

Results of HICUM Level2V2.21 & Level2V2.11

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- These results show that v2.21 simulations provide identical results with the v2.11 if the additional v2.21 parameters are kept at their default values. Both set of model parameters for simulations are given below:
- V2.21: c10=3.76E-32 qp0=2.78e-14 ich=2.09e-2 hfe=1.0 hfc=1.0 hjei=1.0 hjci=1.0 tr=0.0 ibeis=1.16E-20 mbei=1.015 ireis=1.16e-16 mrei=2.0 ibeps=3.72e-21 mbep=1.015 ireps=1.0e-30 mrep=2.0 mcf=1.0 alb=6.0e-3 ibcis=1.16e-20 mbci=1.015 ibcx=4.39e-20 mbcx=1.03 ibets=1.0e-20 abet=40.0 favl=1.186 qavl=11.1e-5 alfav=0.825e-4 alqav=0.196e-3 rbi0=71.76 rbx=8.83 fgeo=0.73 fdqr0=0.2 fcrbi=0.0 fqi=1.0 re=12.534 rcx=9.165 itss=1.0e-16 msf=1.05 iscs=1.0e-17 msc=1.0 tsf=1.05 rsu=10.0 csu=2.1e-15 cjei0=8.11e-15 vdei=0.95 zei=0.5 ajei=1.8 cjep0=2.07e-15 vdep=1.05 zep=0.4 ajep=2.4 cji0=1.16e-15 vdcj=0.8 zci=0.333 vptci=46 cjc0=5.4e-15 vdcx=0.7 zcx=0.333 vptcx=100 fbcpar=0.1526 cjs0=3.64e-14 vds=0.6 zs=0.447 vpts=100 t0=4.75e-12 dt0h=2.1e-12 tbvl=4.0e-12 tef0=1.8e-12 gtfe=1.4 thcs=30.0e-12 ahc=0.75 fthc=0.6 rci0=127.8 vlim=0.7 vces=0.1 vpt=5 cbepar=1.13e-15 cbepar=2.97e-15 alqf=0.225 alit=0.45 kf=1.43e-8 af=2.0 latb=0.0 latl=0.0 vgb=1.17 alt0=0.0 kt0=0.0 zetaci=1.6 alvs=1.0e-3 alces=0.4e-3 zetarbi=0.588 zetarbx=0.206 zetarcx=0.223 zetare=0.0 zetacx=2.2 rth=1000.0 cth=1.0e-10 tnom=27.0 dt=0.0 flcomp=0 tunode=1.0 flnqs=0.0 flsh=0.0 cfbe=-1 zetabet=3.5 zetact=3.0 (Additional parameters are kept at their default values)
- V2.11: c10=3.76E-32 qp0=2.78e-14 ich=2.09e-2 hfe=1.0 hfc=1.0 hjei=1.0 hjci=1.0 tr=0.0 ibeis=1.16E-20 mbei=1.015 ireis=1.16e-16 mrei=2.0 ibeps=3.72e-21 mbep=1.015 ireps=1.0e-30 mrep=2.0 mcf=1.0 alb=6.0e-3 ibcis=1.16e-20 mbci=1.015 ibcx=4.39e-20 mbcx=1.03 ibets=1.0e-20 abet=40.0 favl=1.186 qavl=11.1e-5 alfav=0.825e-4 alqav=0.196e-3 rbi0=71.76 rbx=8.83 fgeo=0.73 fdqr0=0.2 fcrbi=0.0 fqi=1.0 re=12.534 rcx=9.165 itss=1.0e-16 msf=1.05 iscs=1.0e-17 msc=1.0 tsf=1.05 rsu=10.0 csu=2.1e-15 cjei0=8.11e-15 vdei=0.95 zei=0.5 aljei=1.8 cjep0=2.07e-15 vdep=1.05 zep=0.4 aljep=2.4 cji0=1.16e-15 vdcj=0.8 zci=0.333 vptci=46 cjc0=5.4e-15 vdcx=0.7 zcx=0.333 vptcx=100 fbc=0.1526 cjs0=3.64e-14 vds=0.6 zs=0.447 vpts=100 t0=4.75e-12 dt0h=2.1e-12 tbvl=4.0e-12 tef0=1.8e-12 gtfe=1.4 thcs=30.0e-12 ahc=0.75 fthc=0.6 rci0=127.8 vlim=0.7 vces=0.1 vpt=5 ceox=1.13e-15 ccox=2.97e-15 alqf=0.0 alit=0.0 kf=1.43e-8 af=2.0 latb=0.0 latl=0.0 vgb=1.17 alt0=0.0 kt0=0.0 zetaci=1.60 alvs=1.0e-3 alces=0.4e-3 zetarbi=0.588 zetarbx=0.206 zetarcx=0.223 zetare=0.0 krbi=1.0 zetacx=2.2 rth=0.0 cth=0.0 tnom=27.0 dt=0.0
- In the figures the continuous line signifies V2.21 results whereas symbols signifies V2.11 results.

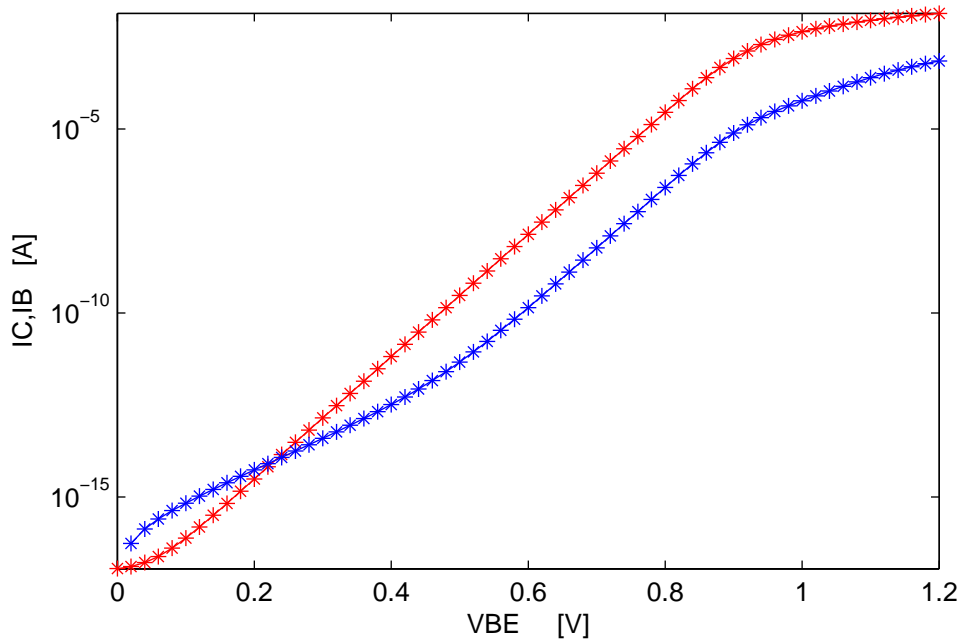


FIGURE 1. Forward Gummel plots at VCE=2.5V

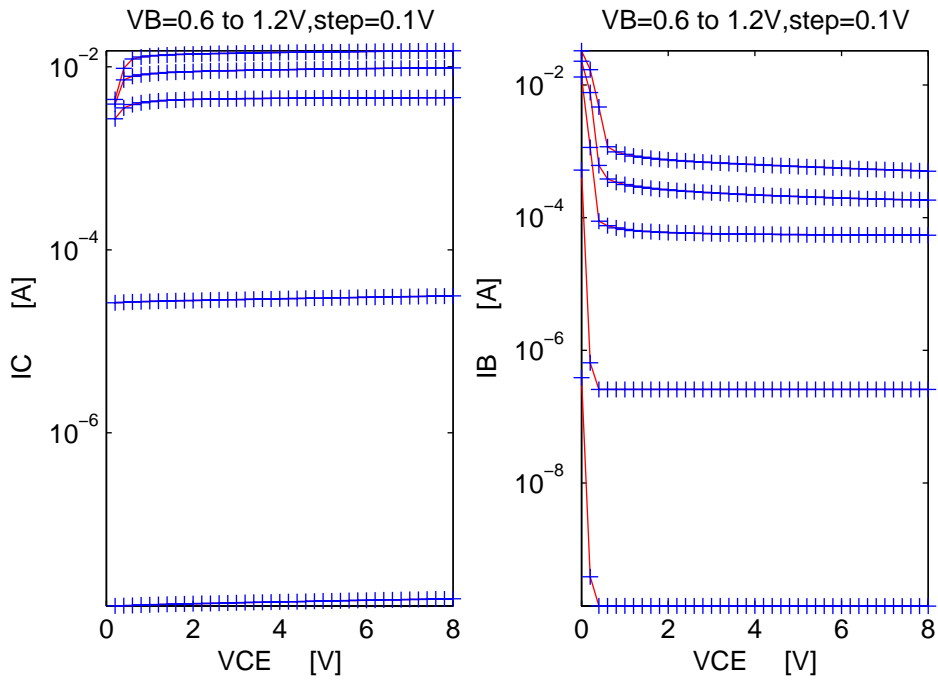


FIGURE 2. VB-forced output characteristics and IB-VCE plots

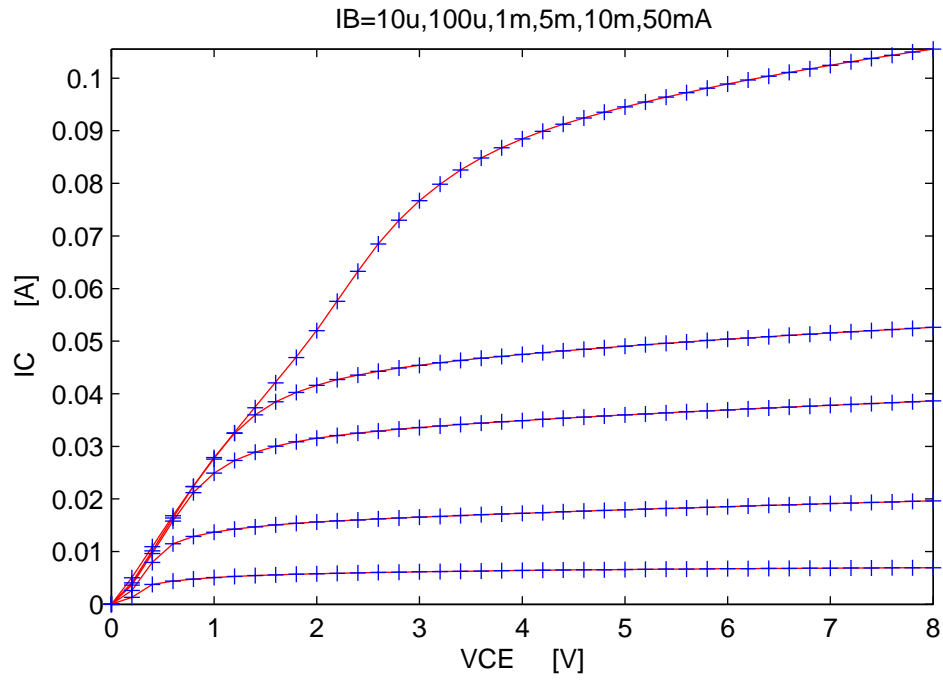


FIGURE 3. IB-forced Output characteristics

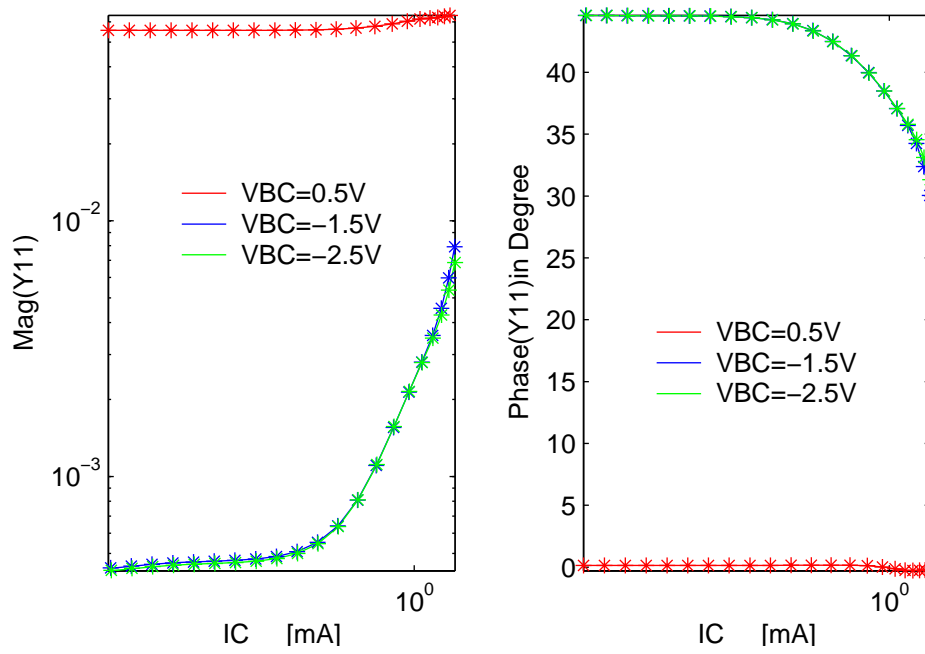


FIGURE 4. Y11 vs. IC plots at f=2.8GHz

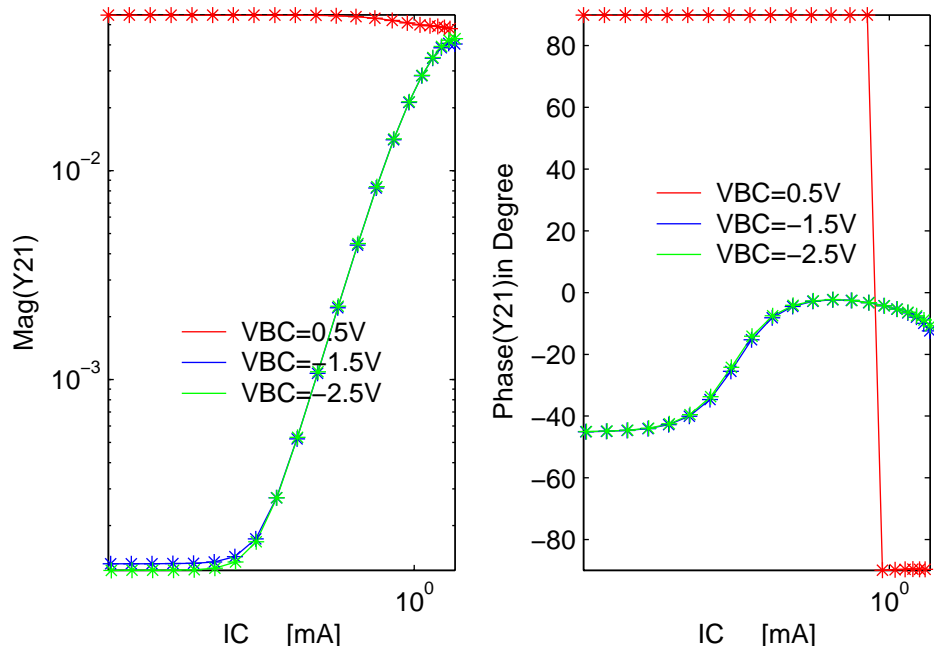


FIGURE 5. Y_{21} vs. IC plots at $f=2.8\text{GHz}$

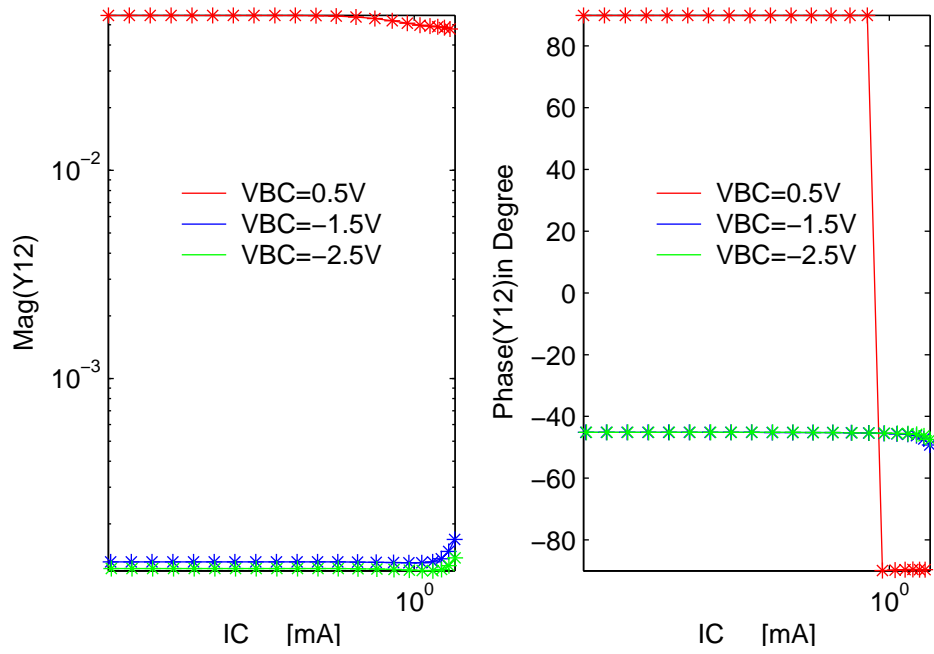


FIGURE 6. Y_{12} vs. IC plots at $f=2.8\text{GHz}$

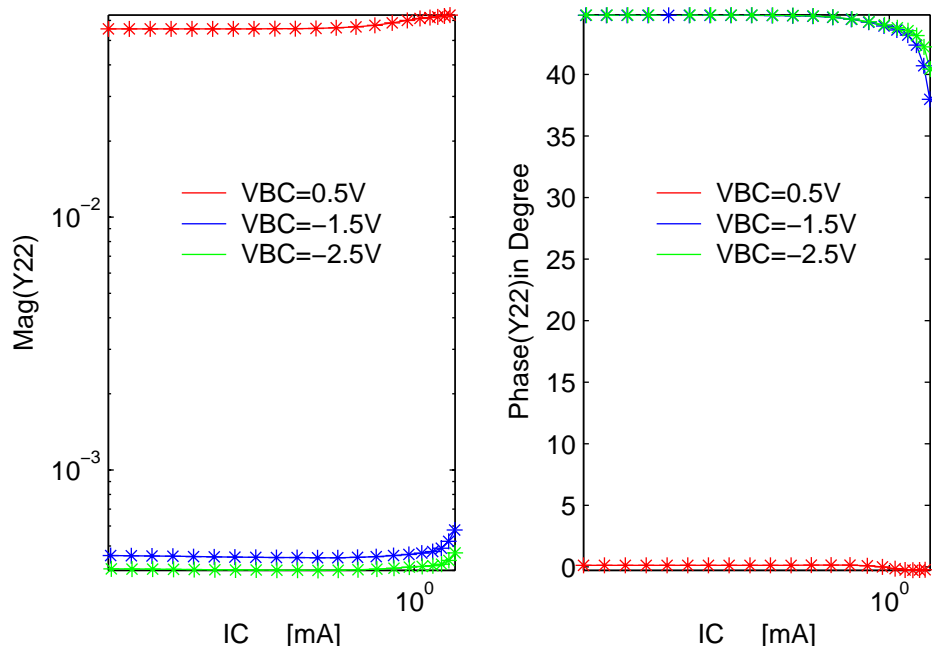


FIGURE 7. Y_{22} vs. I_C plots at $f=2.8\text{GHz}$

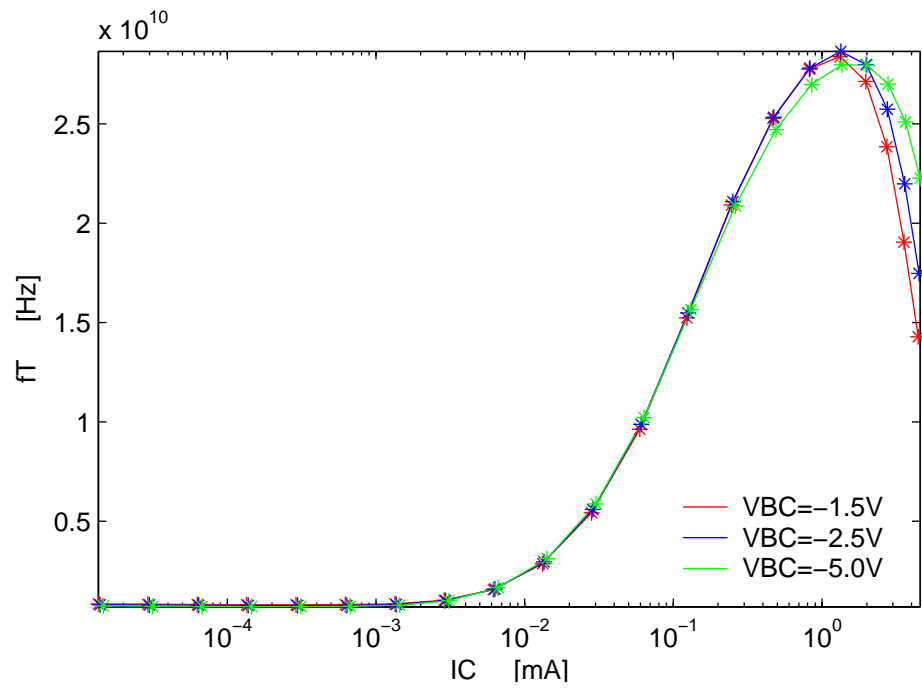


FIGURE 8. f_T vs. I_C plots at $f=2.8\text{GHz}$

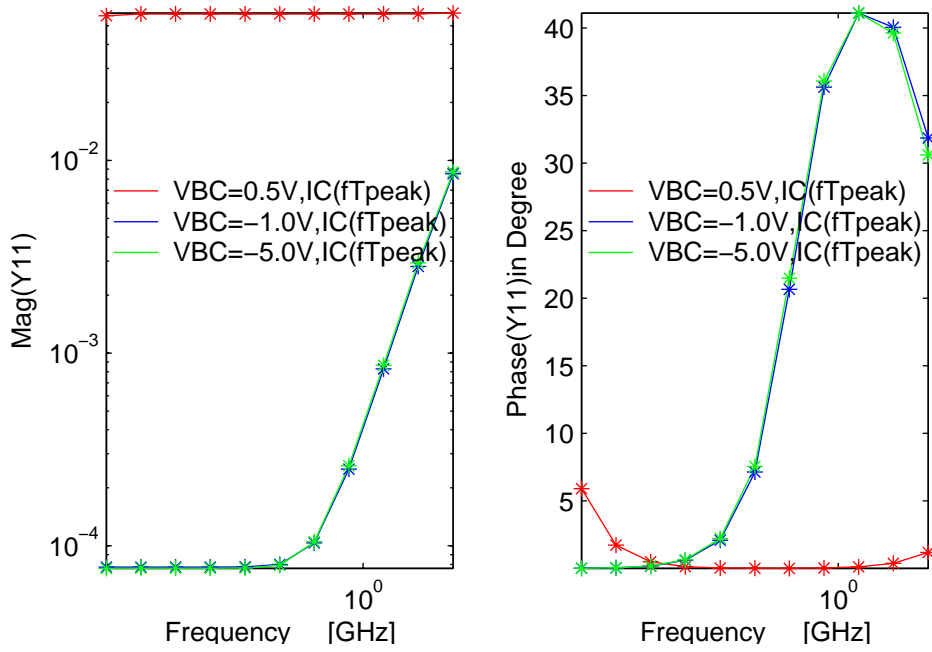


FIGURE 9. Y11 vs. Frequency plots

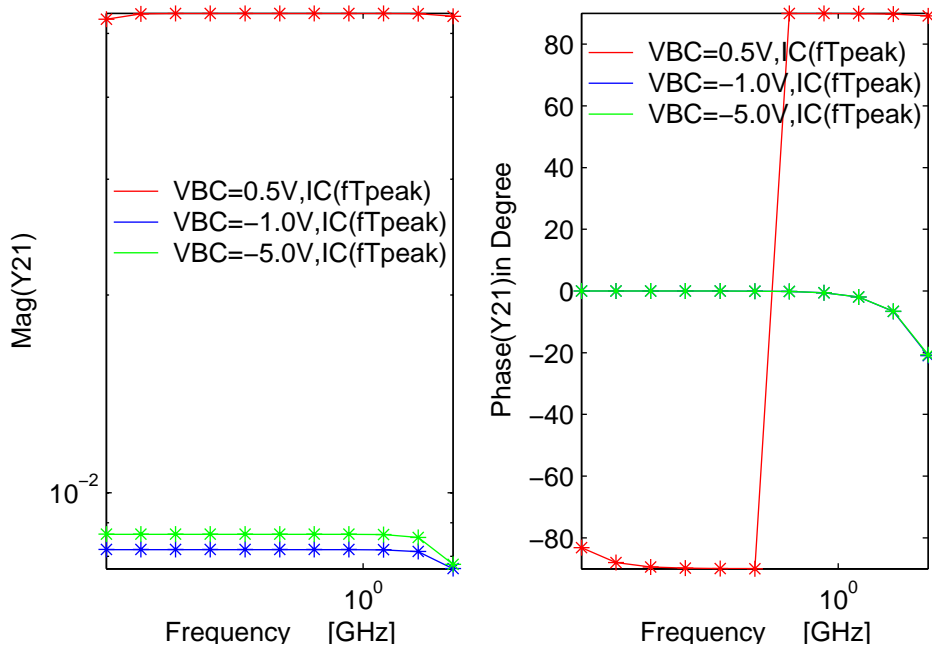


FIGURE 10. Y21 vs. Frequency plots

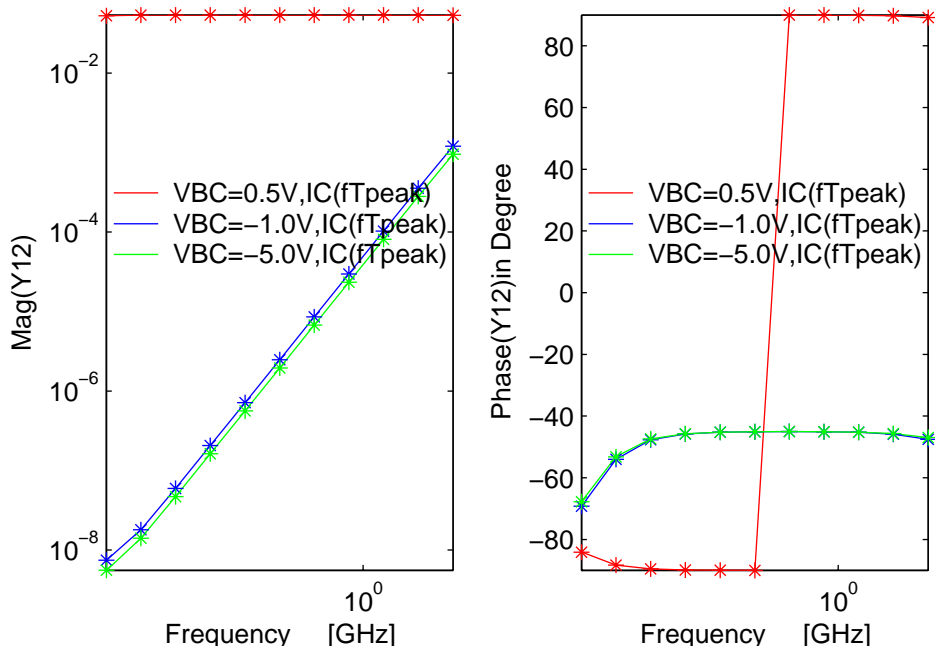


FIGURE 11. Y12 vs. Frequency plots

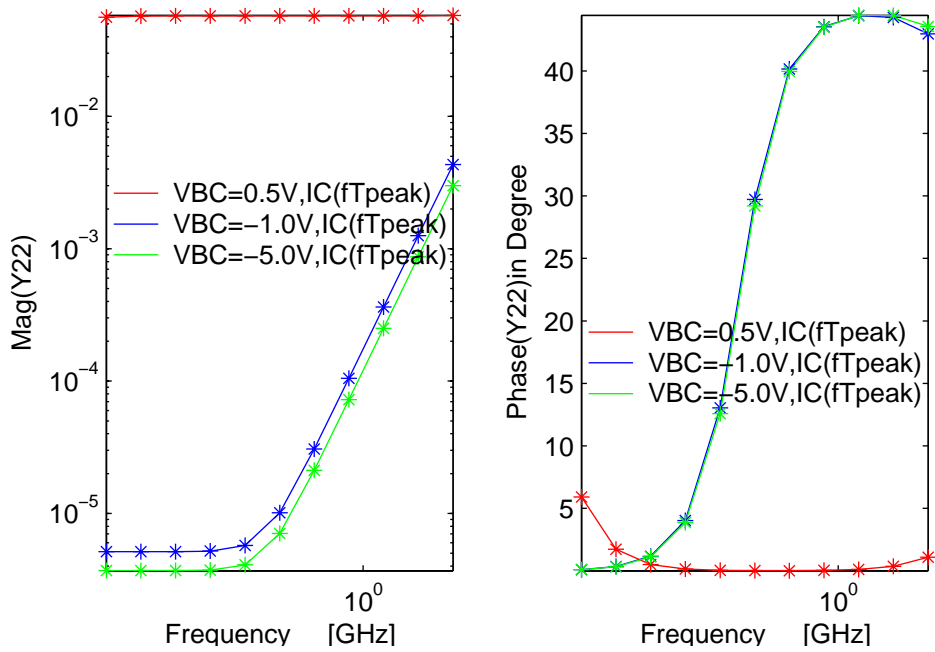


FIGURE 12. Y22 vs. Frequency plots

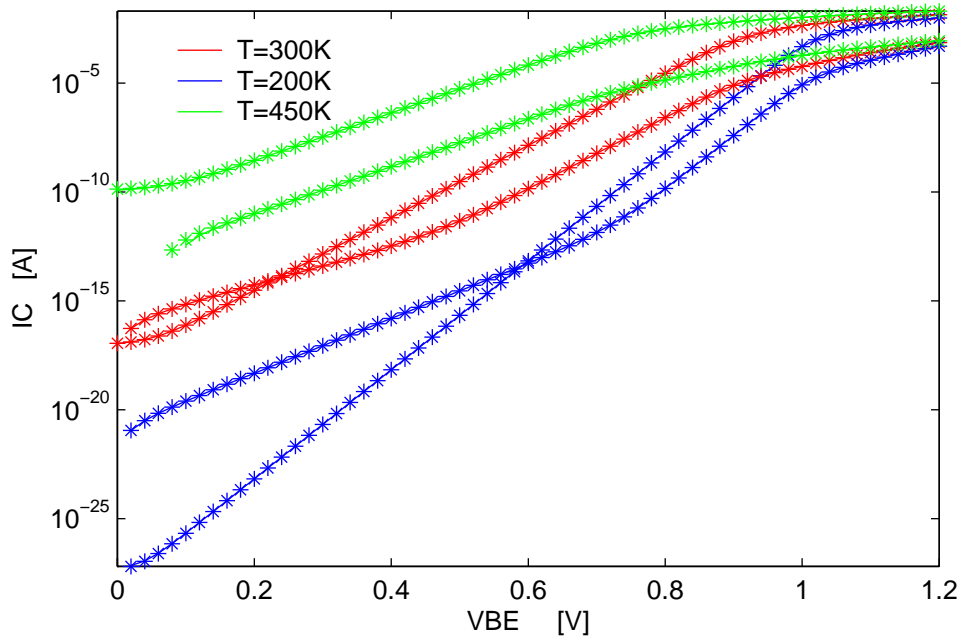


FIGURE 13. IC vs. VBE at different temperatures

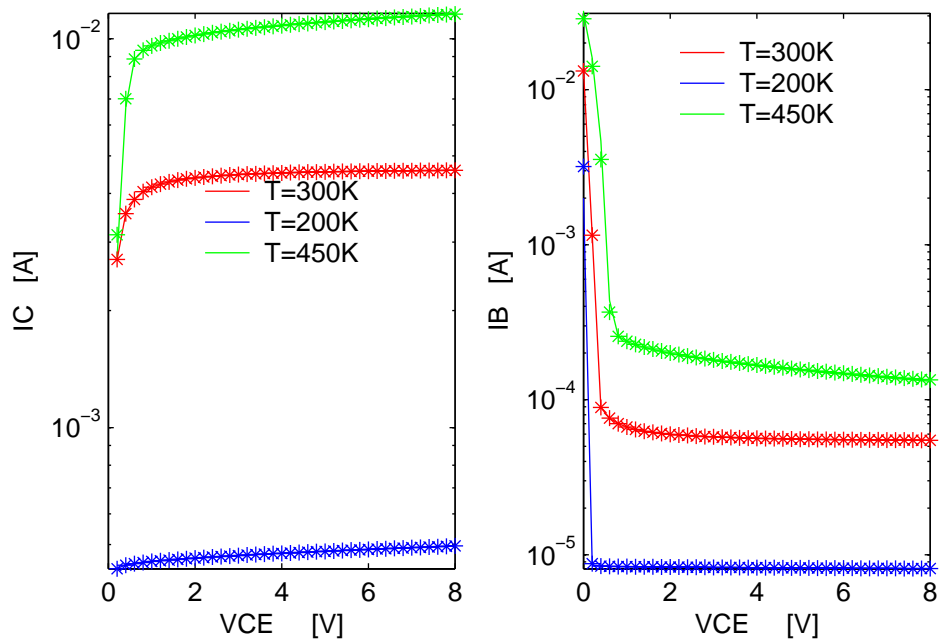


FIGURE 14. IC vs. VCE plot (VBE=0.8V) at different temperatures

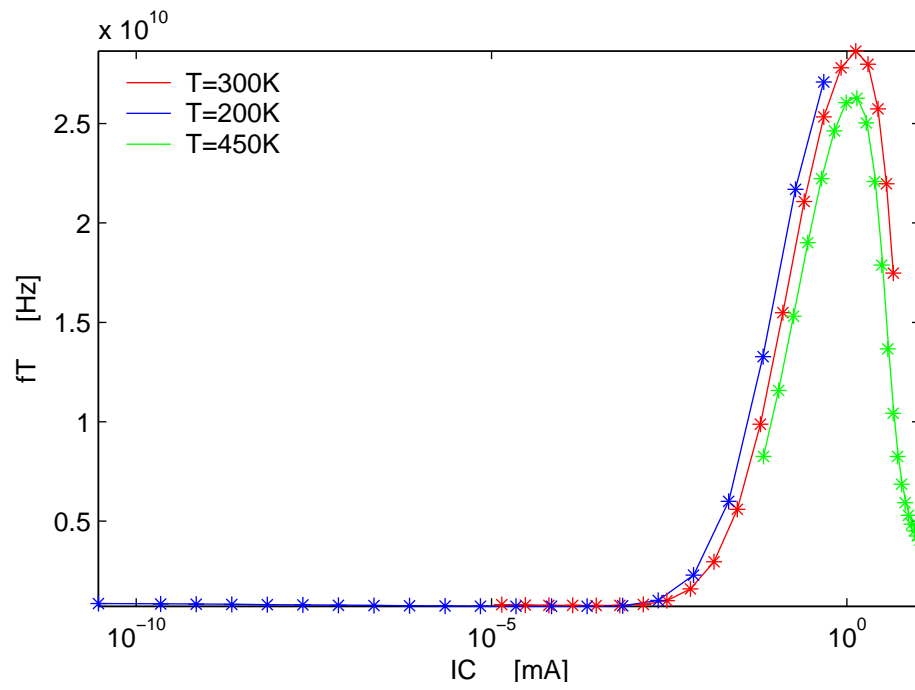


FIGURE 15. f_T vs. I_C plots at different temperatures at $f=2.8\text{GHz}$