

LM308 Macromodel

```

*
* Linear Technology LM308 op amp model
* Written: 08-23-1989 15:46:51 Type: Bipolar npn input, external comp.
* Typical specs:
* Vos=2.0E-03, Ib=1.5E-09, Ios=2.0E-10, GBP=6.0E+05Hz, Phase mar.= 70 deg,
* SR(+)=2.0E-01V/us, SR(-)=1.9E-01V/us, Av= 110 dB, CMMR= 100 dB,
* Vsat(+)=1.00V, Vsat(-)=1.00V, Isc=+/- 6.0mA, Iq= 300uA
* (input differential mode clamp active)
*
* Connections: + - V+V-0 CaCb
.subckt LM308 3 2 7 4 6 1 8 ; Use C=30 pF in main circuit (Ca to Cb).
* input
rc1 7 80 8.842E+03
rc2 7 90 8.842E+03
q1 80 2 10 qm1
q2 90 3 11 qm2
ddm1 2 3 dm2
ddm2 3 2 dm2
c1 80 90 5.460E-12
re1 10 12 2.245E+02
re2 11 12 2.245E+02
iee 12 4 6.003E-06
re 12 0 3.332E+07
ce 12 0 1.579E-12
* intermediate
gcm 0 8 12 0 1.131E-09
ga 8 0 80 90 1.131E-04
r2 8 0 1.000E+05
* external comp cap used for c2 (see note above).
gb 1 0 8 0 3.146E+01
* output
ro1 1 6 1.111E+02
ro2 1 0 8.889E+02
rc 17 0 3.533E-04
gc 0 17 6 0 2.830E+03
d1 1 17 dm1
d2 17 1 dm1
d3 6 13 dm2
d4 14 6 dm2
vc 7 13 1.766E+00
ve 14 4 1.766E+00
ip 7 4 2.940E-04
dsub 4 7 dm2
* models
.model qm1 npn (is=8.000E-16 bf=1.875E+03)
.model qm2 npn (is=8.643E-16 bf=2.143E+03)
.model dm1 d (is=1.192E-10)
.model dm2 d (is=8.000E-16)
.ends LM308
*
* - - - - - * fini LM308 * - - - - - * [oamm vn1 8/89]

```