



```

let f =          mag(frequency[ sortorder( abs(gain+3.0) )[0] ] )
let cds =       1/(6.28e4*f)
echo           "3dB point f = $&f Hz cds = $&cds"

```

```

let cbs =       cds/2
let cgb =       cb - cds
let cgs =       (cg - cgb)/2
echo           "cbs = cbd = $&cbs"
echo           "cgs = cgd = $&cgs"
echo           "cgb = $&cgb"
.endc

```

```

.model          NMOSC          NMOS
+ Level= 8      Tnom=27.0
*-----Process-----
+ tox=160e-10  xj=0.25e-06      nch=0.5e+17
*-----V threshold-----
+ vth0=0.72    n1x=0.12e-06
*-----Bulk-----
+ k1=1.04      k2=-1.209E-01
*-----mobility-----
+ u0=678       ua=8.964e-10
+ ub=1.472e-18 uc=-4.441E-17      vsat=86000
*-----Subthreshold-----
+ nfactor=1.8
+ cit=-5.0E-04 voff=-7.862E-02
+ eta0=4.441e-16 etab=-2.E-01      dsub=0.7
*-----Hot electrons-----
+ alpha0=1.61e-05 beta0=36.68
*-----VAF-----
+ lint=.12e-06 pclm=.19      psobel=3.79e+08  psobe2=9.4e-05
+ delta=0.01655 pvag=0.4484
*-----Bulk_diode-----
+ js=5.858e-08
*-----Resistance-----
+ rsh=70       rdsw=375
+ wr=0.7586    prwb=0      prwg=-4.441E-17
*-----Capacitance-----
+ cj=0.0002424 cjsw=2.73e-10  mj=0.3551      mjsw=0.3873
+ cgso=9e-13  cgdo=9e-13    cgbo=7e-10
+ cdsc=-2.4E-4 cdscd=-1.506E-01 cdscb=-2.219E-04
+ pb=0.5614    pbsw=0.8      xpart=0
+ dlc=5e-08    dwc=1.5e-07
*-----BulkChargeEffect-----
* a0=0.7       a1=0          a2=1          ags=0.05583
* b0=6.305e-08 b1=6.579e-08 keta=-1.531E-02
*-----ShortChannel-----
+ dvt0=2.2     dvt1=0.53     dvt2=-1.521E-01  drout=0.76
+ pdiblc1b=.4  pdiblc1=0.00886 pdiblc2=0.00029
*-----NarrowChannel-----
+ w0=2.6e-04   wint=0.16e-06
+ ww=-9.525E-14 wwn=1.0

```

```

+ dvt0w=0          dvt1w=5.3e6          dvt2w=-1.E-01
+ k3=2.53          k3b=-5              dwg=0              dwb=0
*-----Noise-----
* af=1            kf=1e-28              ef=0.95
*-----Temperature-----
* pvsat=0         ute=-1.258E+00          kt1=-3.85E-01
* kt1l=0          kt2=-3.098E-02          ua1=5.705e-09
* ub1=-1.147E-17 uc1=-1.302E-01          at=20380
* prt=-3.287E+02 lk1=0              lk2=0
* lvsat=0         la0=0              lags=0              lute=0
* luc=0

```

.end

**.end**

=====END\_OF\_SPICE=====

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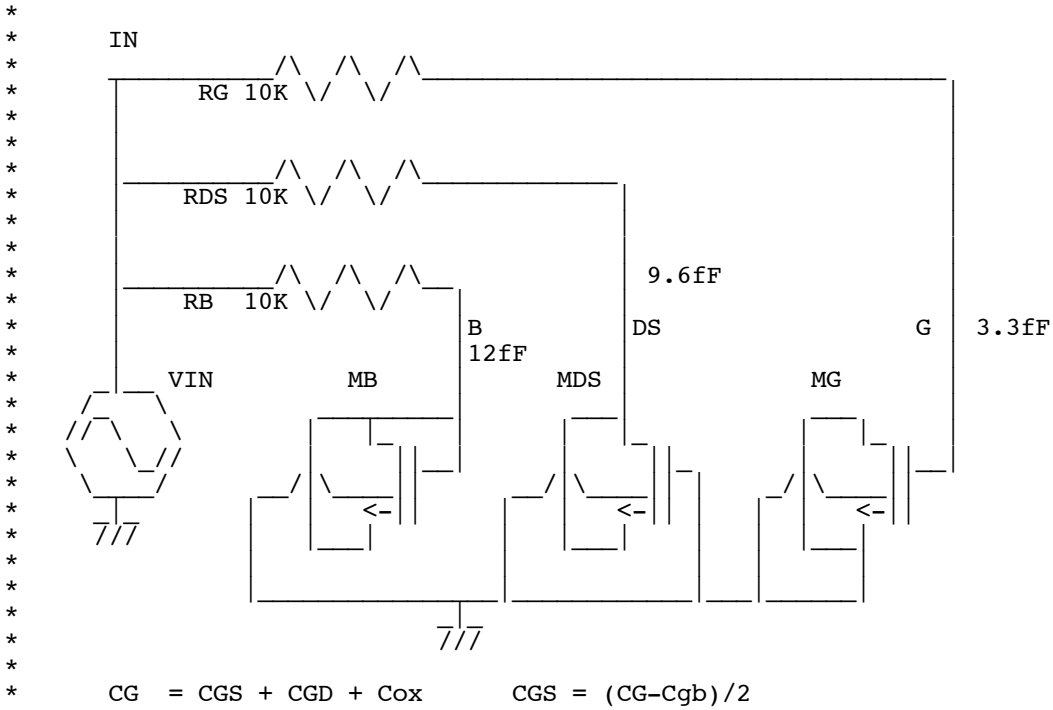
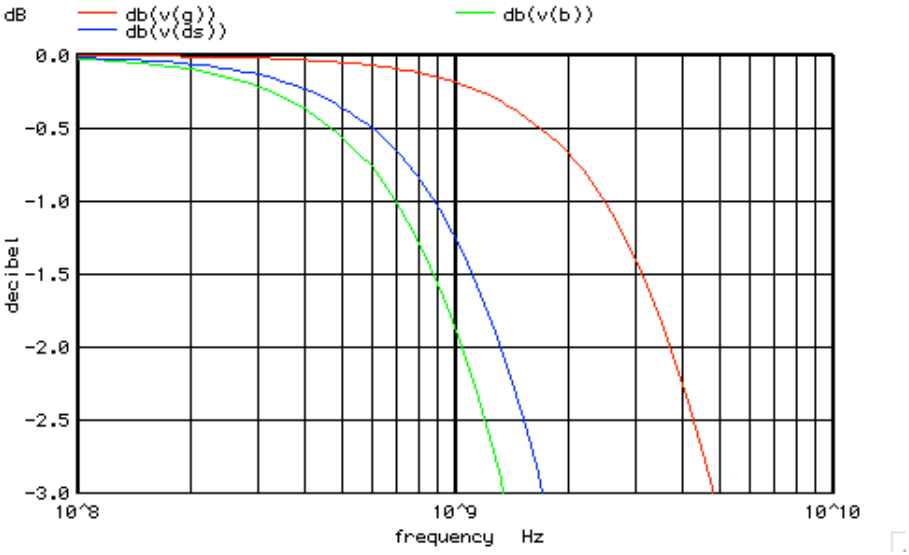
Circuit: BSIM\_NMOS\_Caps

```

3dB point f = 4.7863E+09 Hz cg = 3.3269E-15
3dB point f = 1.31826E+09 Hz cb = 1.20793E-14
3dB point f = 1.7378E+09 Hz cds = 9.16306E-15
cbs = cbd = 4.58153E-15
cgs = cgd = 2.0535E-16
cgb = 2.9162E-15

```

Graph 56 - ac51: BSIM\_NMOS\_Caps

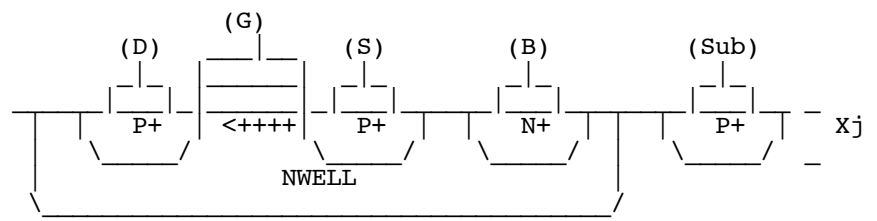
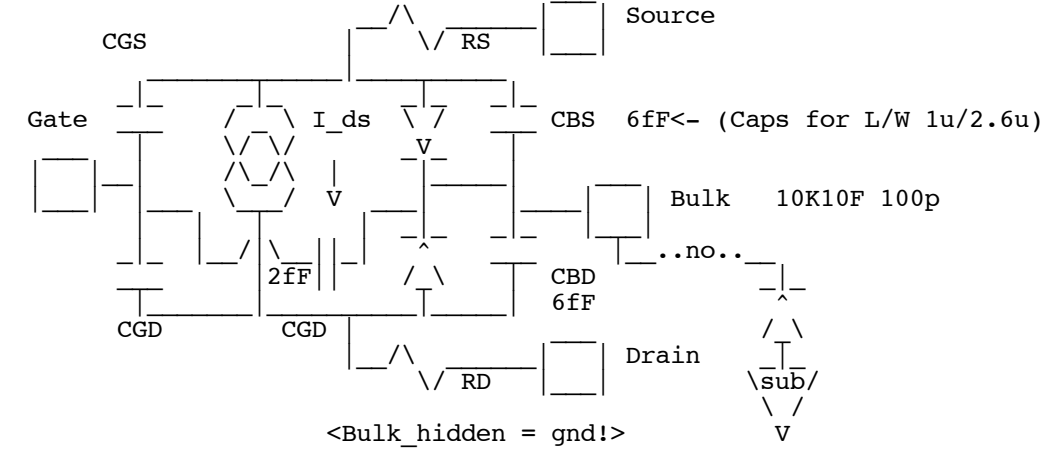


```

*      CB = CBS + CBD + Cox      Cgb = CB -CDS
*      CDS = CBS + CBD          CBS = CDS/2

```

SPICE MODEL



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