```
Using: /bin/time /share/instsww/synopsys/C-2009.09/hspice/sparcOS5/hspice CMOS.sp
 ****** HSPICE -- C-2009.09 32-BIT (Aug 24 2009) sunos ******
  Copyright (C) 2009 Synopsys, Inc. All Rights Reserved.
  Unpublished-rights reserved under US copyright laws.
  This program is protected by law and is subject to the
  terms and conditions of the license agreement from Synopsys.
  Use of this program is your acceptance to be bound by the
  license agreement. HSPICE is the trademark of Synopsys, Inc.
  Input File: CMOS.sp
 lic:
 lic: FLEXlm: v8.5b
 lic: USER:   ee140-cw             HOSTNAME: quasar
 lic: HOSTID: 83846a81             PID:      16944
 lic: Using FLEXlm license file:
 lic: 27005@license-srv.eecs.berkeley.edu
 lic: Checkout 1 hspice
 lic: License/Maintenance for hspice will expire on 25-oct-2013/2012.06
 lic: FLOATING license(s) on SERVER license-srv.eecs.berkeley.edu
 lic:
 Init: read install configuration file: /share/instsww/synopsys/C-2009.09/hspice/meta.cfg
1****** HSPICE -- C-2009.09 32-BIT (Aug 24 2009) sunos ******
 ******
 ** ee140 lab3 : cmos operational amplifier design **

  ******  circuit name directory
 circuit number to circuit name directory
   number circuitname                    definition        multiplier
        0 main circuit
        1 x7.                            pmos              1.00
        2 x3.                            pmos              1.00
        3 x5.                            pmos              1.00
        4 x2.                            nmos              1.00
        5 x4.                            nmos              1.00
        6 x6.                            nmos              1.00
        7 x9.                            pmos              1.00
        8 xr.                            nmos              1.00
        9 x1.                            pmos              1.00
  **warning** (model_ee140_1.sp:14) both nodes of element x2.csubn defined in subckt nmos are connected together.


 **diagnostic** set option symb=1 internally to help for convergence.
 ******************************************************************
 ******  option summary
 ******
 runlvl  = 3         bypass  = 2
  Opening plot unit= 15
 file=CMOS.pa0

1****** HSPICE -- C-2009.09 32-BIT (Aug 24 2009) sunos ******
 ******
 ** ee140 lab3 : cmos operational amplifier design **

  ******  operating point information tnom=  25.000 temp=  25.000 *****
 ***** operating point status is all       simulation time is     0.
    node    =voltage      node    =voltage      node    =voltage

 +0:cm      = 750.0000m 0:drain_m2= 484.7740m 0:gate_m3 = 750.0000m
 +0:gate_m5 = 750.0000m 0:node    = 484.7740m 0:out_1   = 484.7740m
 +0:out_2   = 575.1228m 0:tail    =   1.1440  0:vbias   =   1.1283
 +0:vdd     =   1.5000


 ****  voltage sources

 subckt
 element  0:v1       0:vcm      0:vid1     0:vid2
  volts      1.5000   750.0000m    0.         0.
  current -988.2479u    0.         0.         0.
  power      1.4824m    0.         0.         0.

     total voltage source power dissipation=    1.4824m       watts



 **** resistors

 subckt
 element  0:rbias
  r value    4.6000k
  v drop     1.1283
  current  245.2751u
  power    276.7353u
```

**** mosfets

subckt	x7	x3	x5	x2	x4	x6
element	1:m0	2:m0	3:m0	4:m0	5:m0	6:m0
model	1:pmos_int	2:pmos_int	3:pmos_int	4:nmos_int	5:nmos_int	6:nmos_int
region	Saturati	Saturati	Saturati	Saturati	Saturati	Saturati
id	-353.9799u	-176.9900u	-176.9900u	176.9900u	176.9900u	388.9928u
ibs	0.	3.5598f	3.5598f	0.	0.	0.
ibd	3.5598f	10.1523f	10.1523f	-4.8477f	-4.8477f	-5.7512f
vgs	-371.7348m	-394.0227m	-394.0227m	484.7740m	484.7740m	484.7740m
vds	-355.9773m	-659.2488m	-659.2488m	484.7740m	484.7740m	575.1228m
vbs	0.	355.9773m	355.9773m	0.	0.	0.
vth	-300.0000m	-340.6288m	-340.6288m	300.0000m	300.0000m	300.0000m
vdsat	-63.7165m	-48.4953m	-48.4953m	164.7889m	164.7889m	164.7889m
vod	-71.7348m	-53.3939m	-53.3939m	184.7740m	184.7740m	184.7740m
beta	155.0371m	136.7577m	136.7577m	11.6509m	11.6509m	25.6066m
gam eff	200.0000m	200.0000m	200.0000m	200.0000m	200.0000m	200.0000m
gm	9.8784m	6.6321m	6.6321m	1.9199m	1.9199m	4.2197m
gds	56.0921u	29.4619u	29.4619u	39.1985u	39.1985u	87.9104u
gmb	1.2431m	669.9182u	669.9182u	232.8444u	232.8444u	511.7510u
cdtot	51.5411f	39.8846f	39.8846f	1.4521f	1.4521f	3.0844f
cgtot	121.3208f	101.8738f	101.8738f	3.4791f	3.4791f	7.4933f
cstot	118.1396f	95.8601f	95.8601f	3.3919f	3.3919f	7.3008f
cbtot	48.3599f	33.8709f	33.8709f	1.3649f	1.3649f	2.8919f
cgs	91.9690f	77.2269f	77.2269f	2.6373f	2.6373f	5.6804f
cgd	29.3517f	24.6468f	24.6468f	841.7038a	841.7038a	1.8129f

subckt	x9	xr	x1
element	7:m0	8:m0	9:m0
model	7:pmos_int	8:nmos_int	9:pmos_int
region	Saturati	Linear	Saturati
id	-388.9928u	0.	-245.2751u
ibs	0.	0.	0.
ibd	9.2488f	8.455e-25	3.7173f
vgs	-371.7348m	1.0152	-371.7348m
vds	-924.8772m	-2.1722p	-371.7348m
vbs	0.	0.	0.
vth	-300.0000m	300.0000m	-300.0000m
vdsat	-63.7165m	646.8229m	-63.7165m
vod	-71.7348m	715.2260m	-71.7348m
beta	170.3721m	3.5071m	107.4262m
gam eff	200.0000m	200.0000m	200.0000m
gm	10.8555m	0.	6.8448m
gds	66.0905u	2.5084m	38.9639u
gmb	1.3661m	0.	861.3714u
cdtot	47.9142f	983.7589a	35.5326f
cgtot	121.3208f	1.4590f	83.8541f
cstot	118.1396f	983.7589a	81.6566f
cbtot	44.7331f	508.5600a	33.3351f
cgs	91.9690f	729.4789a	63.5668f
cgd	29.3517f	729.4789a	20.2872f

***** job concluded

1****** HSPICE -- C-2009.09 32-BIT (Aug 24 2009) sunos ******

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** ee140 lab3 : cmos operational amplifier design **

****** job statistics summary tnom= 25.000 temp= 25.000 *****

****** HSPICE Threads Information ******

Command Line Threads Count : 1
Available CPU Count : 4
Actual Model Evaluation(Load) Threads Count : 1
Actual Solver Threads Count : 1

****** Circuit Statistics ******

# nodes	=	11	# elements	=	22		
# resistors	=	1	# capacitors	=	8	# inductors	= 0
# mutual_inds	=	0	# vccs	=	0	# vcvs	= 0
# cccs	=	0	# ccvs	=	0	# volt_srcs	= 4
# curr_srcs	=	0	# diodes	=	0	# bjts	= 0
# jfets	=	0	# mosfets	=	9	# U elements	= 0
# T elements	=	0	# W elements	=	0	# B elements	= 0

```
 # S elements  =       0 # P elements =       0 # va device   =       0


 ******  Runtime Statistics (seconds)  ******

 analysis           time    # points   tot. iter  conv.iter
 op point           0.01           1           7
 readin             0.04
 errchk             0.01
 setup              0.00
 output             0.00


          total memory used          168  kbytes
          total cpu time            0.06 seconds
          total elapsed time        0.21 seconds
          job started at     14:11:21 05/02/2013
          job ended   at     14:11:21 05/02/2013


lic: Release hspice token(s)
```