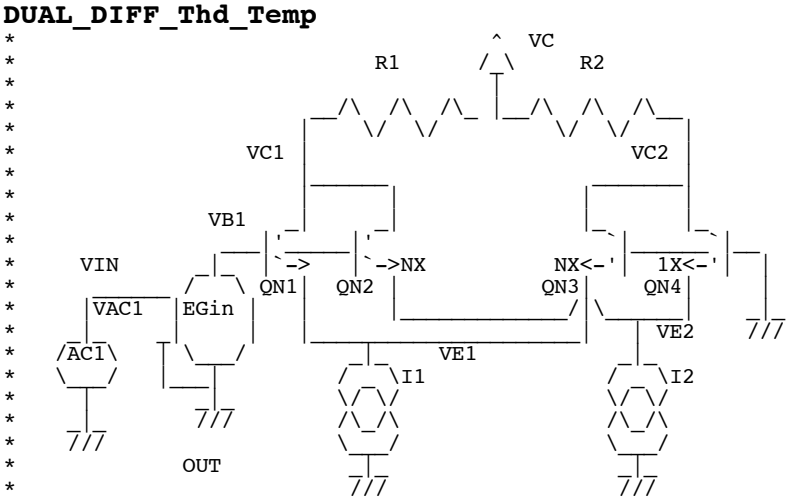
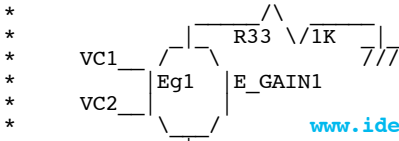
DUAL_DIFF_Thd_Temp





www.idea2ic.com dsauersanjose@aol.com 4/15/08

```
.OPTIONS  GMIN=1e-18    METHOD=trap   srcsteps = 1  gminsteps = 1
*========= ====== ====== ====== ====== ====== ====== ======
VCC       VC     0      DC     10
VAC1      VIN    0      DC     0      SIN(   0      1   1000 )
I1        VE1    0      1u
I2        VE2    0      1u
QN1       VC1    VB1    VE1    NPN1   1.00
QN2       VC1    VB1    VE2    NPN1   4.25
QN3       VC2    0      VE1    NPN1   4.25
QN4       VC2    0      VE2    NPN1   1.00
R1        VC1    VC     52K
R2        VC2    VC     52K
E_GAIN1   OUT    0      VC1    VC2    1
E_GAININ  VB1    0      VIN    0      1m

.control
tran              25u                    5m         0    1u
plot              out
echo              "THD% versus VIN_vpk and Temp_C"
setplot           new
set               NameList =  (       minus55C plus25C plus125C )
compose           TempVals    values  (-55)    25      125
compose           VinVals     values  10m 15m  20m 25m 30m 35m 40m 45m 50m 60m 70m 80m 90m
settype           voltage     VinVals
let               NoOfTemp =  length(TempVals)
let               NoOfVin =   length(VinVals)

begin
unset             interrupt
* ===============Loop_Temp============
let               j         =  1
while             (j        <=  NoOfTemp )
let               Tmp        =  TempVals[j-1]
set               temp       =  $&Tmp
set               thisName   =  $NameList[$&j]
let               $thisName =  0 * vector(NoOfVin)

* ===============Loop_Vin==============
let               k             = 1
while             (k           <= NoOfVin )
let               Vin           = VinVals[k-1]
alter             e_gainin gain = $&Vin
tran              25u             5m        0    1u
linearize
set               specwindow=     "blackman"
spec              200     8k      200     v(out)
let               thdsq =mag(out[9])^2 +mag(out[14])^2  +mag(out[19])^2  +mag(out[24])^2
let               thd_percent= 100*sqrt(thdsq)/mag(out[4])
echo              "$&unknown.Vin       $&thd_percent"
let               unknown.{$thisName}[unknown.k-1] = thd_percent
repeat            3
```

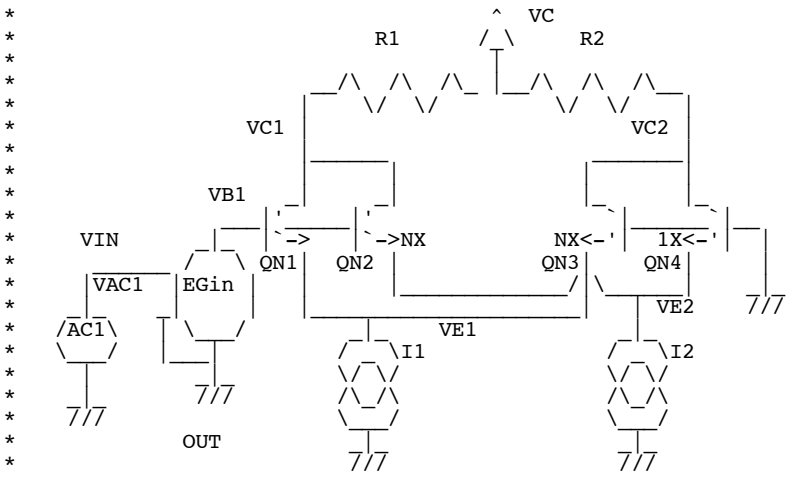
```
destroy
end
if              ($?interrupt)
goto            bail
endif
let             k =          k + 1
endwhile
setscale        VinVals
plot            $NameList loglog title "DUAL_DIFF THD_% vs Vin_pK and Temp_C"
let             j =          j + 1
endwhile
label           bail
echo           "Done."
end
.endc

*======== ====== ====== ====== ====== ====== ====== ====== ======
.model    NPN1   NPN(    BF=2100 VAF=216 )
.model    PNP1   PNP(    BF=2100  VAF=21)
.end
```

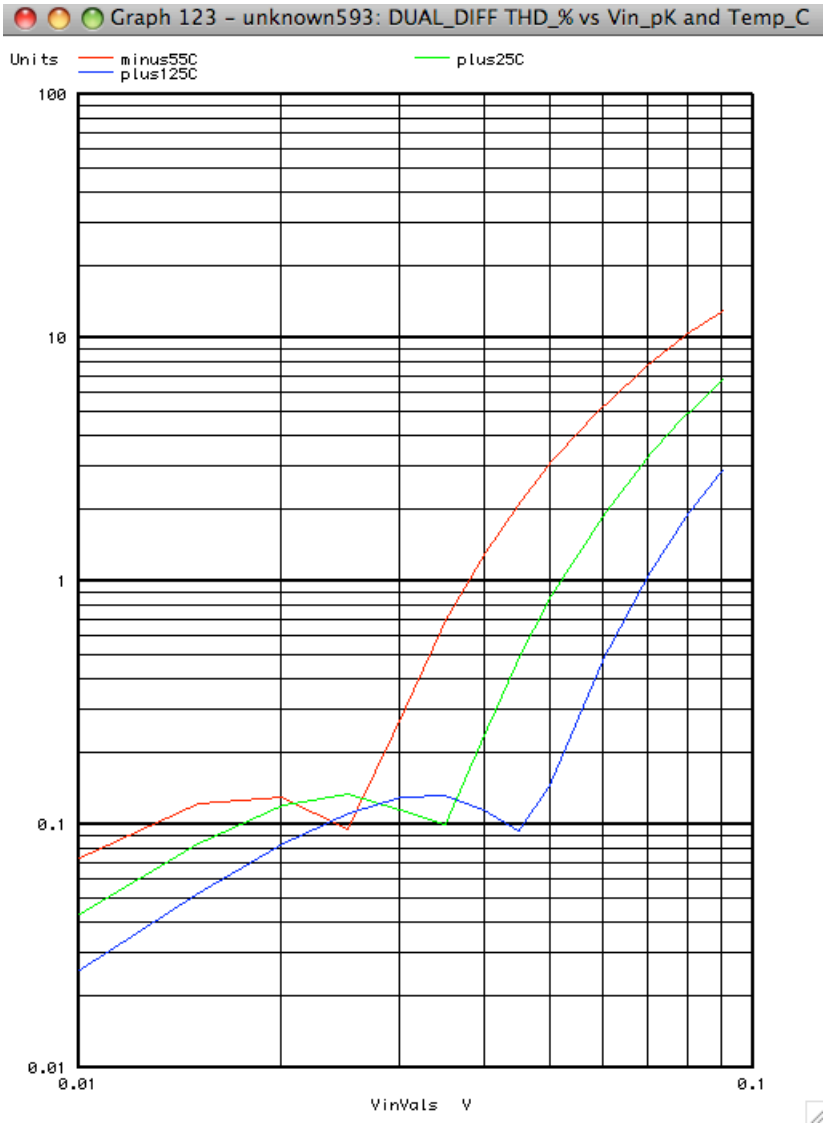
======================END_OF_SPICE=======================

To Covert PDF to plain text click below
http://www.fileformat.info/convert/doc/pdf2txt.htm

**This simulation only works on MacSpice for now.
Data in spice apparently gets stored in vectors which
are ready to be ploted.**



The distortion method does a transient analysis at various input levels and temperatures. The distortion is found by doing an RMS sum of the harmonics and then dividing by the fundamental.



Plotting distortion versus input level shows that the distortion is scaled to absolute temperature.