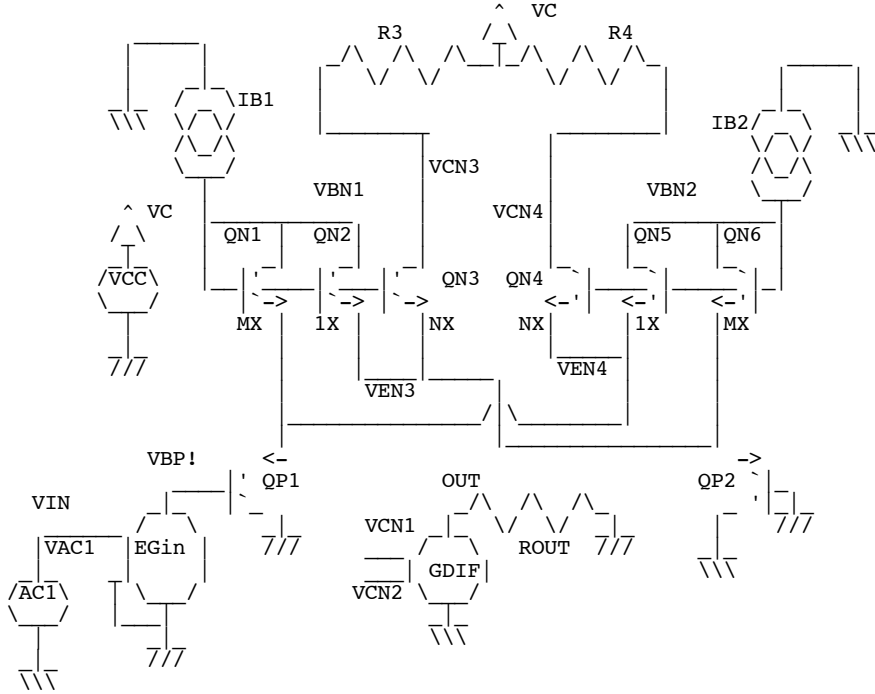


AB_BIAS_DIFF_Thd_TEMP

* www.idea2ic.com
 * dsauersanjose@aol.com 4/23/08



```
.OPTIONS GMIN=1e-18 METHOD=trap srcsteps = 1 gminsteps = 1
*=====
VCC      VC      0          DC      10
VAC1     VIN     0          DC      0      SIN( 0      1  1000 )
IB1      0      VBN1     1u
IB2      0      VBN2     1u
QN1      VBN1   VBN1     VE4     NPN1   4.50
QN2      VBN1   VBN1     VE3     NPN1   1.00
QN3      VCN3   VBN1     VE3     NPN1   15.00

QN4      VCN4   VBN2     VE4     NPN1   15.00
QN5      VBN2   VBN2     VE4     NPN1   1.00
QN6      VBN2   VBN2     VE3     NPN1   4.70

QP1      0      VBP1     VE3     PNP1   1.00
QP2      0      0         VE4     PNP1   1.00
R3       VCN3   VC       1K
R4       VCN4   VC       1K
E_DIF    OUT    0         VCN3   VCN4   1
ROUT     OUT    0         1K
E_GAININ VBP1   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 30m 35m 40m 60m 70m 80m 100m 110m 120m 140m 150m 170m 185m 200m
250m
settype   voltage     VinVals
let       NoOfTemp = length(TempVals)
let       NoOfVin = length(VinVals)

begin
unset
interrupt
* =====Loop_Temp=====
let      j = 1
while    (j <= NoOfTemp )
let      Temp = TempVals[j-1]
set      temp = $&Temp
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 "AB_BIAS 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

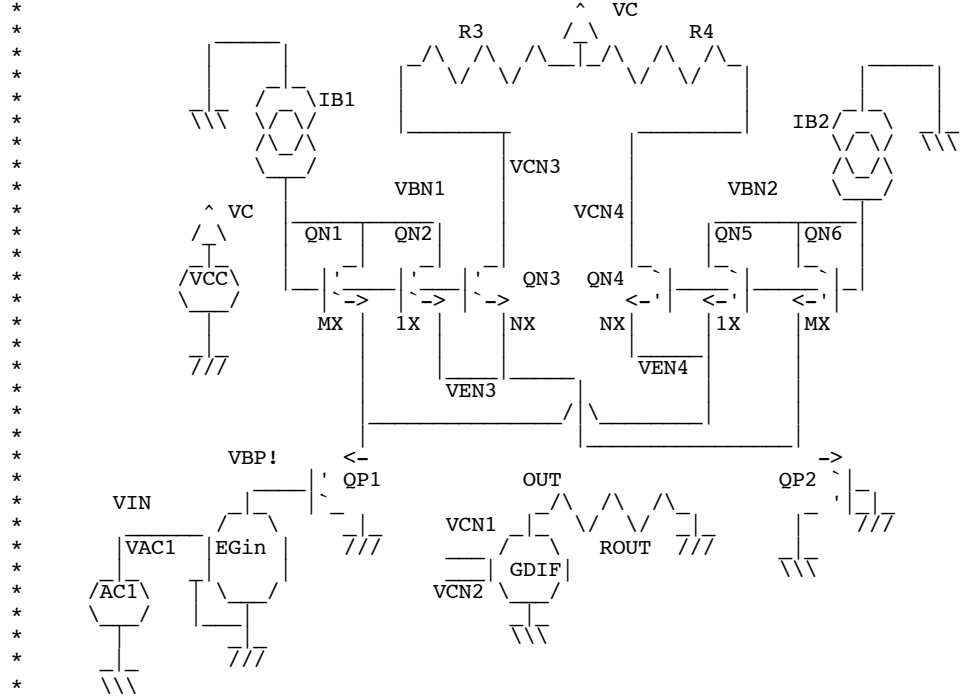
```

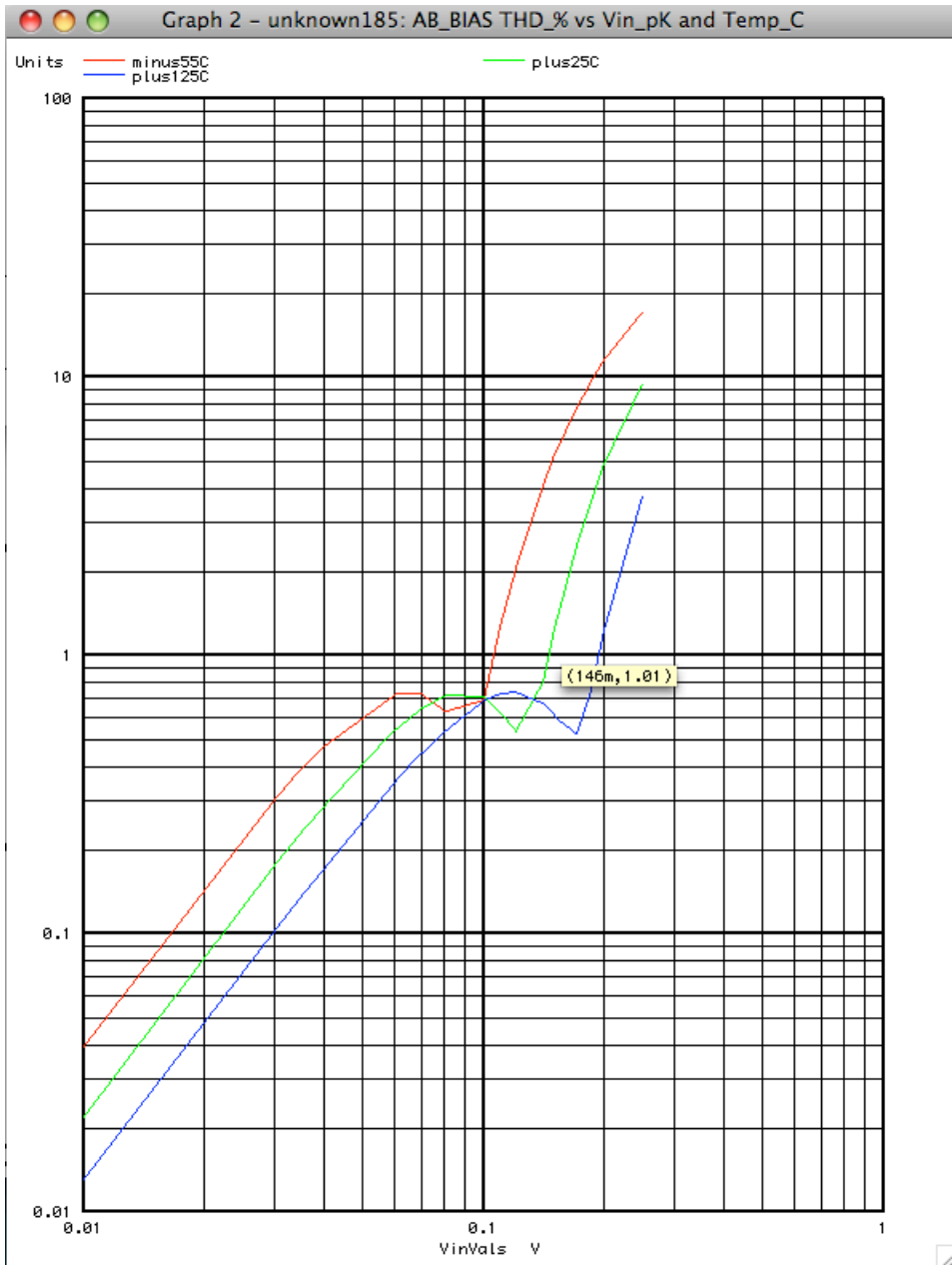
=====END_OF_SPICE=====

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 plotted.

The distortion simulation 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 shape for the AB_Bias input stage is constant in shape over temperature but is scaled to absolute temperature. The same is true for the dual input differential stage shown below.

Graph 123 - unknown593: DUAL_DIFF THD_% vs Vin_pK and Temp_C

