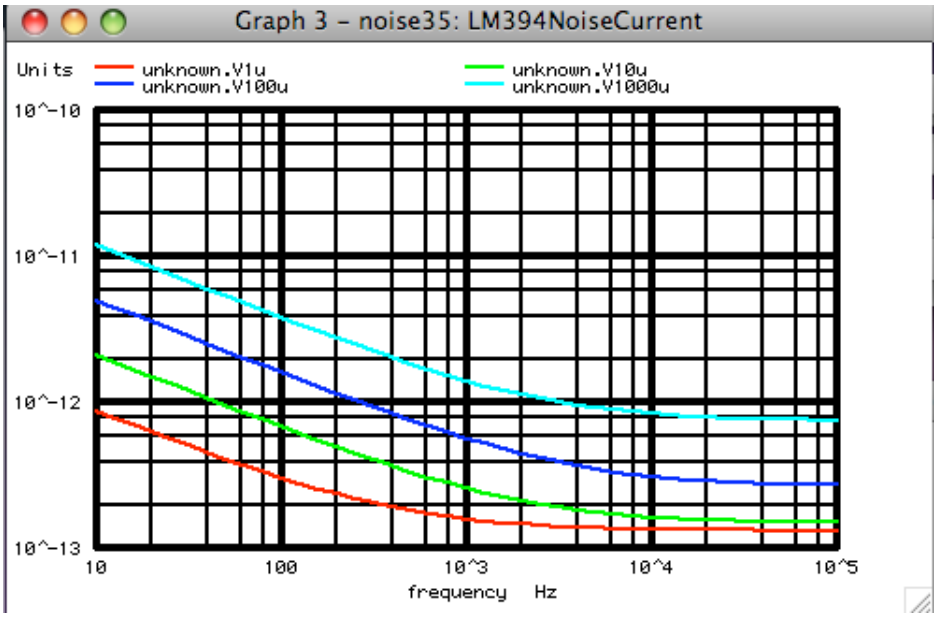
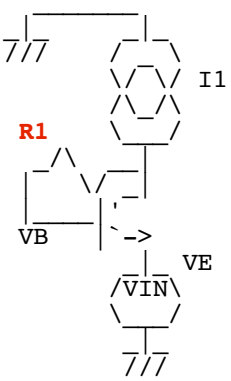
=======BJT Noise Current Test========

HOW TO DO NOISE MODEL VERIFICATION.



BJT Noise Current Test

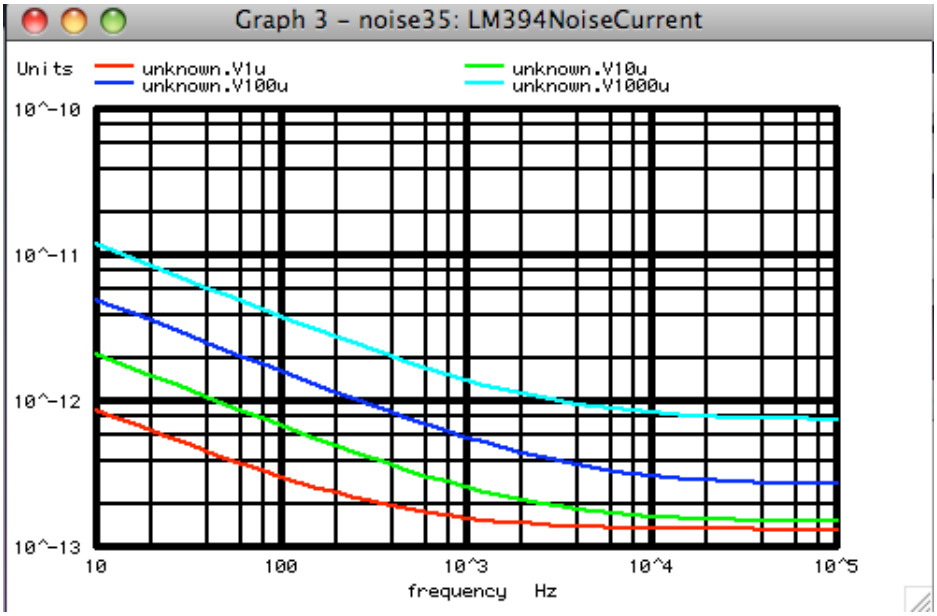



```
vin                 VE  0  DC    0.0 ac 1.0u
I1                  0   VC 1uA
R1                  VC  VB 1000k
q1                  VC  VB VE    LM394
.model              LM394 npn kf=.3e-16 af=.75 bf=600 rb=50
.control
setplot               new
let               "V1u"     =     0*vector(41)
let               "V10u"    =     0*vector(41)
let               "V100u"   =     0*vector(41)
let               "V1000u"  =     0*vector(41)
*run
op
*display
noise               v(vc) vin dec 10 10 100k 1
destroy
let                 unknown.V1u = sqrt(v(onoise_spectrum))*1u
alter               I1      dc  = 10u
op
noise               v(vc) vin dec 10 10 100k 1
destroy
let                 unknown.V10u = sqrt(v(onoise_spectrum))*1u
alter               I1      dc  = 100u
```

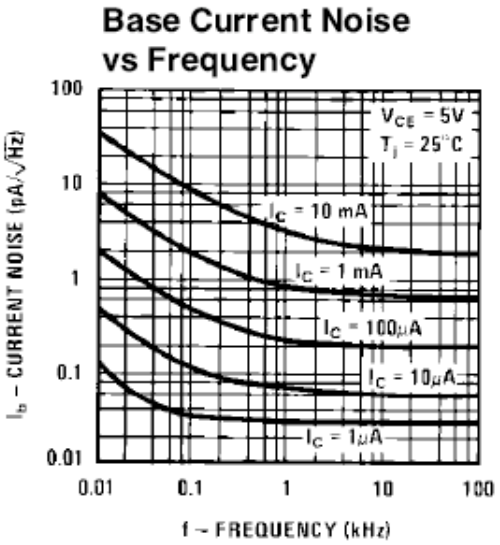
```
op
noise              v(vc) vin dec 10 10 100k 1
destroy
let                unknown.V100u = sqrt(v(onoise_spectrum))*1u
alter              I1      dc  = 1000u
op
noise              v(vc) vin dec 10 10 100k 1
destroy
let                unknown.V1000u = sqrt(v(onoise_spectrum))*1u
set pensize =          2
plot unknown.V1u unknown.V10u unknown.V100u unknown.V1000u vs frequency loglog title
LM394NoiseCurrent
echo               "     ... done."
.endcontrol
.end
```

==========END==========

Noise current is measured by adding a 1MegOhm resistor in the base such that the base current noise dominates.



Spice likes to think in terms of power. Therefore a square root function needs to be applied to the output noise. In the output noise is onoise_spectrum. The refered to input noise is the should equal the output noise divided by the gain.



Getting the simulated base noise to track silicon is becoming difficult here. Changes in AF or KF affect each other. So there may be a trade off between the two.