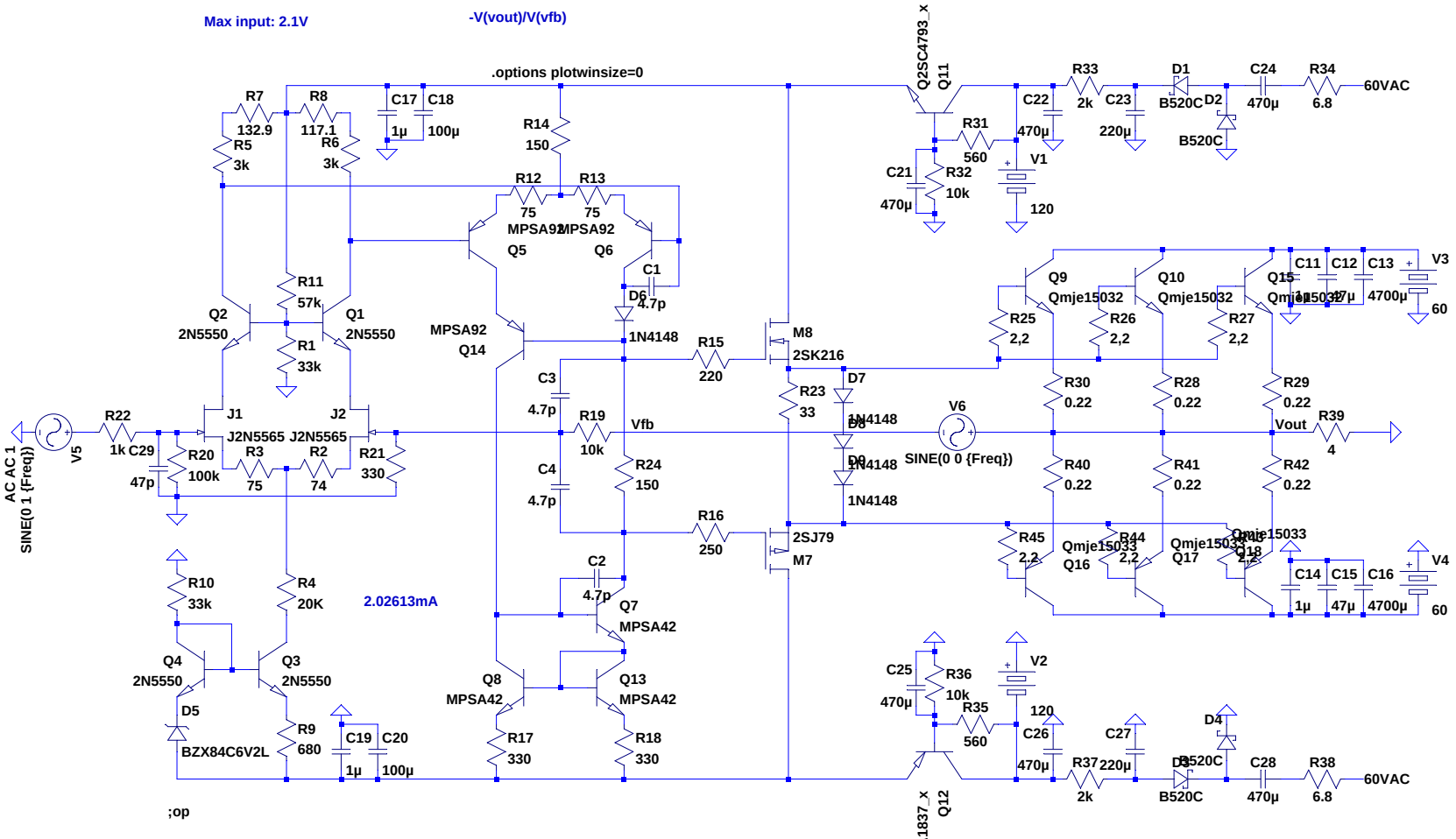
.03

To plot Open-loop gain, run make V6 the AC analysis source and plot:

Max input: 2.1V

-V(vout)/V(vfb)




```
.SUBCKT MSK1058 1 2 3
* TERMINALS: 1 2 3
M1 9 7 8 8 DMOS L=1U W=1U
RD 1 9 80.4M
RS 3 8 5.28M
RG 2 7 21.4
CGS 7 8 410P
EGD 12 0 7 9 1
VFB 14 0 0
FFB 9 7 VFB 1
CGD 13 14 128P
R1 13 0 1
D1 12 13 DLIM
DDG 15 14 DCGD
R2 12 15 1
D2 15 0 DLIM
DSD 8 1 DSUB
LS 30 3 7.5N
LD 1 9 4N
.MODEL DMOS NMOS (LEVEL=3 THETA=85M
.MODEL DCGD D (CJO=128P VJ=.6 M=.68)
.MODEL DSUB D (IS=29N N=1.5 RS=61.4M BV
.MODEL DLIM D (IS=100U)
.ENDS

.SUBCKT MSJ162 1 2 3
* TERMINALS: 1 2 3
M1 9 7 8 8 DMOS L=1U W=1U
RD 9 1 110.4M
RS 8 3 25.28M
RG 7 2 17.4
CGS 7 8 760P
EGD 12 0 1 2 1
VFB 14 0 0
FFB 9 7 VFB 1
CGD 13 14 467P
R1 13 0 1
D1 12 13 DLIM
DDG 15 14 DCGD
R2 12 15 1
D2 15 0 DLIM
DSD 9 8 DSUB
LS 8 3 7.5N
LD 1 9 4N
.MODEL DMOS PMOS (LEVEL=3 THETA=90M
.MODEL DCGD D (CJO=467P VJ=.6 M=.68)
.MODEL DSUB D (IS=29N N=1.5 RS=61.4M BV
.MODEL DLIM D (IS=100U)
.ENDS
```

```
.opti
.opti
.para
.para
.para
.para
.para
.para
.para
.four
.tran
.para

.temp
;ac de
;noise
```

```
.model BC546B NPN(IS=2.39E-14 NF=1.008 ISE=3.55E-15 NE=1.541 BF=294.3 IKF=0.1357 VAF=63.2 NR=1.004 ISC=6.27E-14 NC=1.243 BR=7.946 IKR=0.1144 VAR=25.9 RB=1 IRB=1.00E-06 RBM=1 RE=0.4683 RC=0.85 XTB=0 EG=1.11 XTI=3 CJE=
.model MPSA43 NPN(Is=34.9f Xti=3 Eg=1.11 Vaf=100 Bf=2.65K Ne=1.708 Ise=16.32p Ikf=23.79m Xtb=1.5 Br=9.769 Nc=2 Isc=0 Ikr=0 Rc=7 Cjc=14.23p Mjc=.5489 Vjc=.75 Fc=.5 Cje=49.62p Mje=.4136 Vje=.75 Tr=934.3p Tf=1.69n Itf=5 Vtf=20 Xtf=150
.model MPSA93 PNP(Is=218.9f Xti=3 Eg=1.11 Vaf=100 Bf=99 Ne=1.307 Ise=218.9f Ikf=.2016 Xtb=1.5 Br=24.67 Nc=2 Isc=0 Ikr=0 Rc=7 Cjc=19.88p Mjc=.4876 Vjc=.75 Fc=.5 Cje=81.49p Mje=.3493 Vje=.75 Tr=516.9p Tf=1.395n Itf=1.5 Vtf=22 Xtf=270 R
.model 2N5550 NPN(Is=2.511f Xti=3 Eg=1.11 Vaf=100 Bf=213.4 Ne=1.241 Ise=2.511f Ikf=.3495 Xtb=1.5 Br=3.24 Nc=2 Isc=0 Ikr=0 Rc=1 Cjc=4.883p Mjc=.3047 Vjc=.75 Fc=.5 Cje=18.79p Mje=.3416 Vje=.75 Tr=1.212n Tf=560.1p Itf=50m Vtf=5 Xtf=8 Rb=
.model 2N5401 PNP(Is=21.48f Xti=3 Eg=1.11 Vaf=100 Bf=132.1 Ne=1.375 Ise=21.48f Ikf=.1848 Xtb=1.5 Br=3.661 Nc=2 Isc=0 Ikr=0 Rc=1.6 Cjc=17.63p Mjc=.5312 Vjc=.75 Fc=.5 Cje=73.39p Mje=.3777 Vje=.75 Tr=1.476n Tf=641.9p Itf=0 Vtf=0 Xtf=0 Rb=
.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
.MODEL Q2SC4793_x NPN ( IS=1.8E-09 NF=1.43 BF=146.38 VAF=273 IKF=2.6 NK=0.95 ISE=6.286997E-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
.model MPSA42 NPN(Is=34.9f Xti=3 Eg=1.11 Vaf=100 Bf=2.65K Ne=1.708 Ise=16.32p Ikf=23.79m Xtb=1.5 Br=9.769 Nc=2 Isc=0 Ikr=0 Rc=7 Cjc=14.23p Mjc=.5489 Vjc=.75 Fc=.5 Cje=49.62p Mje=.4136 Vje=.75 Tr=934.3p Tf=1.69n Itf=5 Vtf=20 Xtf=150
.model MPSA92 PNP(Is=218.9f Xti=3 Eg=1.11 Vaf=100 Bf=99 Ne=1.307 Ise=218.9f Ikf=.2016 Xtb=1.5 Br=24.67 Nc=2 Isc=0 Ikr=0 Rc=7 Cjc=19.88p Mjc=.4876 Vjc=.75 Fc=.5 Cje=81.49p Mje=.3493 Vje=.75 Tr=516.9p Tf=1.395n Itf=1.5 Vtf=22 Xtf=270 R
.model J2N5565 NJF(Beta=9.109m Betatce=-.5 Rd=1 Rs=1 Lambda=7.5m Vto=-1.447 Vtotc=-2.5m Is=94.42f Isr=921.9f N=1 Nr=2 Xti=3 Alpha=88.38u Vk=171.6 Cgd=8.67p M=.4742 Pb=1 Fc=.5 Cgs=9.76p Kf=67.86E-18 Af=1)
```