Test Results of HICUM Level 2V2.11

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The corresponding ASCII data may be found in the HICUM website. Any modification of the code and corresponding results will be updated with newer version names.

ASCII file nomenclature:

General format: Netlist_name_x_y.elpa

where,

y=1: T=300K

y=2: T=200K

y=3: T=400K

y=4: T=600K

y=5: Electrothermal/Self-heating effect

y=6: NQS effect (Not available)

y=7: Collector current spreading effect

y=8: Substrate transistor effect without substrate network

y=9: Effects with substrate transistors and substrate network

and

x=1: Intrinsic transistor

x=2: Internal Transistor:

Thermal data for x=2:

y=3: T=200K, y=4: T=400K, y=5: T=600K, y=6: T=300K.

x=3: Complete transistor

Section 1: Results of Intrinsic Transistor

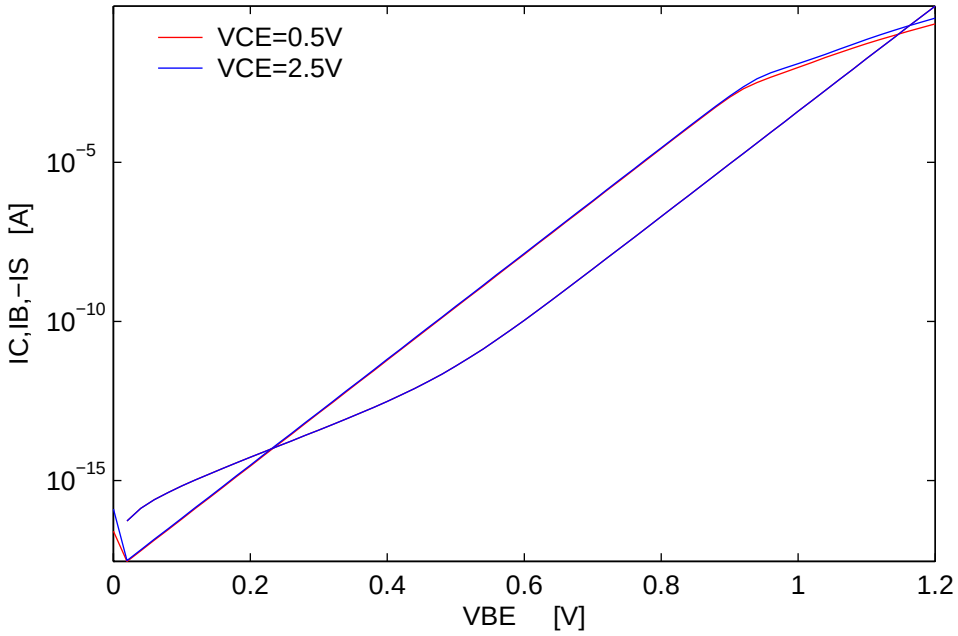

FIGURE 1. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K.

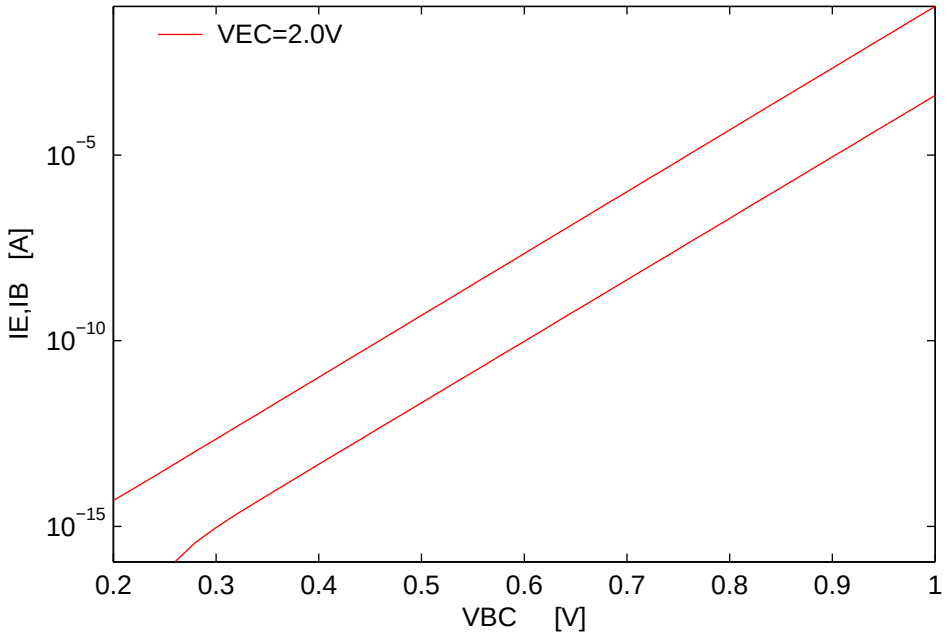

FIGURE 2. Reverse Gummel plots at VEC=2.0V at T=300K.

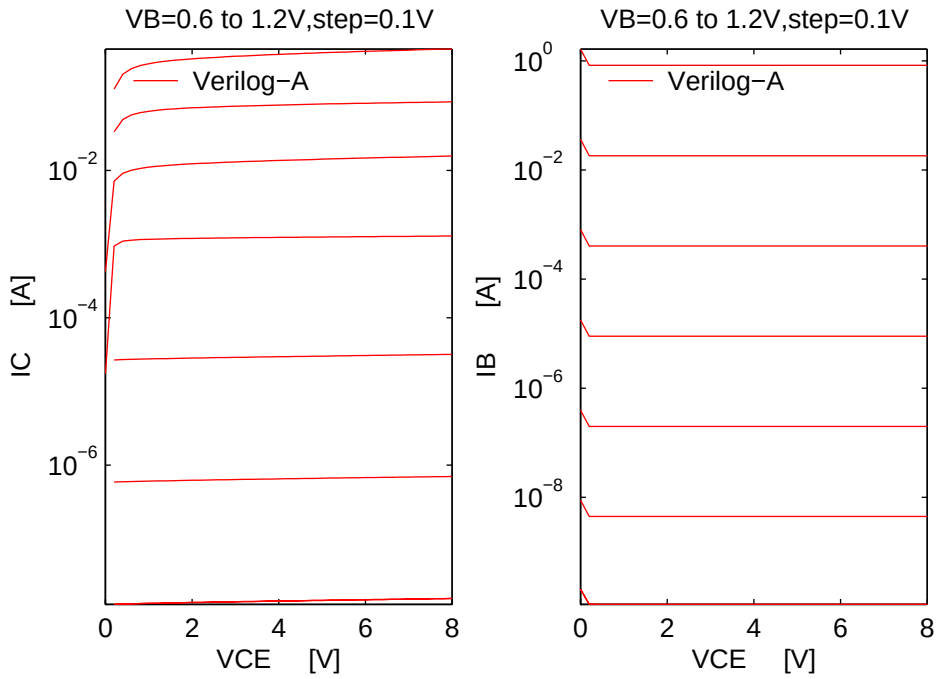

FIGURE 3. Forced-VB output characteristics and Ib-VCE plots at T=300K.

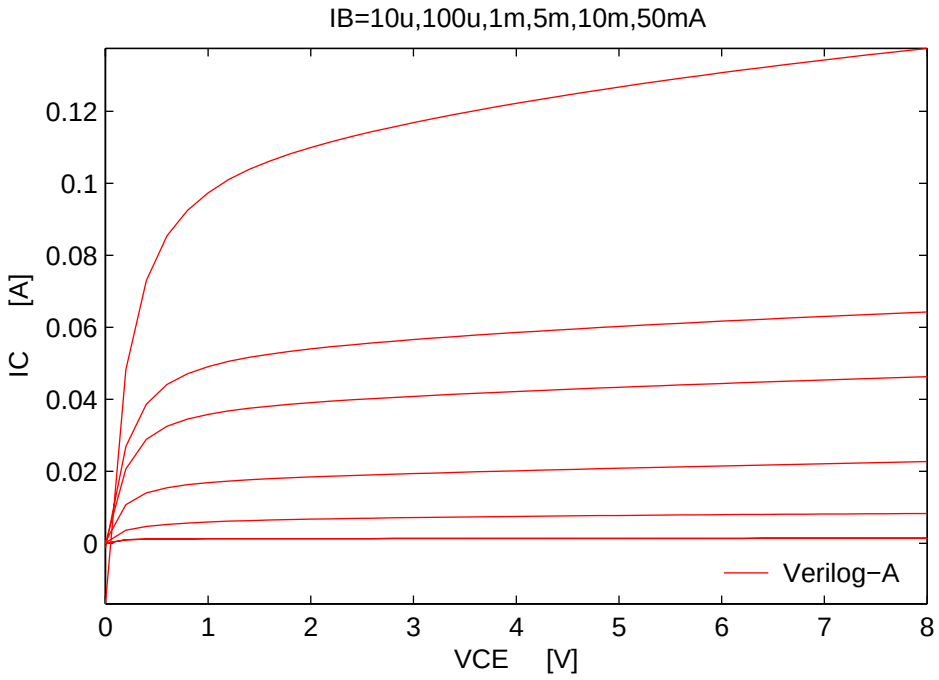

FIGURE 4. Forced-IB output characteristics at T=300K.

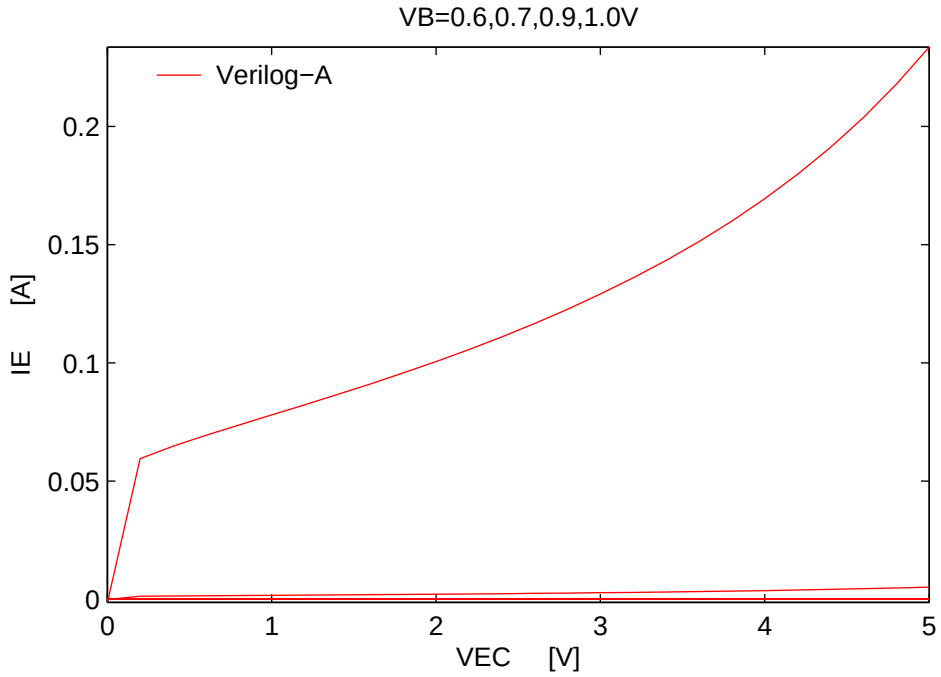

FIGURE 5. Reverse output characteristics at T=300K.

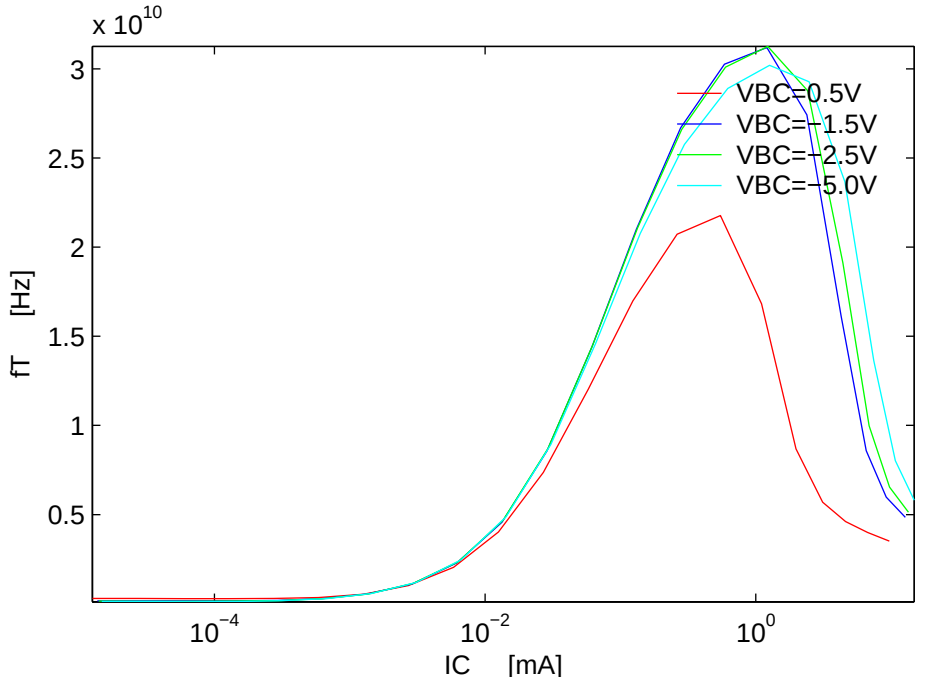

FIGURE 6. f_T(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, f_T extracted at f=2.8GHz.

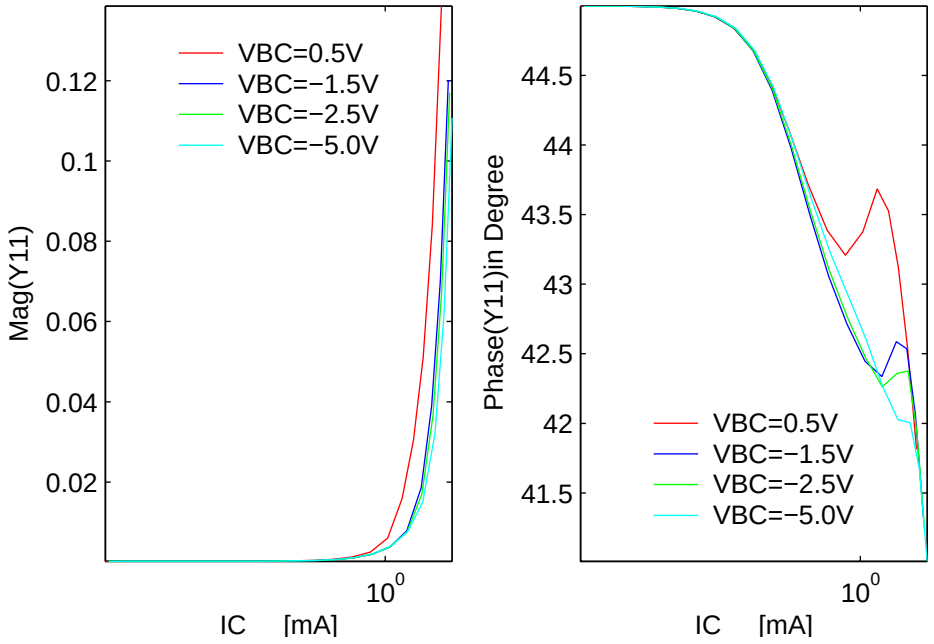

FIGURE 7. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

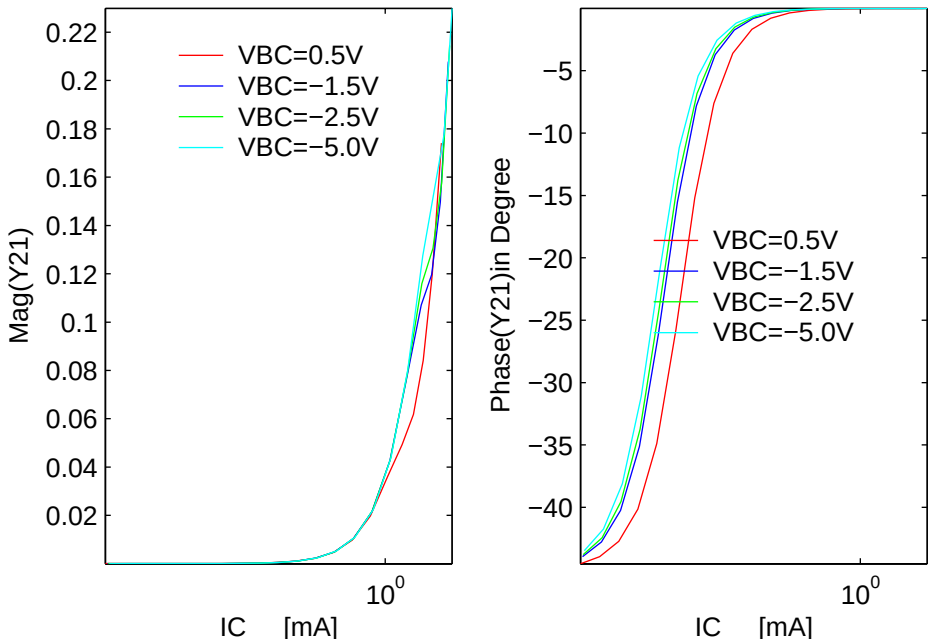

FIGURE 8. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

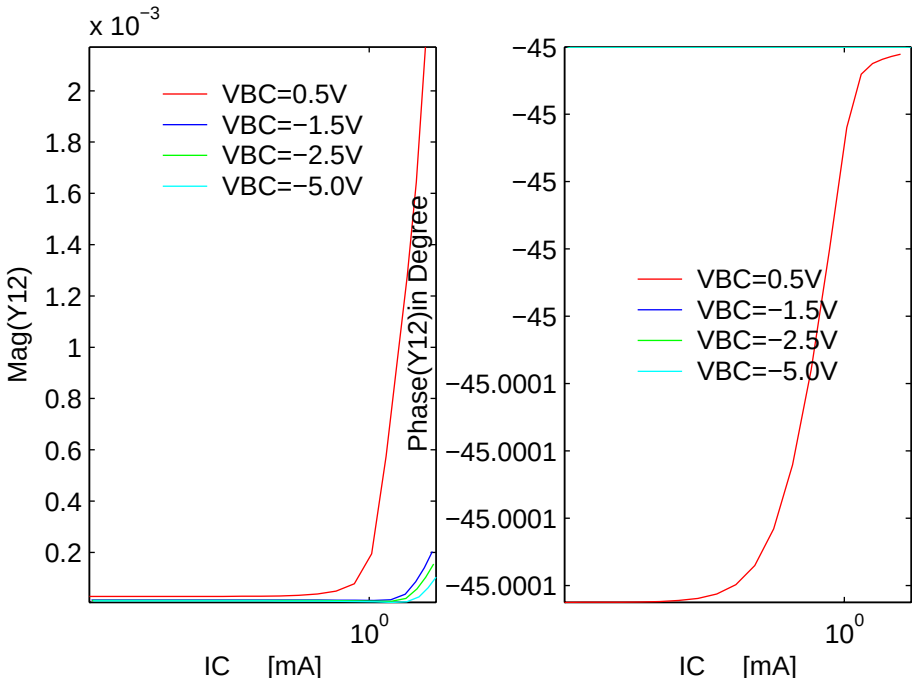

FIGURE 9. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

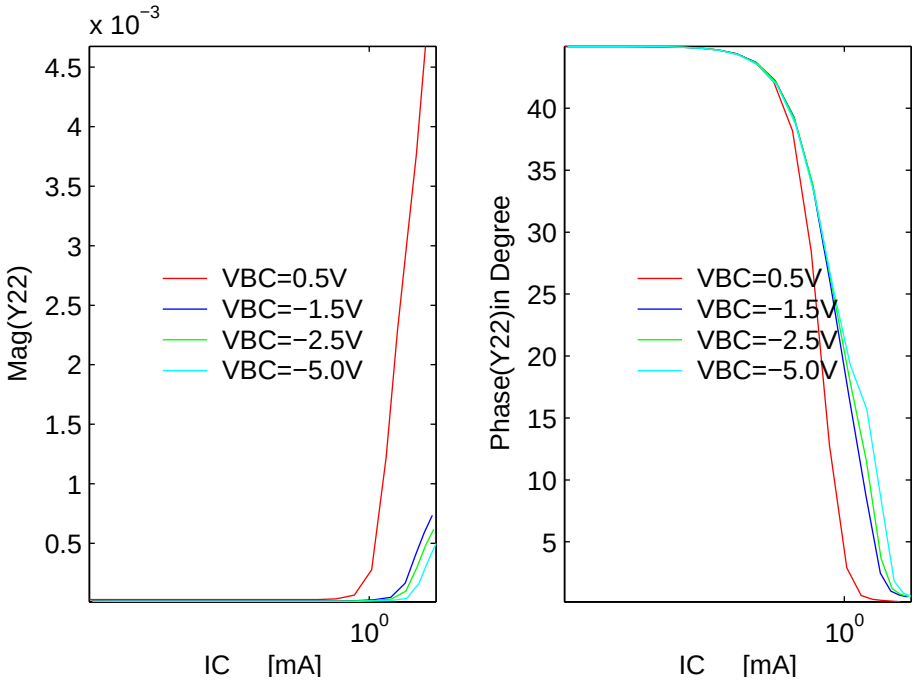

FIGURE 10. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

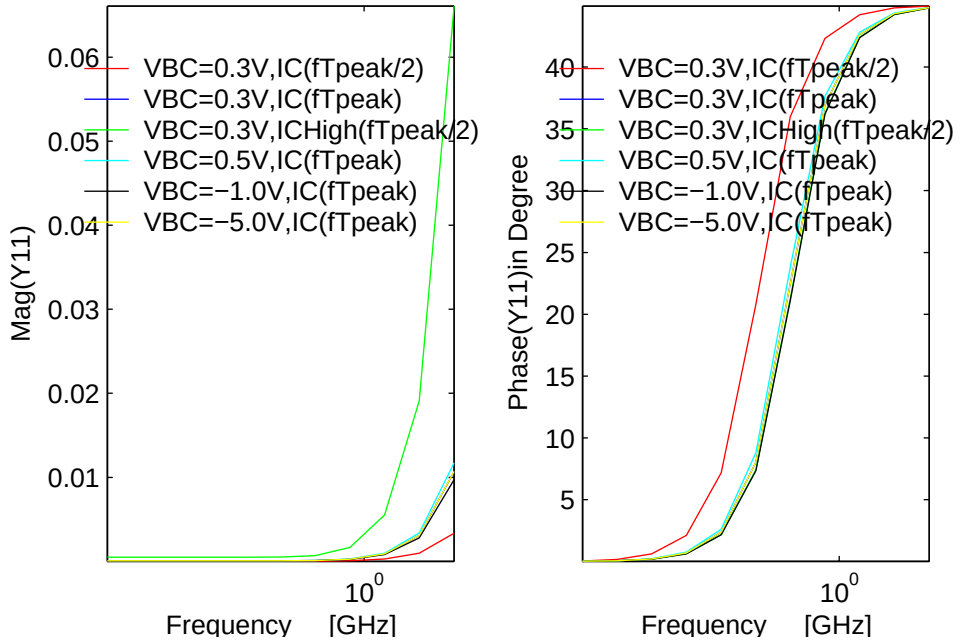

FIGURE 11. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

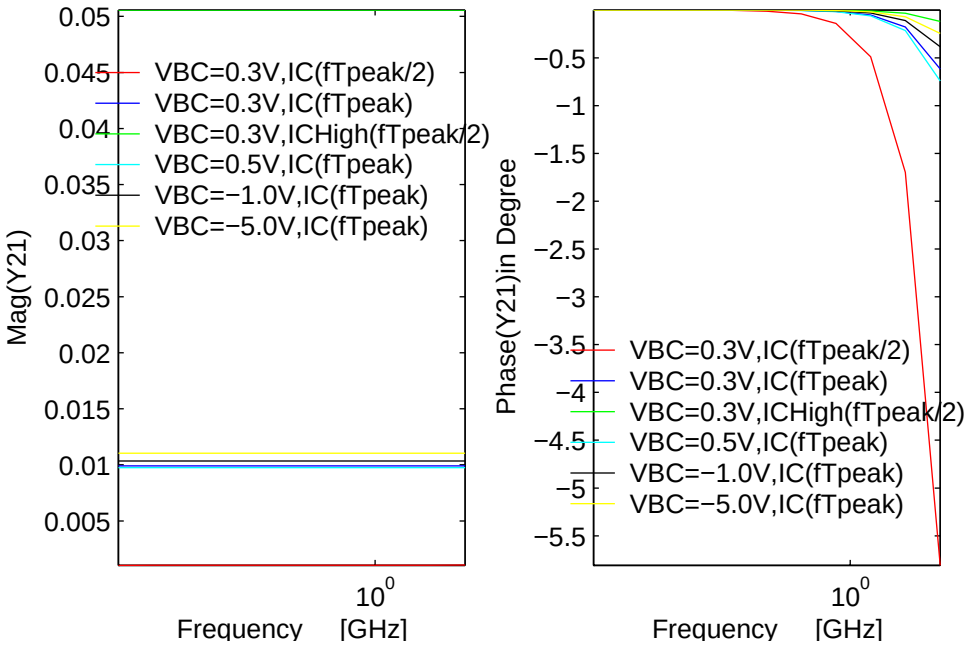

FIGURE 12. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

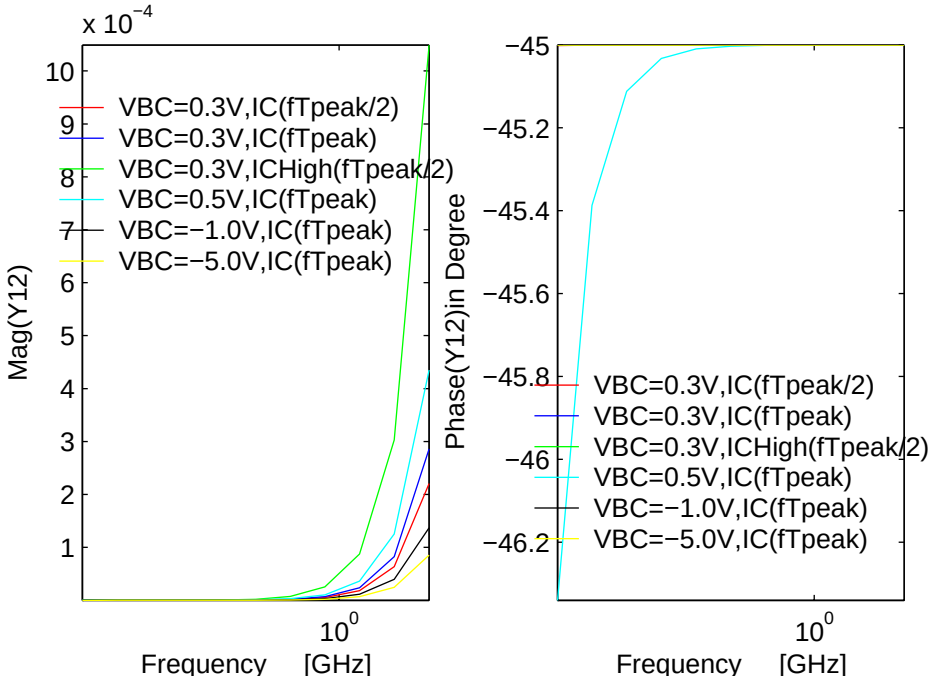

FIGURE 13. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

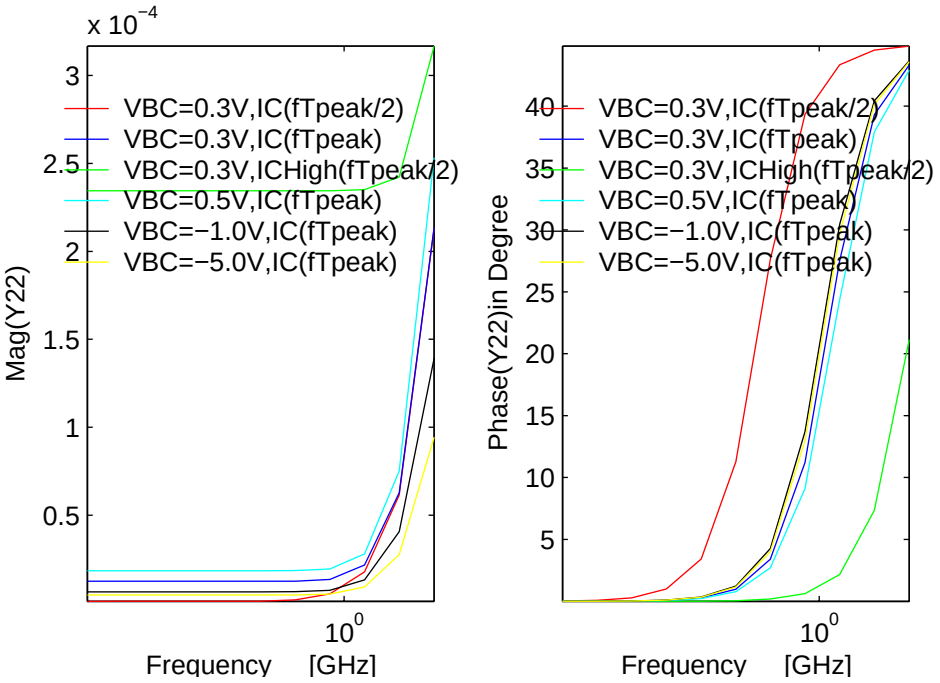

FIGURE 14. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

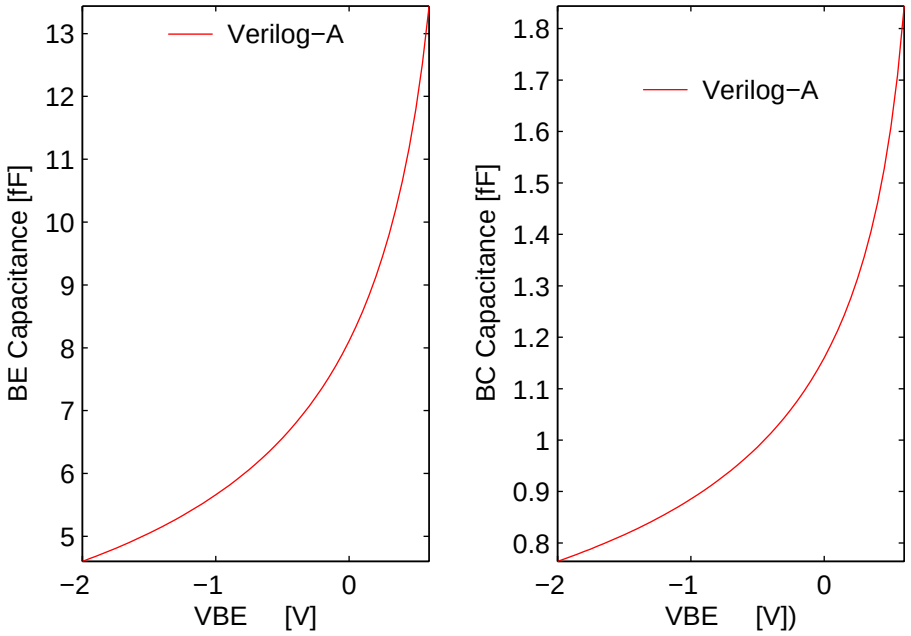

FIGURE 15. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K.

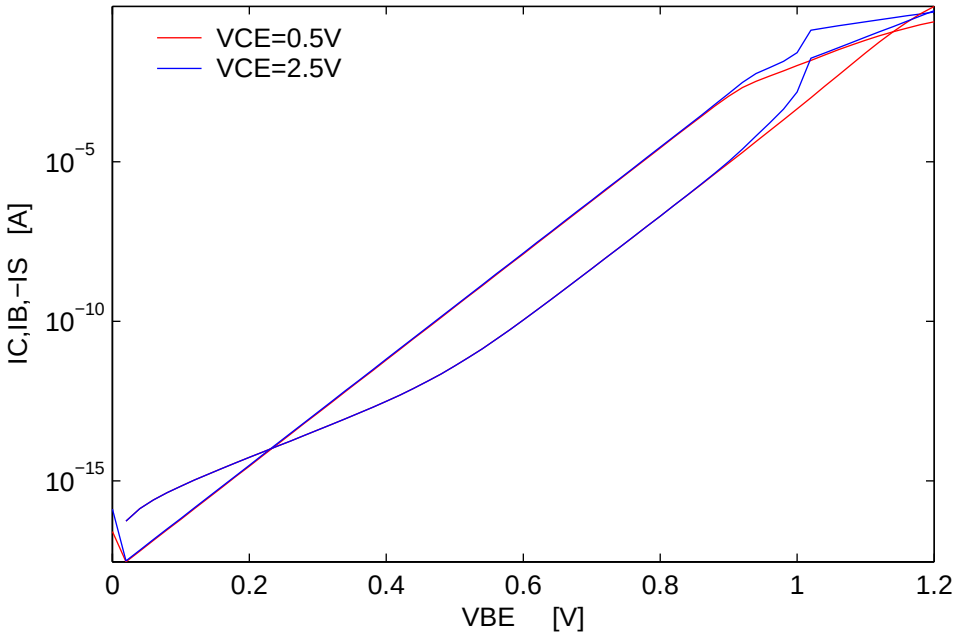

FIGURE 16. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with self-heating effect.

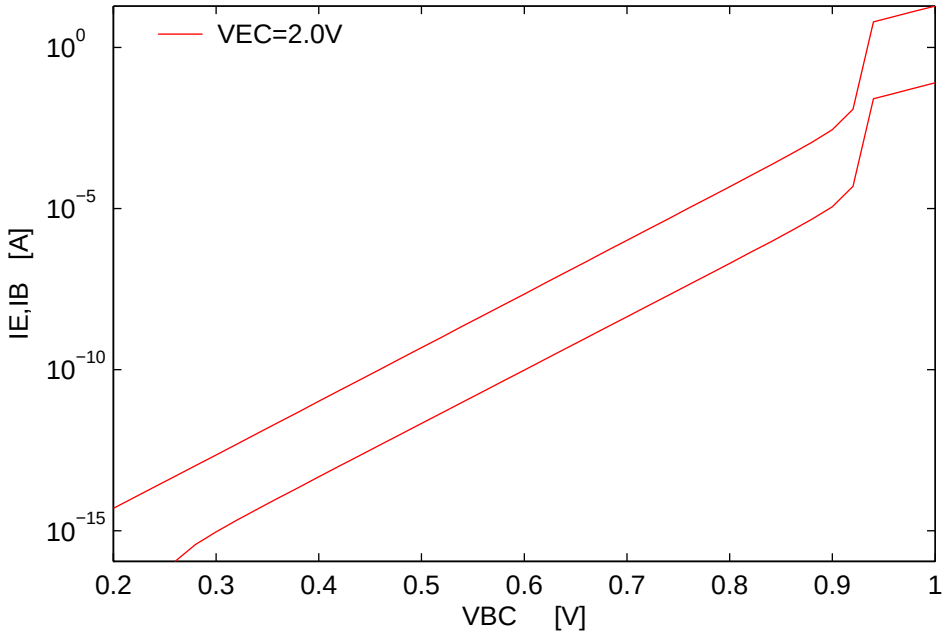

FIGURE 17. Reverse Gummel plots at VEC=2.0V at T=300K with self-heating effect.

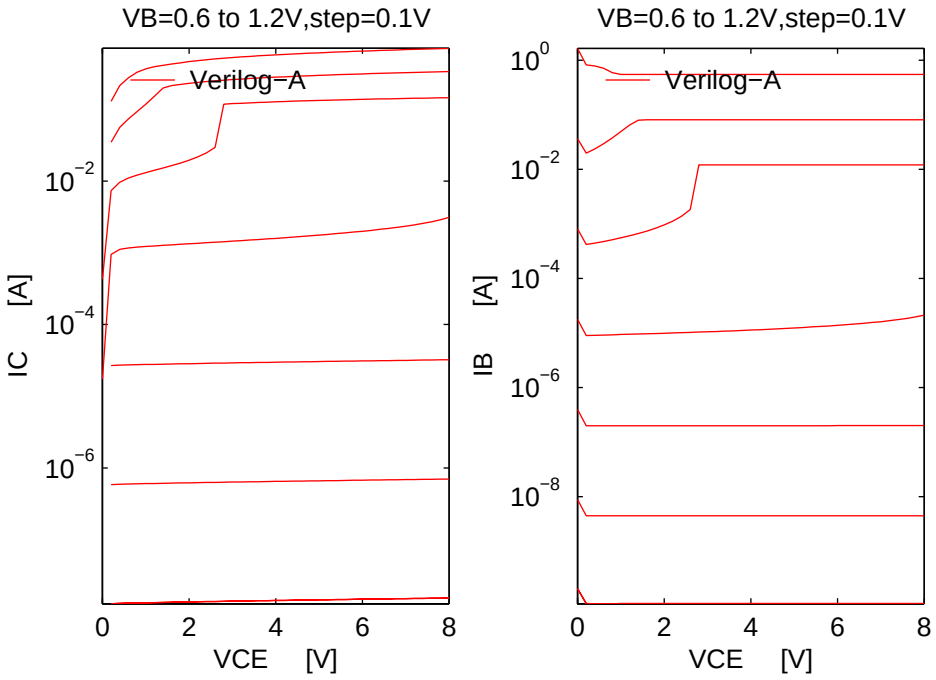

FIGURE 18. Forced-VB output characteristics and Ib-VCE plots at T=300K with self-heating effect.

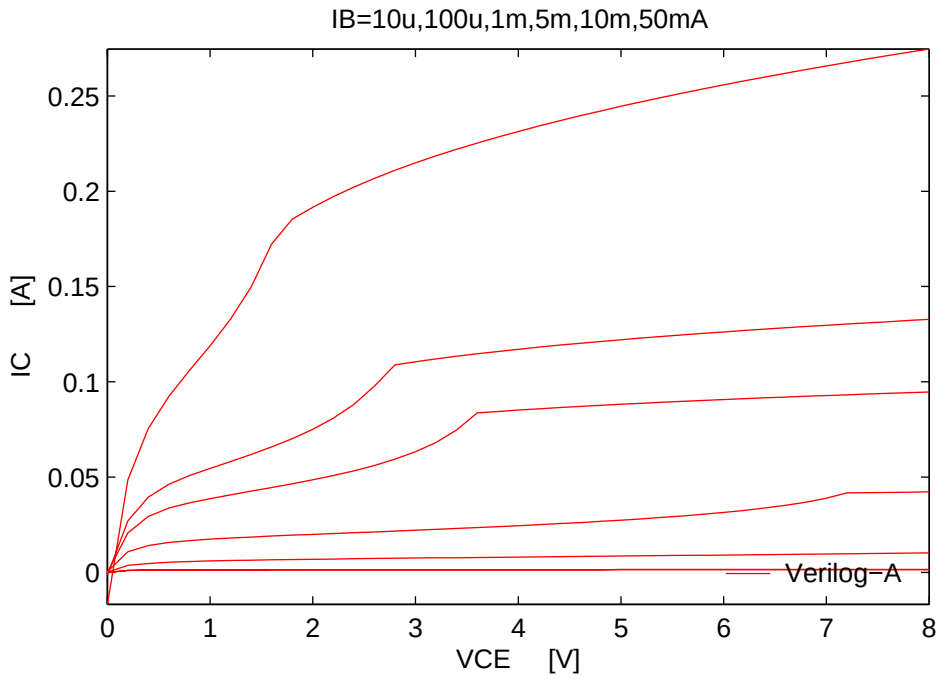

FIGURE 19. Forced-IB output characteristics at T=300K with self-heating effect.

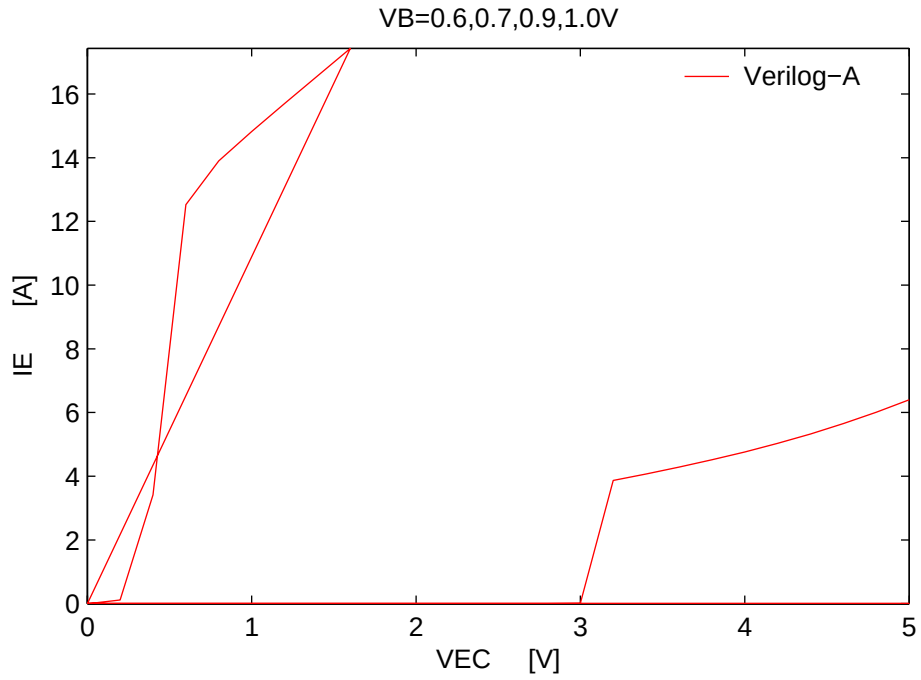

FIGURE 20. Reverse output characteristics at T=300K with self-heating effect .

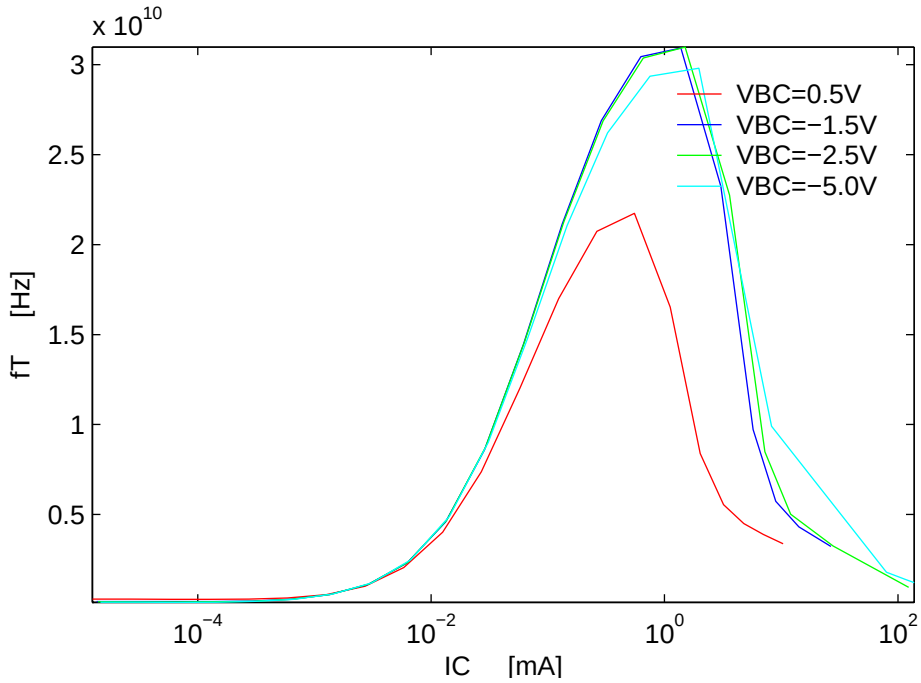

FIGURE 21. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with self-heating effect.

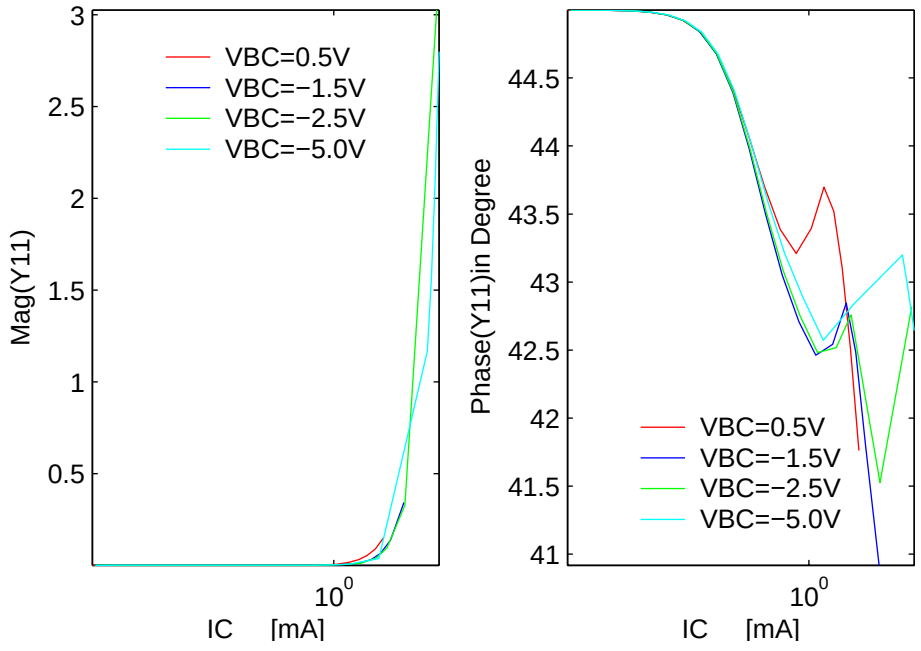

FIGURE 22. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

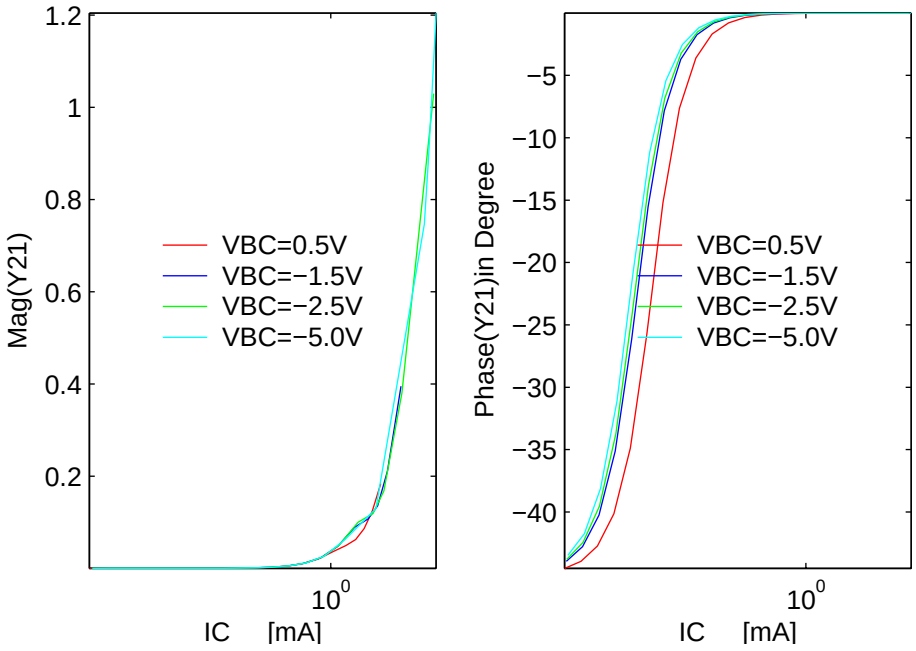

FIGURE 23. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

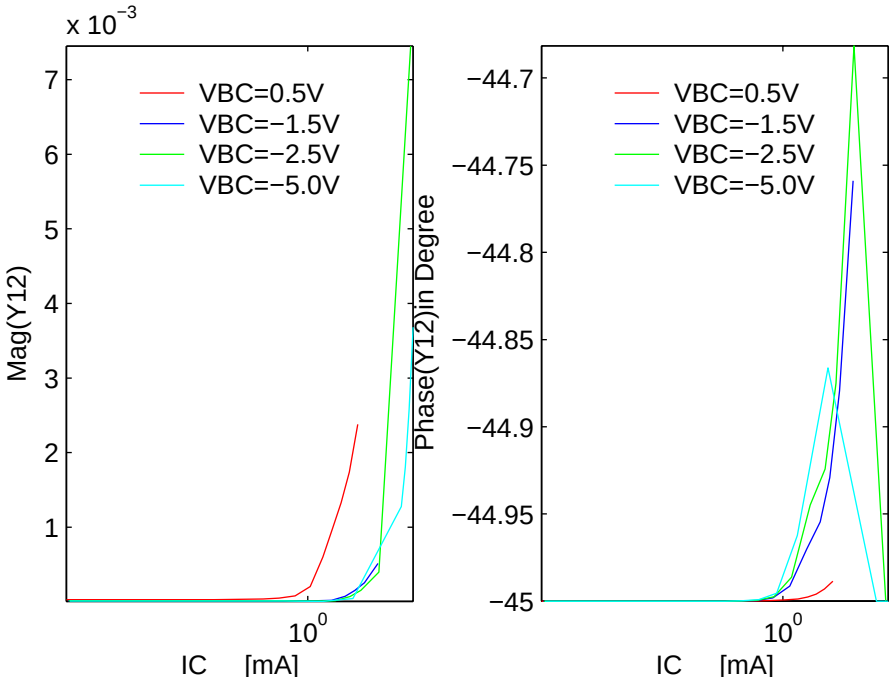

FIGURE 24. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

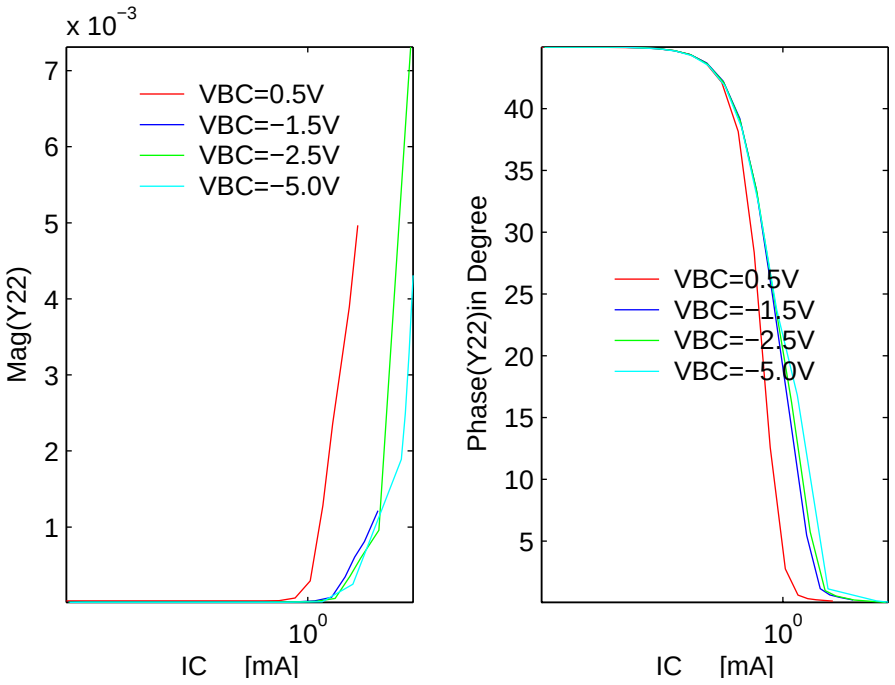

FIGURE 25. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

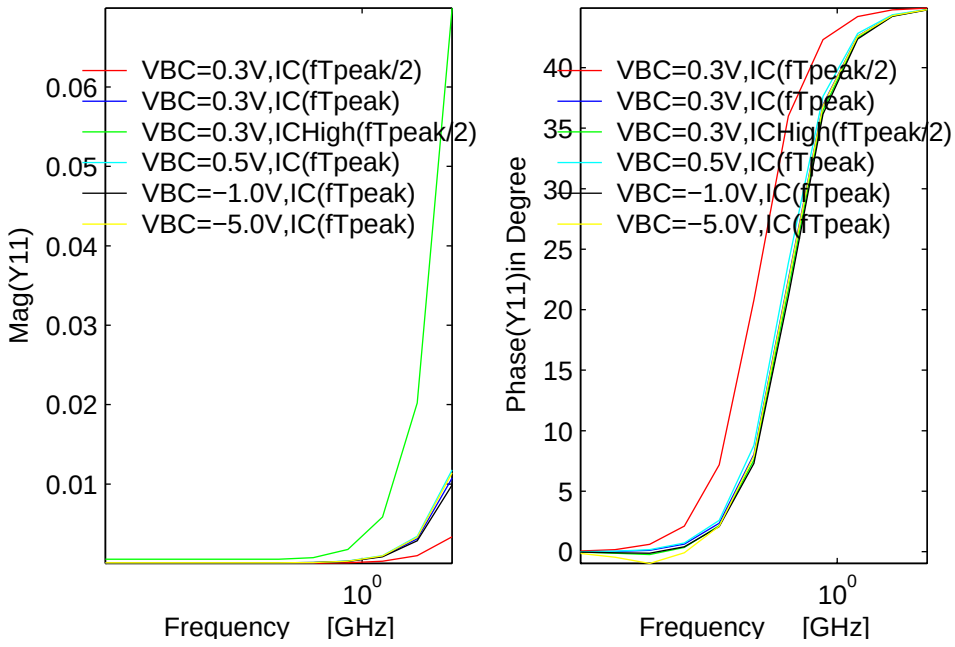

FIGURE 26. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

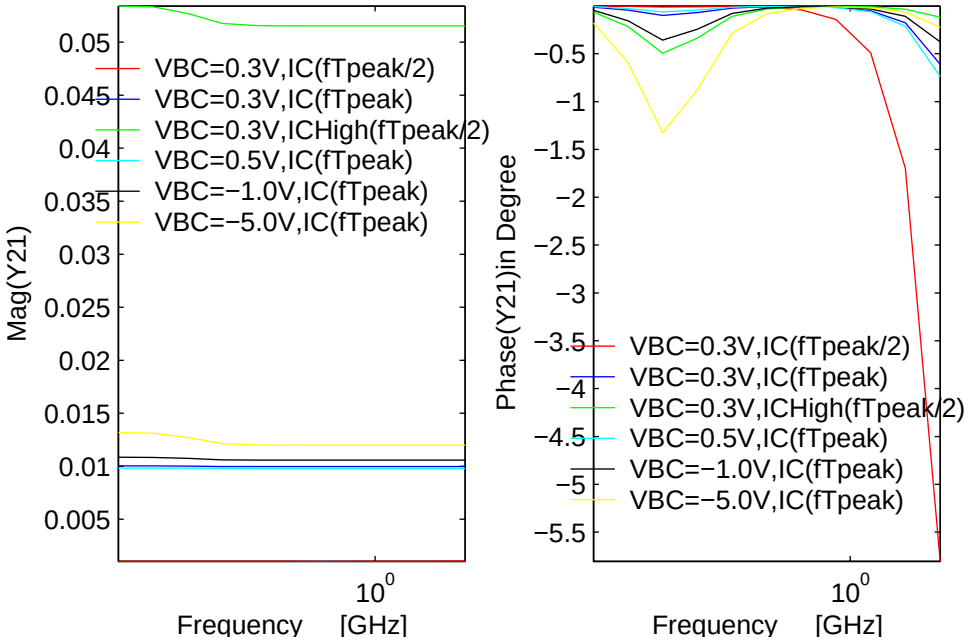

FIGURE 27. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

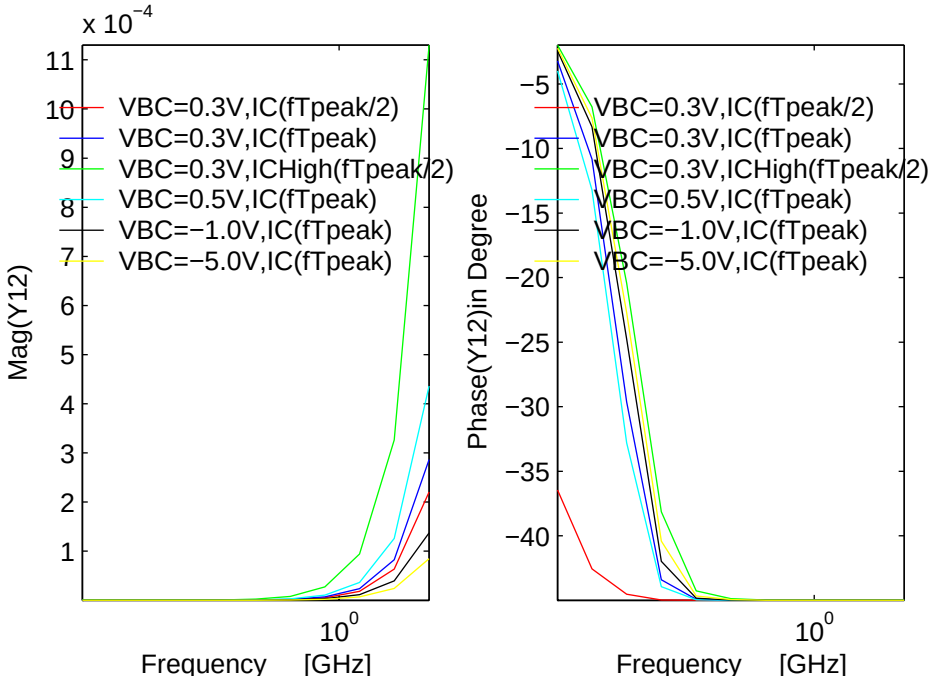

FIGURE 28. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

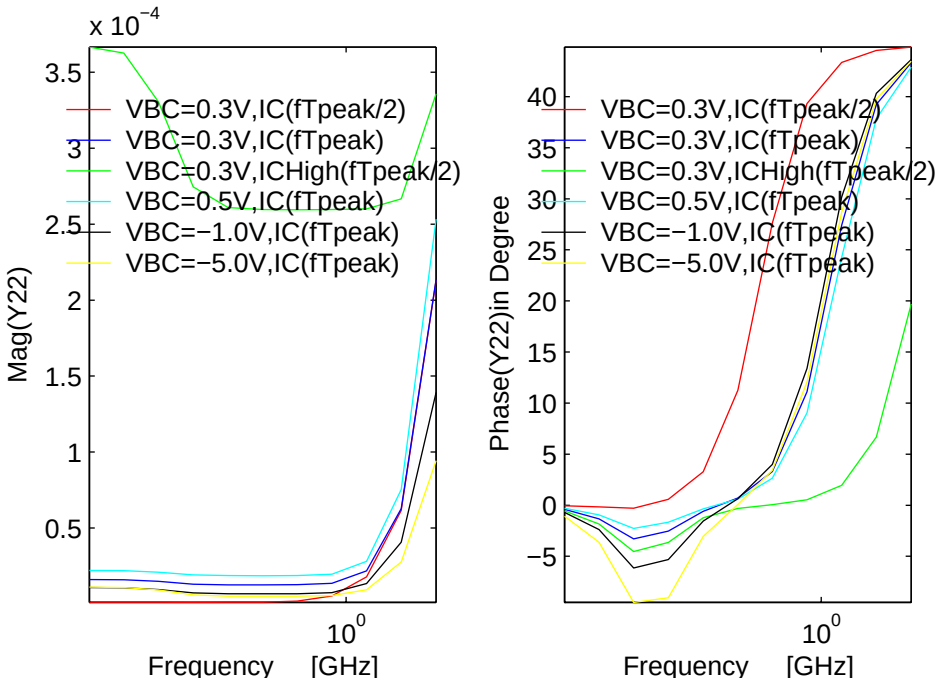

FIGURE 29. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

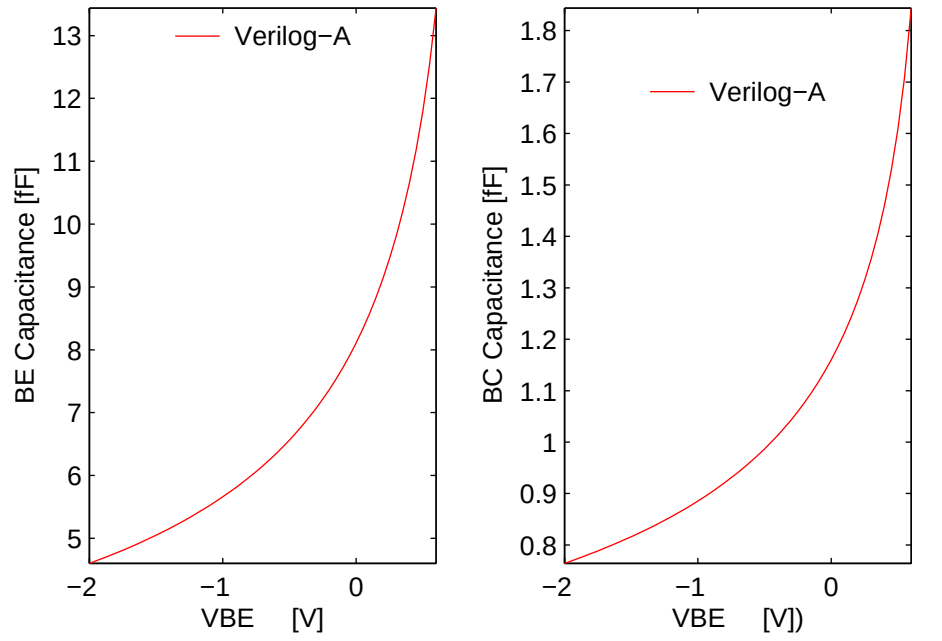

FIGURE 30. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with self-heating effect.

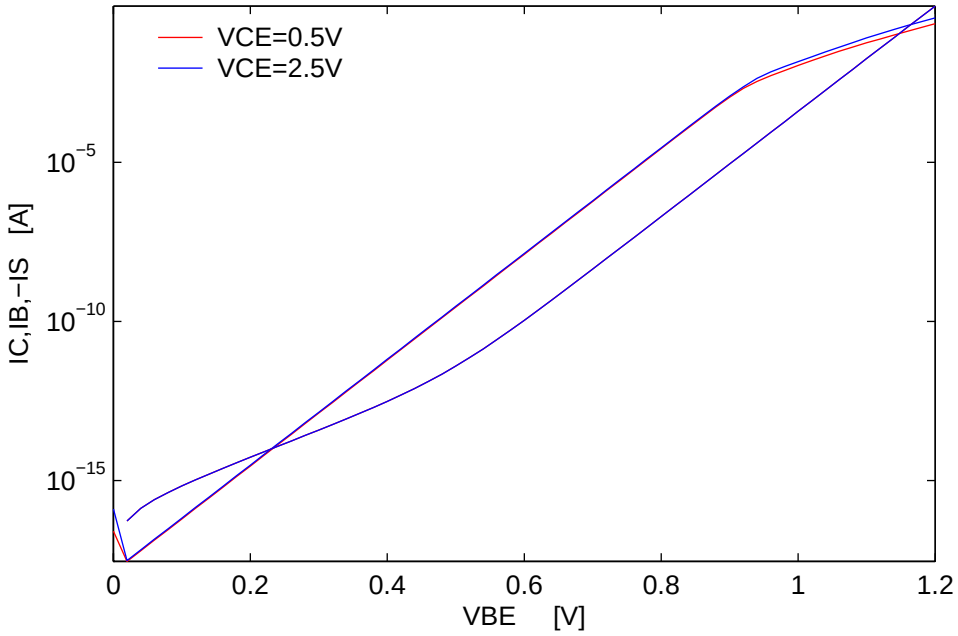

FIGURE 31. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with collector current spreading effect.

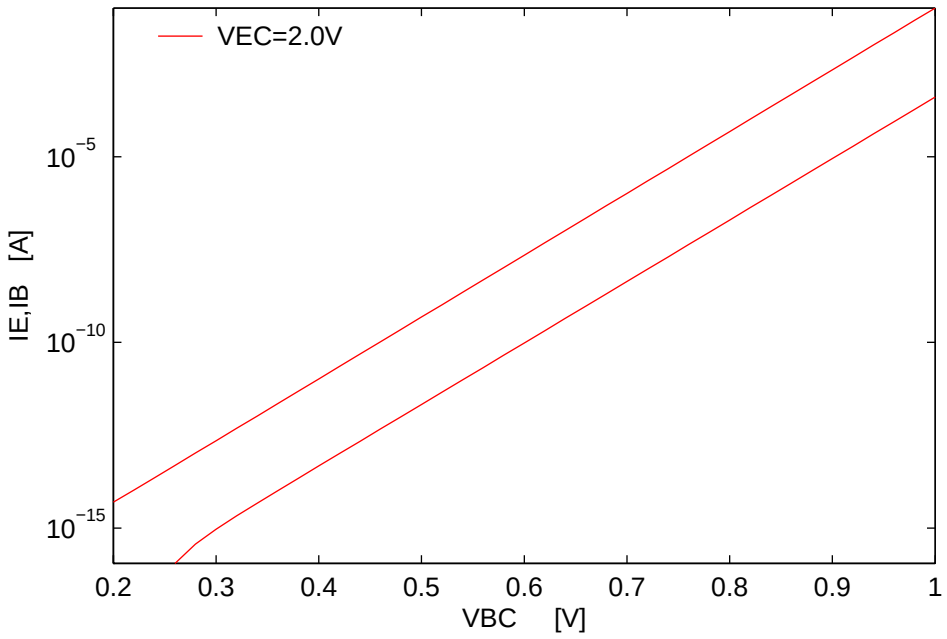

FIGURE 32. Reverse Gummel plots at VEC=2.0V at T=300K with collector current spreading effect.

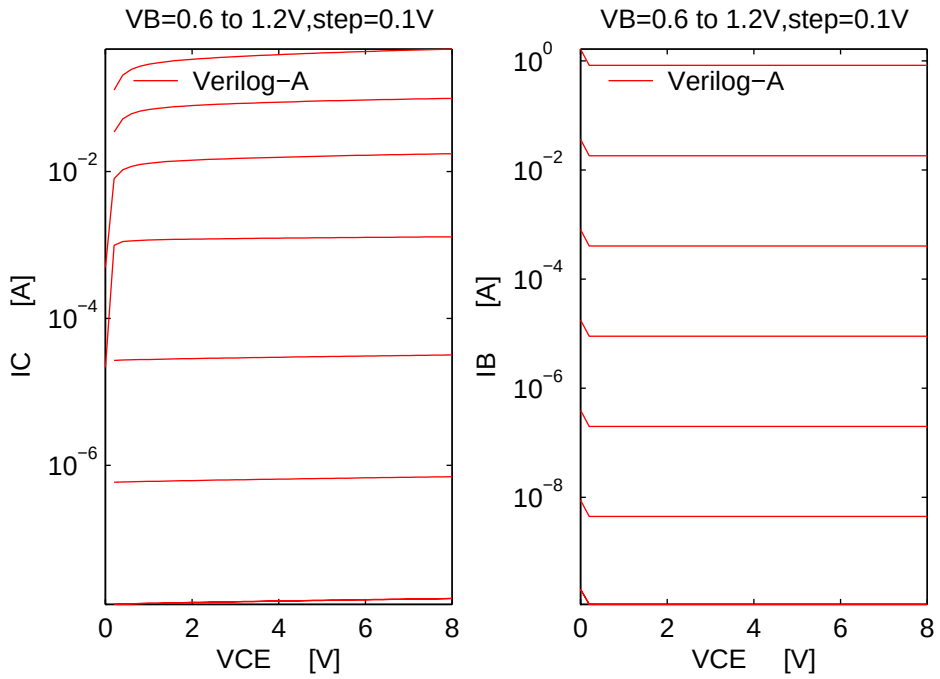

FIGURE 33. Forced-VB output characteristics and Ib-VCE plots at T=300K with collector current spreading effect.

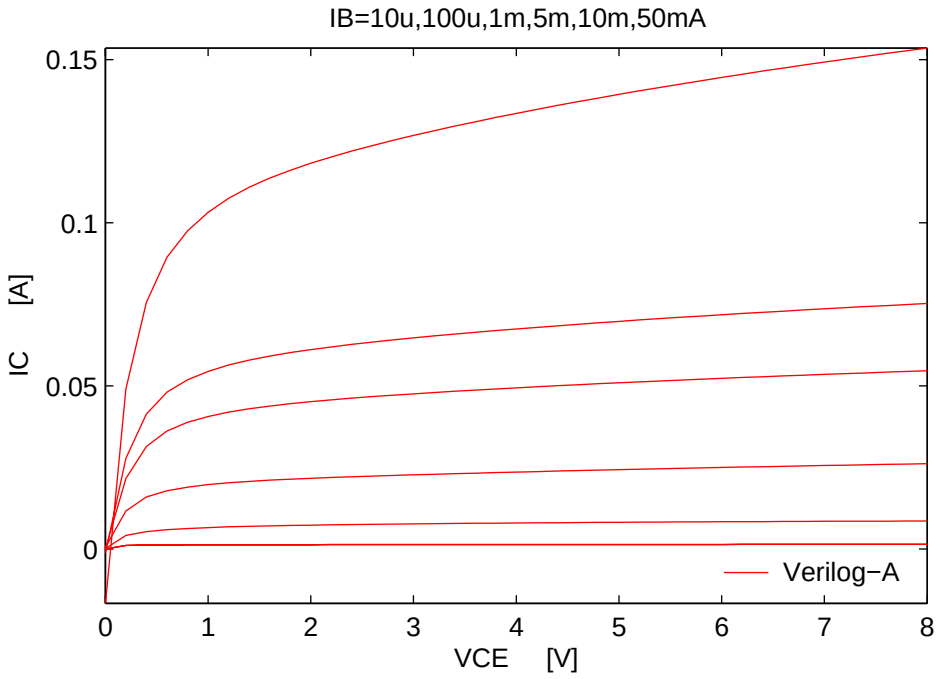

FIGURE 34. Forced-IB output characteristics at T=300K with collector current spreading effect.

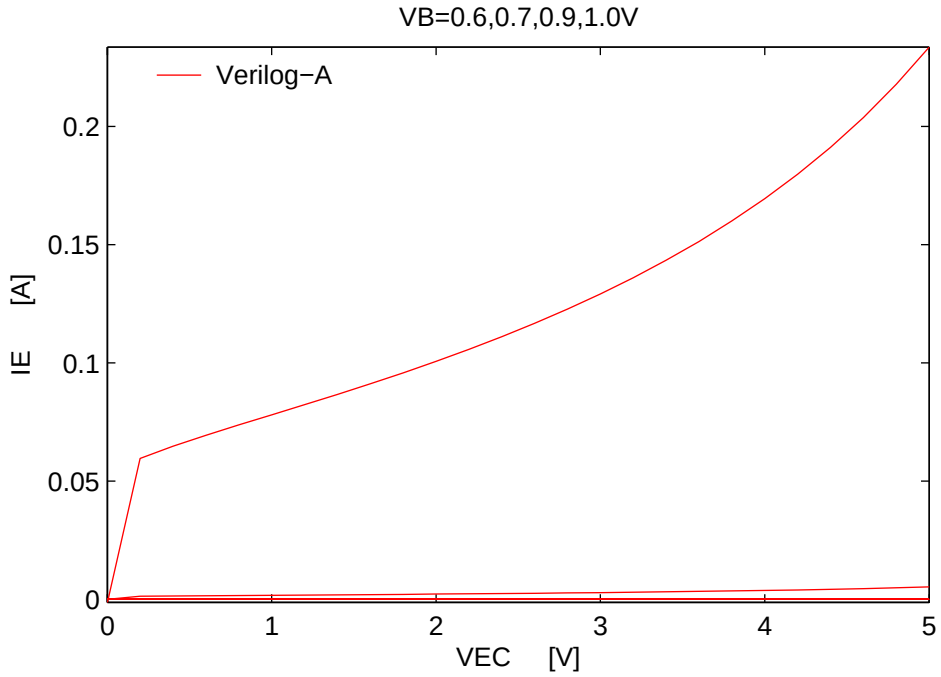

FIGURE 35. Reverse output characteristics at T=300K with collector current spreading effect.

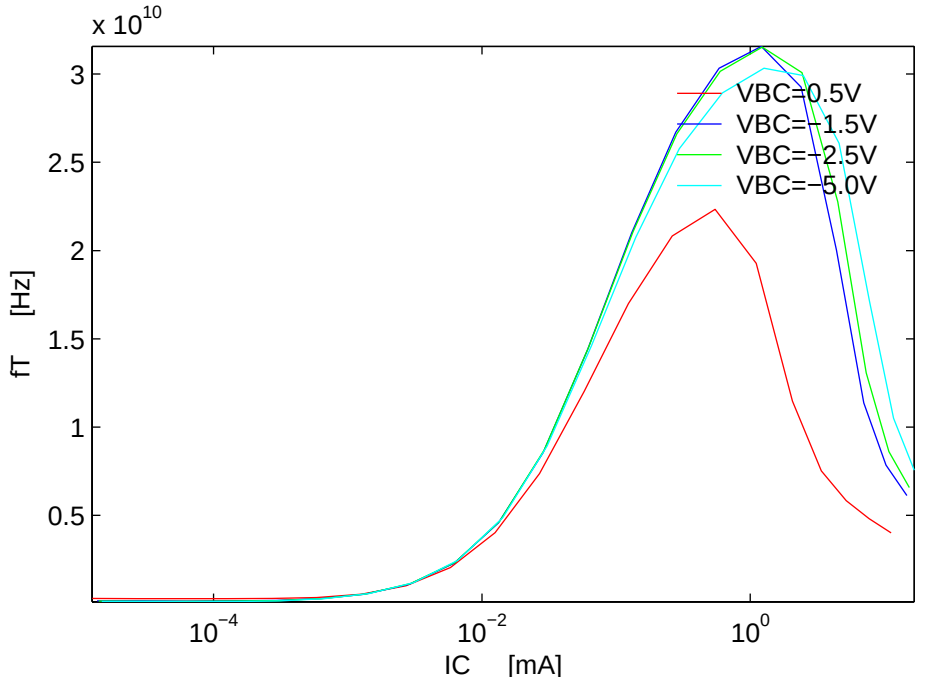

FIGURE 36. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with collector current spreading effect.

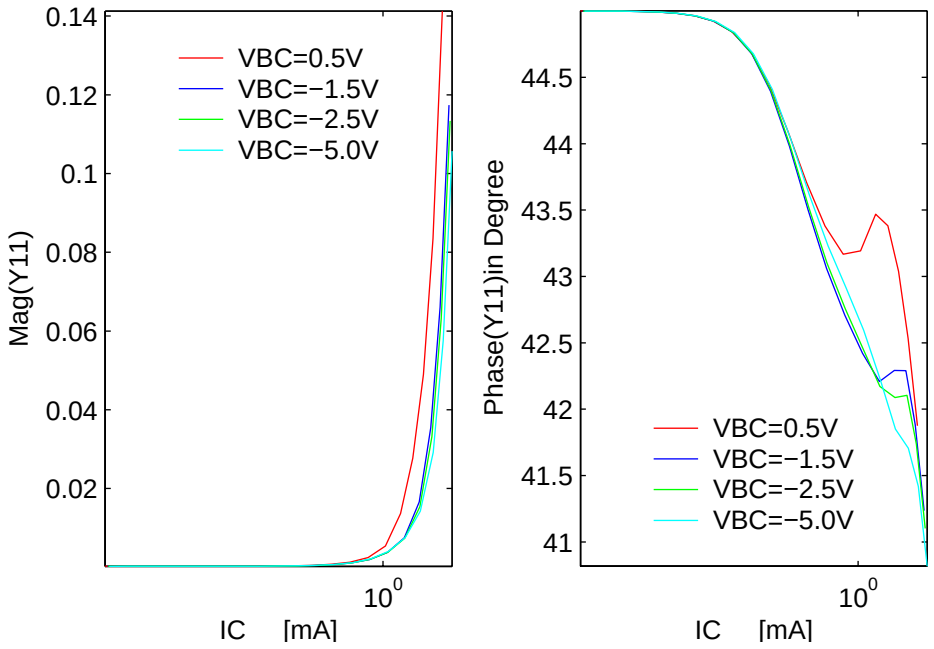

FIGURE 37. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

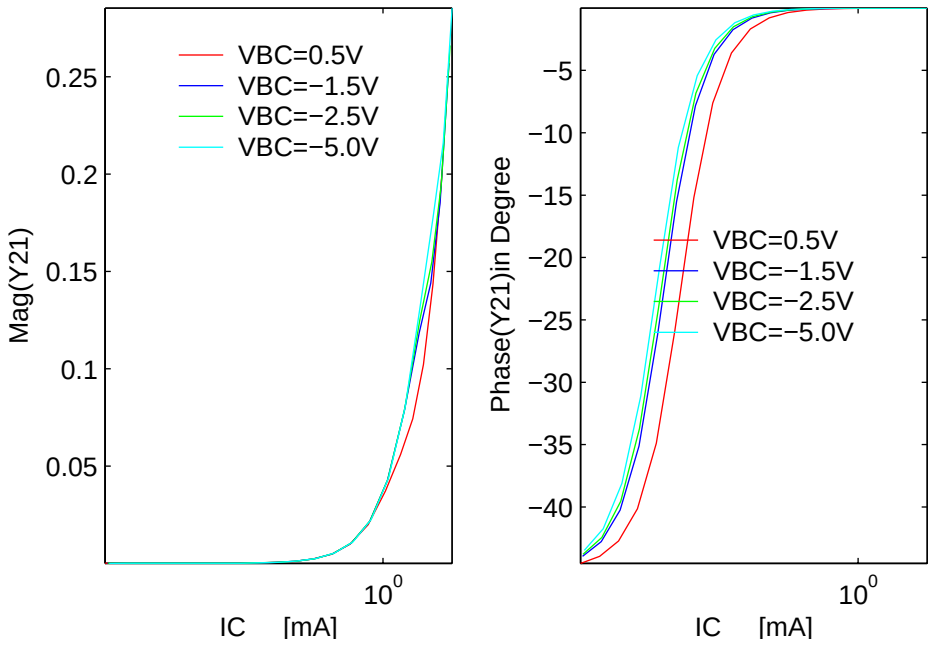

FIGURE 38. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

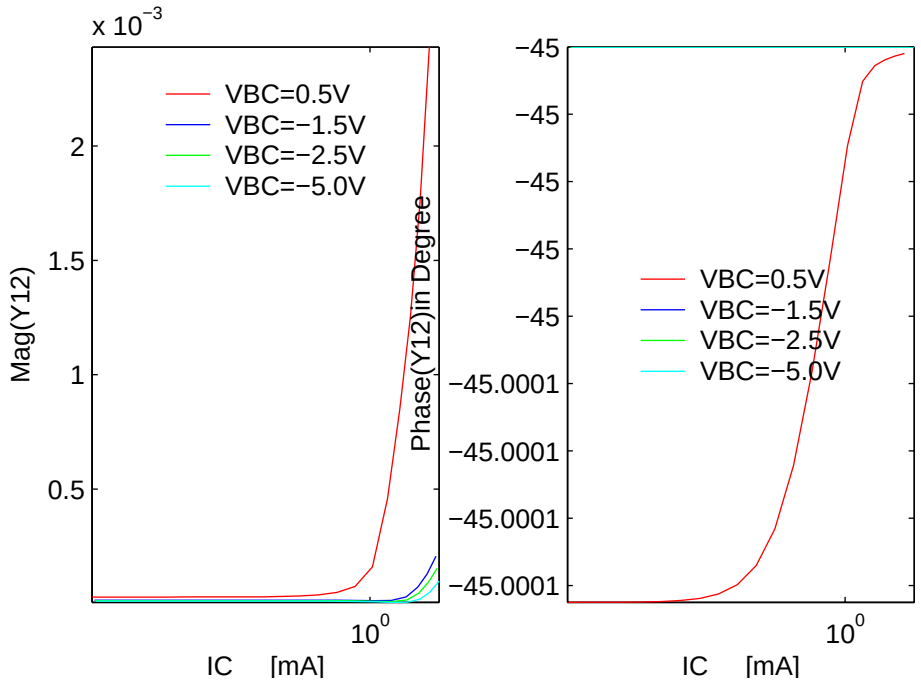

FIGURE 39. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

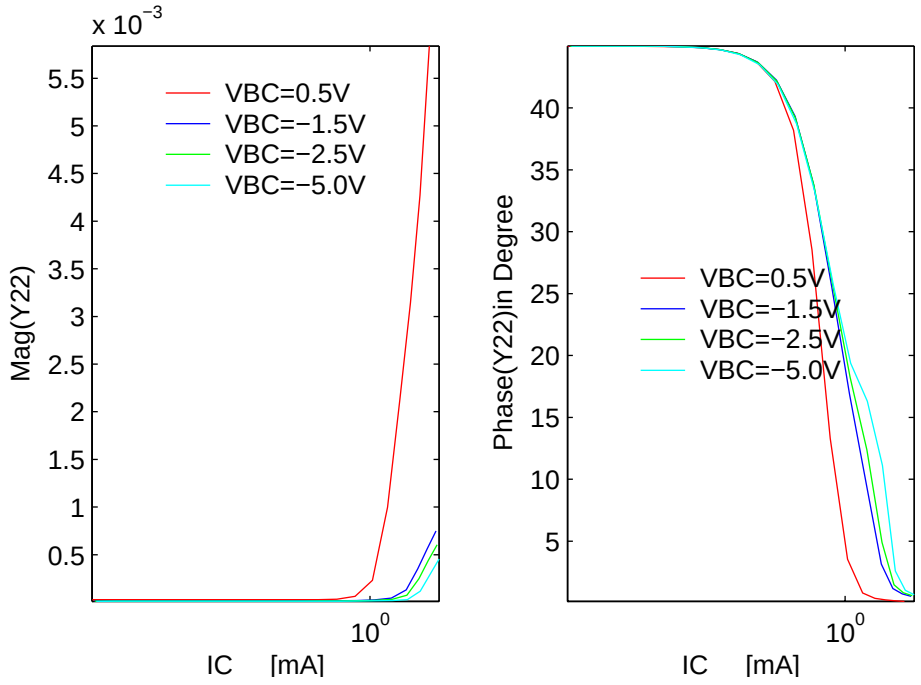

FIGURE 40. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

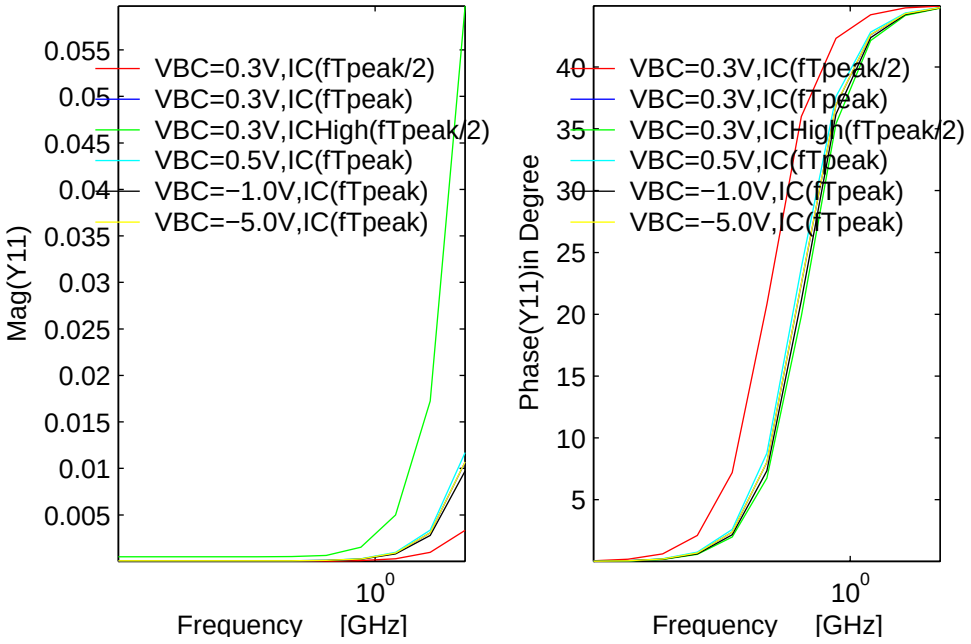

FIGURE 41. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

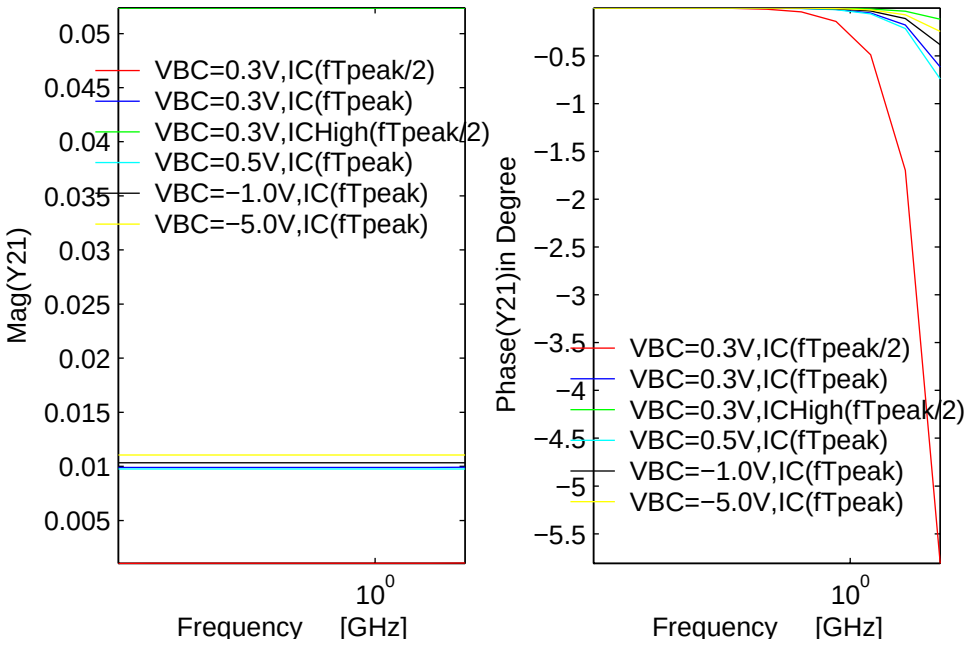

FIGURE 42. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

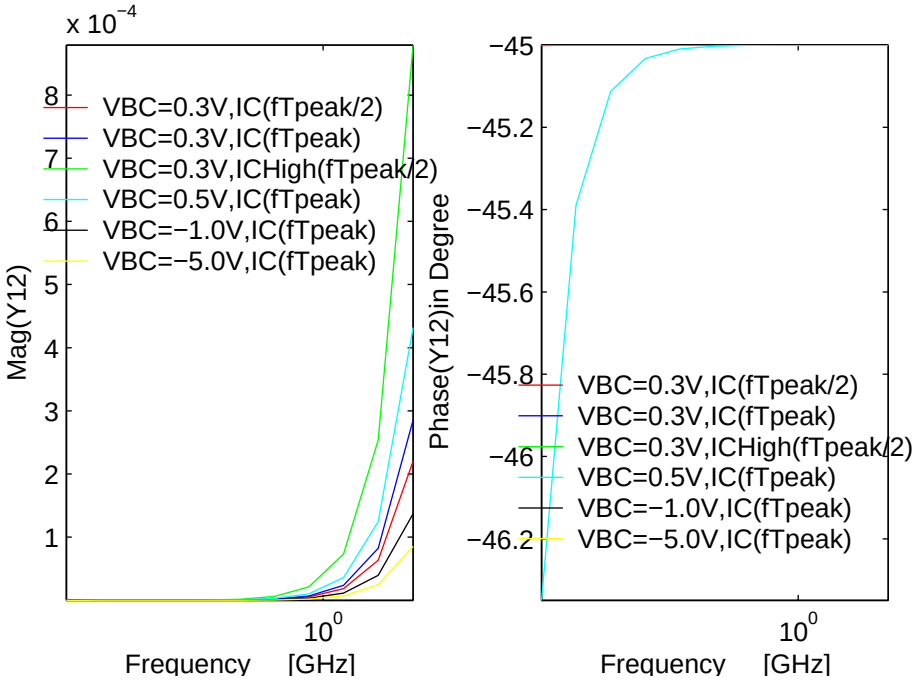

FIGURE 43. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

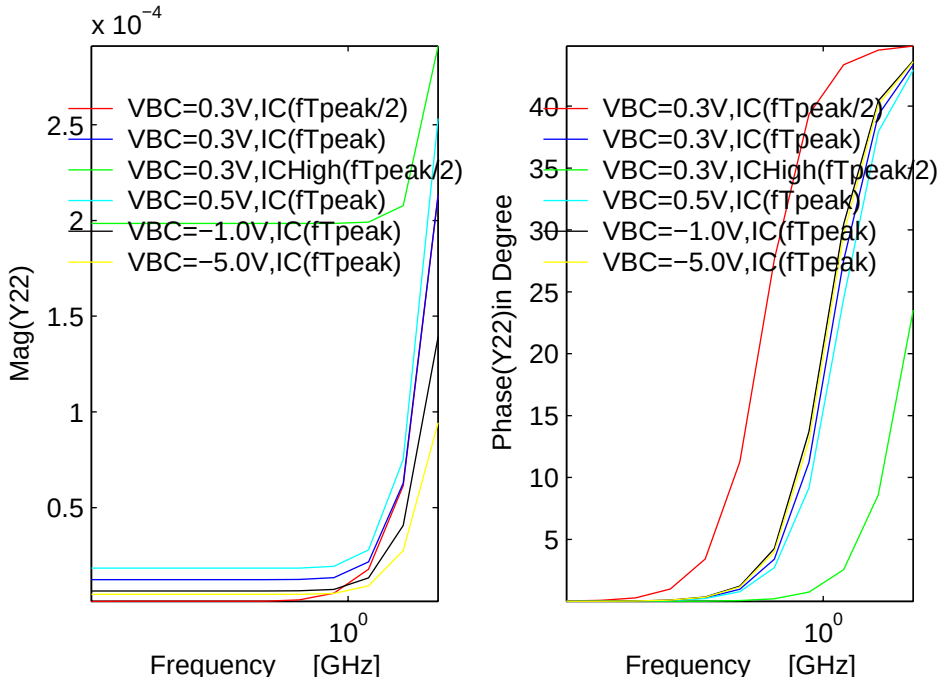

FIGURE 44. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

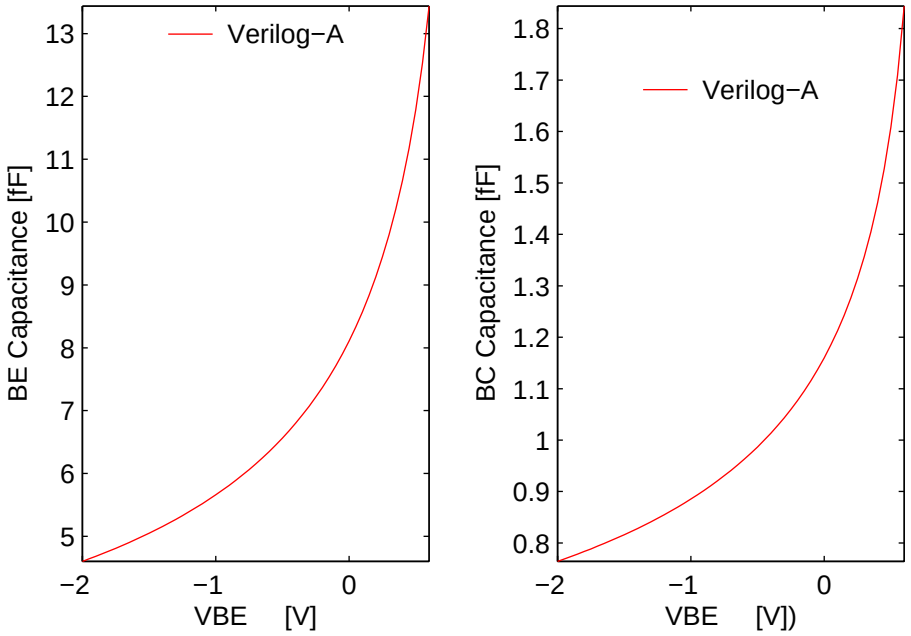

FIGURE 45. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with collector current spreading effect.

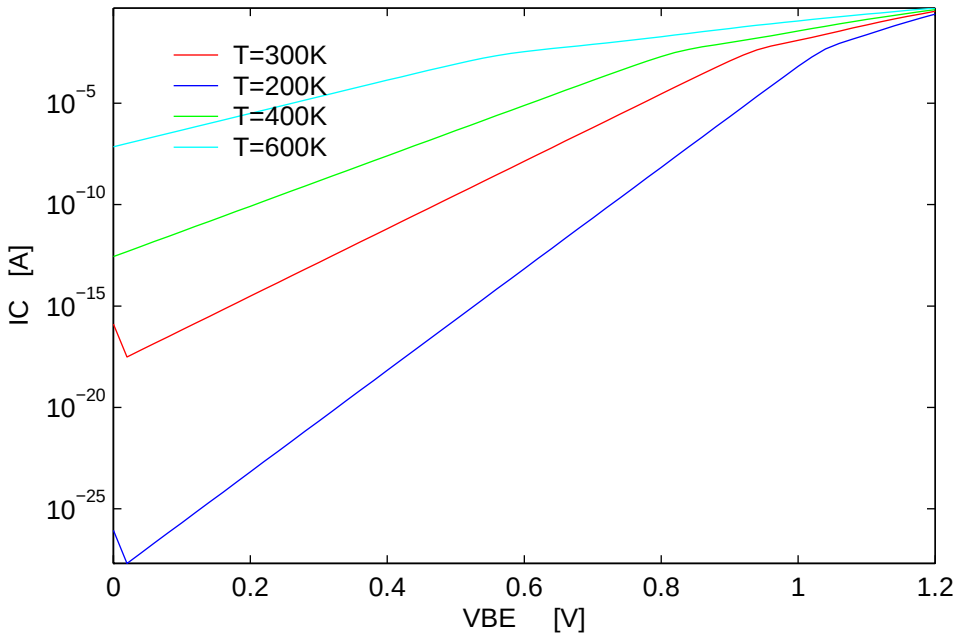

FIGURE 46. IC vs. VBE at VCE=2.5V and T=200K, 300K, 400K, 600K.

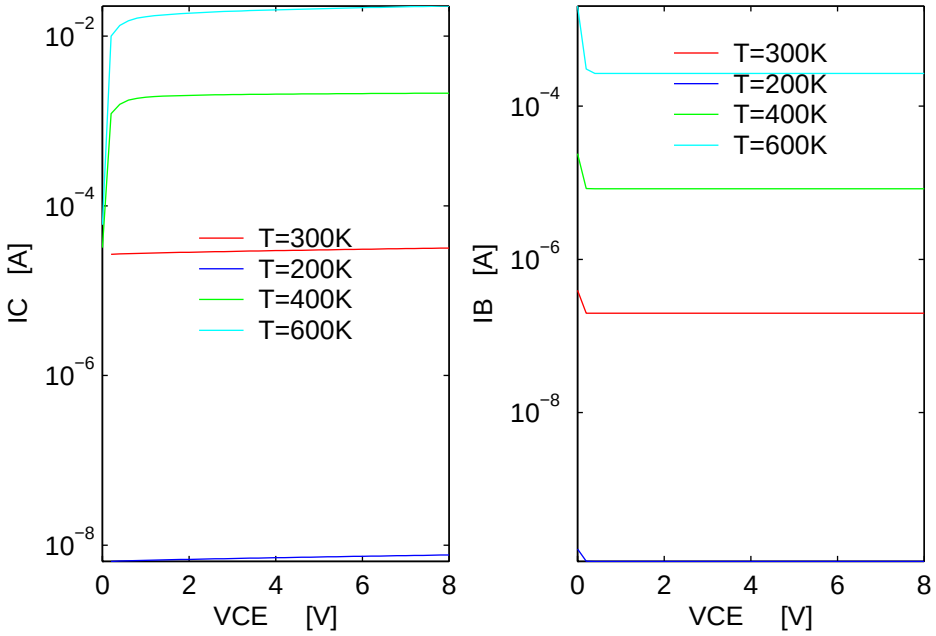

FIGURE 47. IC and IB vs. VCE at VB=0.8V and T=200K, 300K, 400K, 600K.

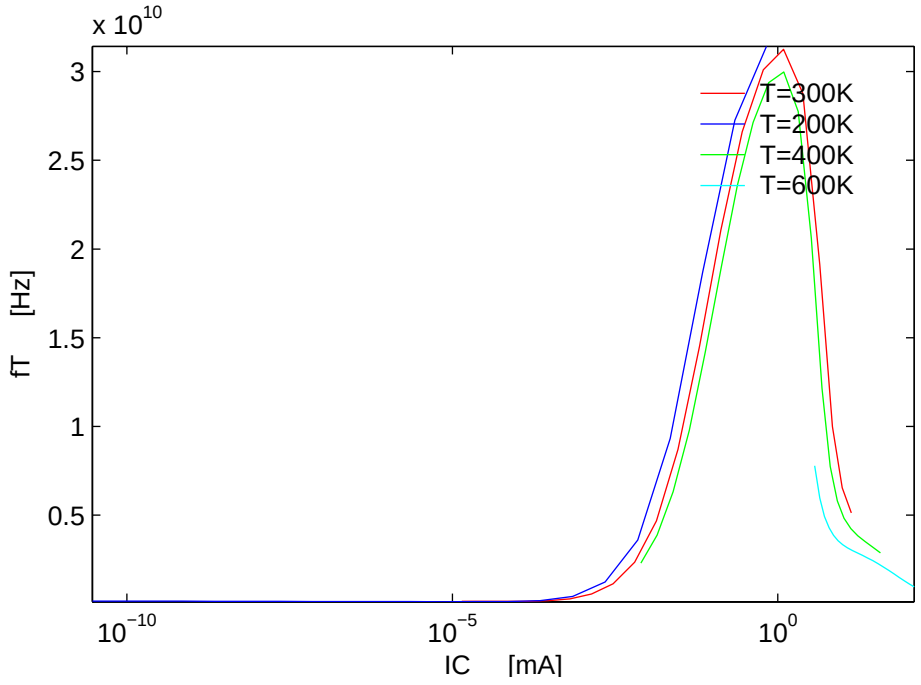

FIGURE 48. fT(Hz) vs. IC(mA) at VBC=-2.5V and T=200K, 300K, 400K, 600K.

Section 2: Results of Internal Transistor

With Tunneling current source tagged to the peripheral base node.

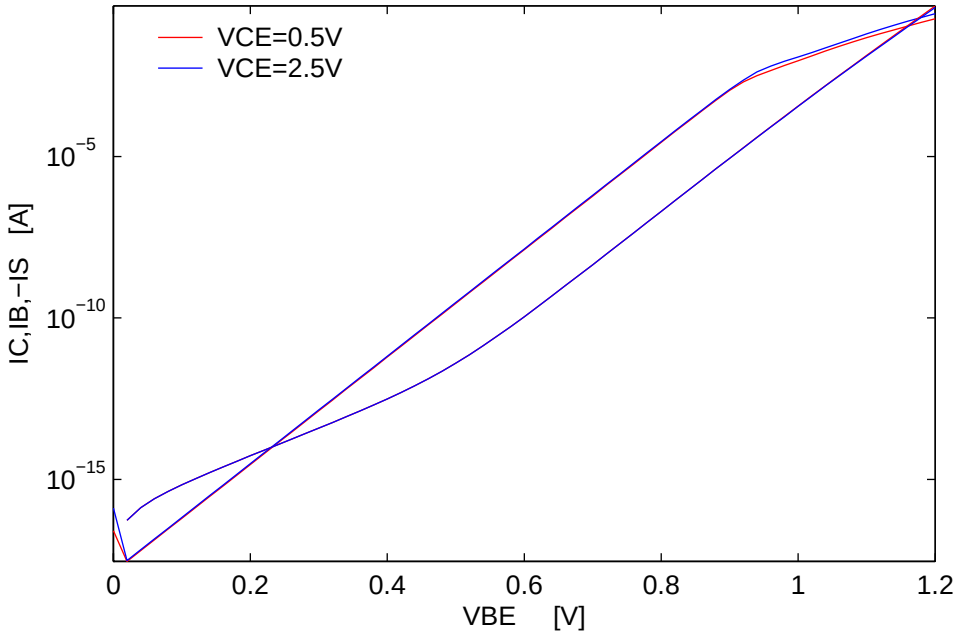

FIGURE 49. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K.

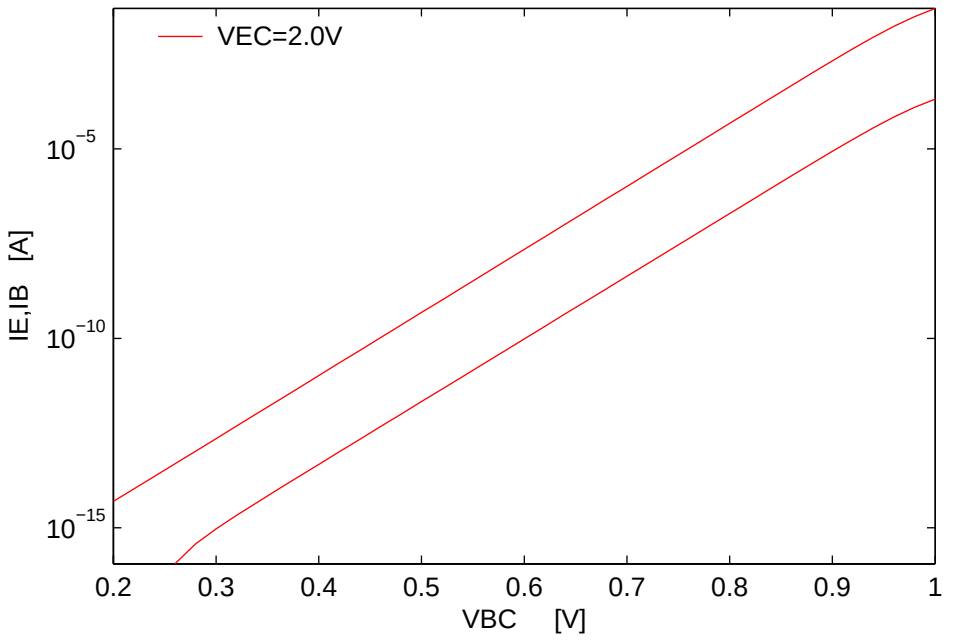

FIGURE 50. Reverse Gummel plots at VEC=2.0V at T=300K.

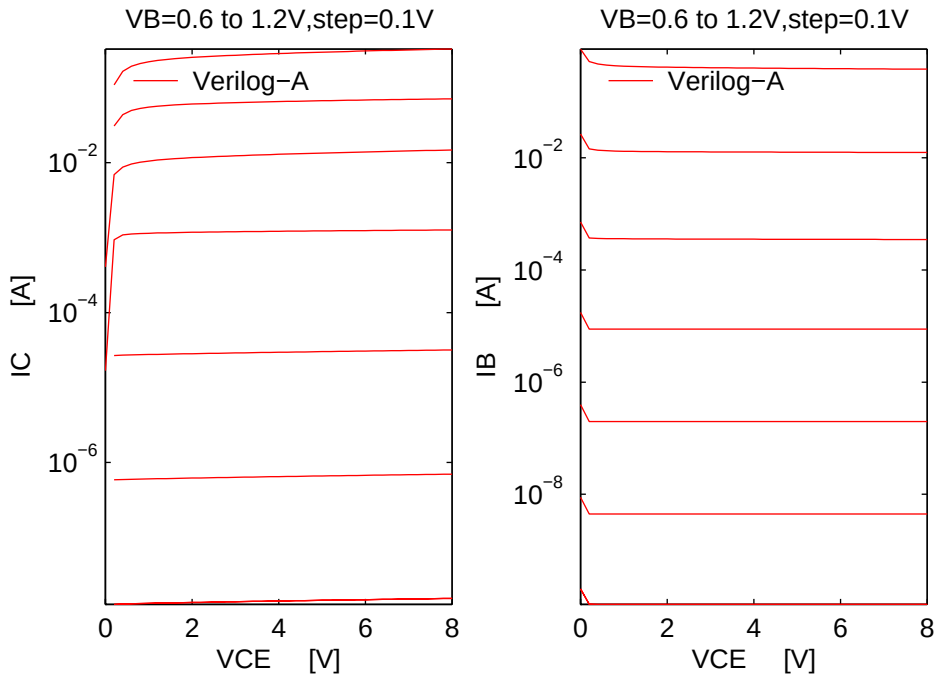

FIGURE 51. Forced-VB output characteristics and Ib-VCE plots at T=300K.

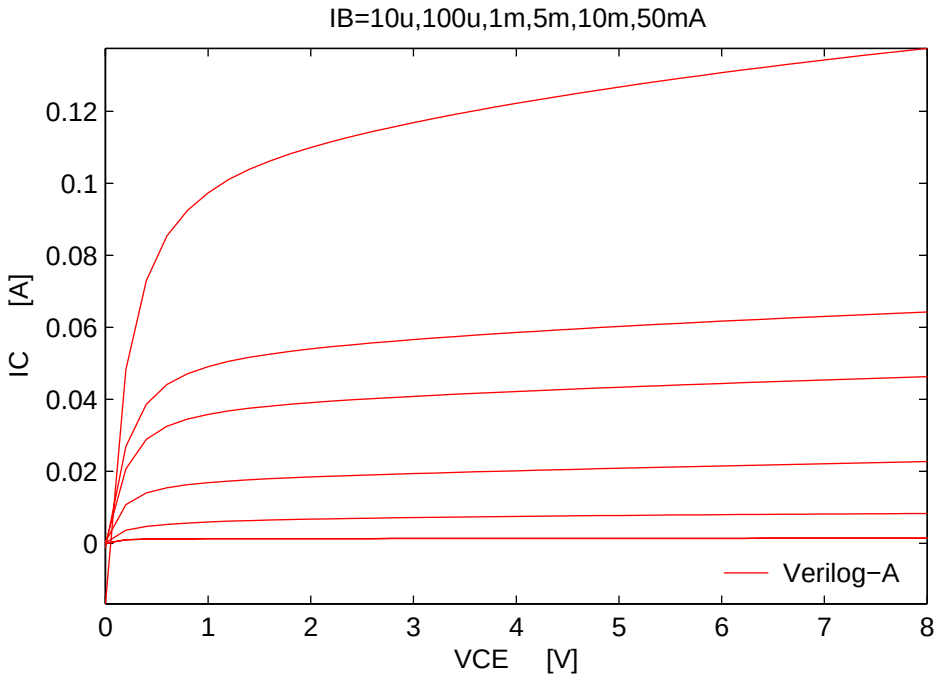

FIGURE 52. Forced-IB output characteristics at T=300K.

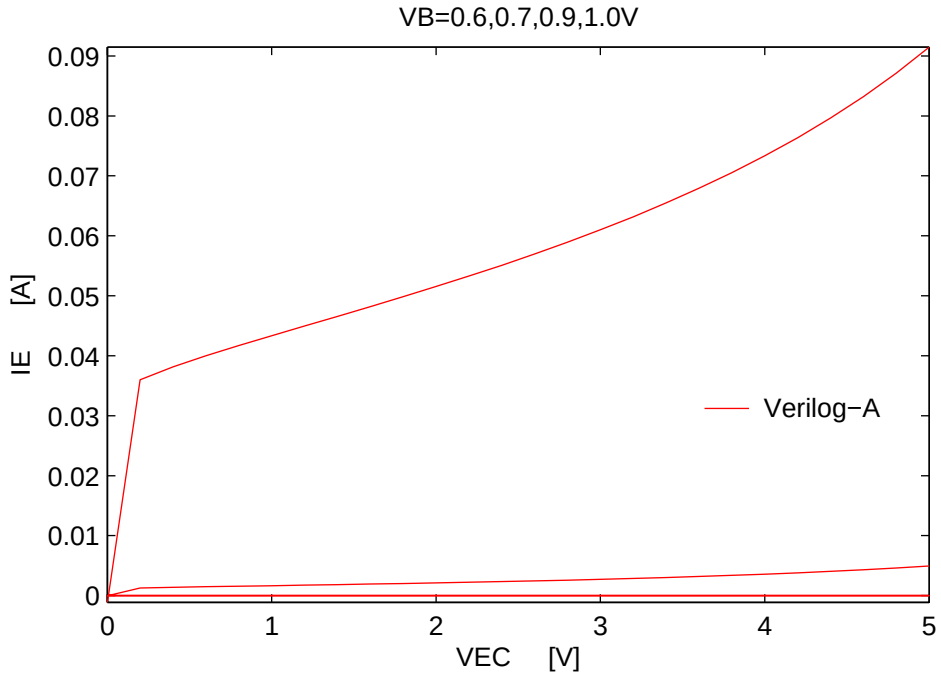

FIGURE 53. Reverse output characteristics at T=300K.

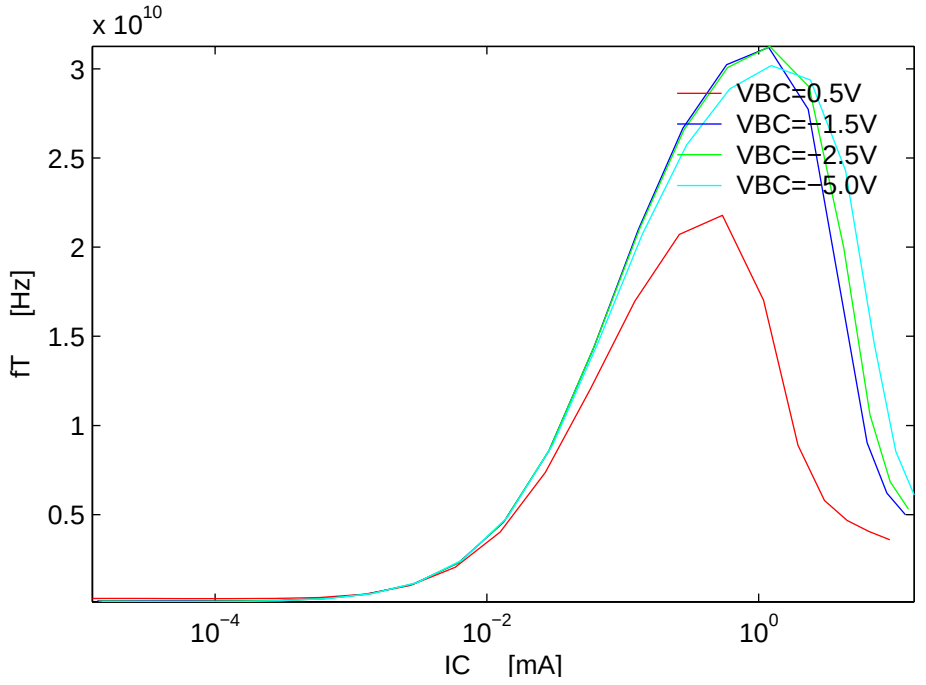

FIGURE 54. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz.

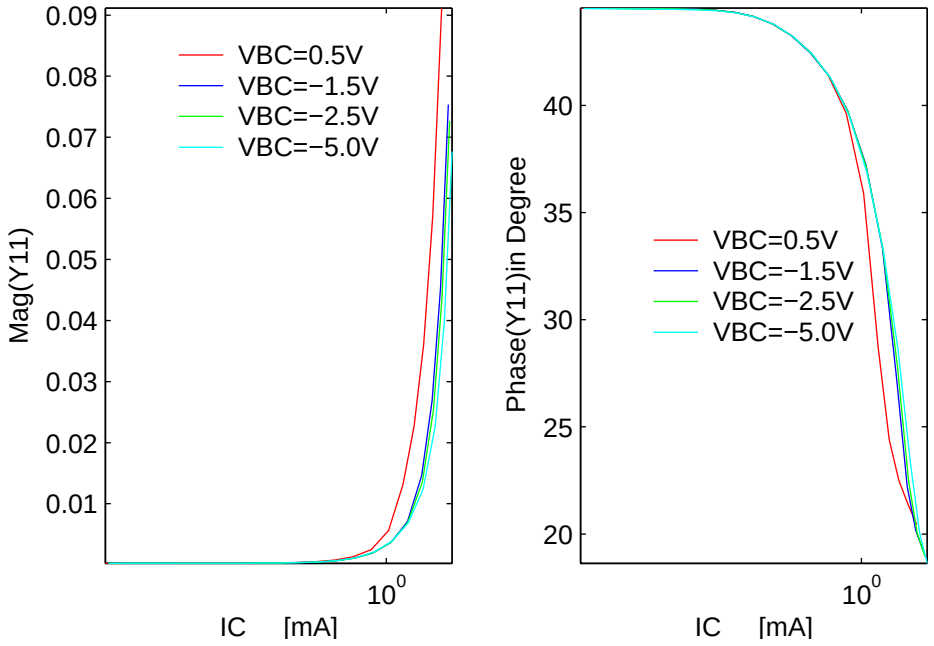

FIGURE 55. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

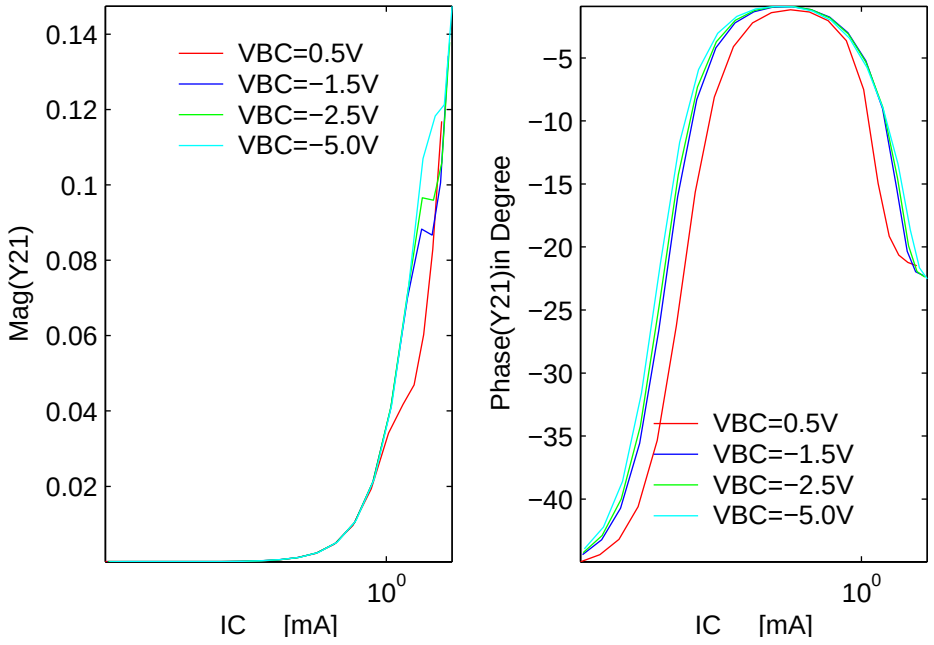

FIGURE 56. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

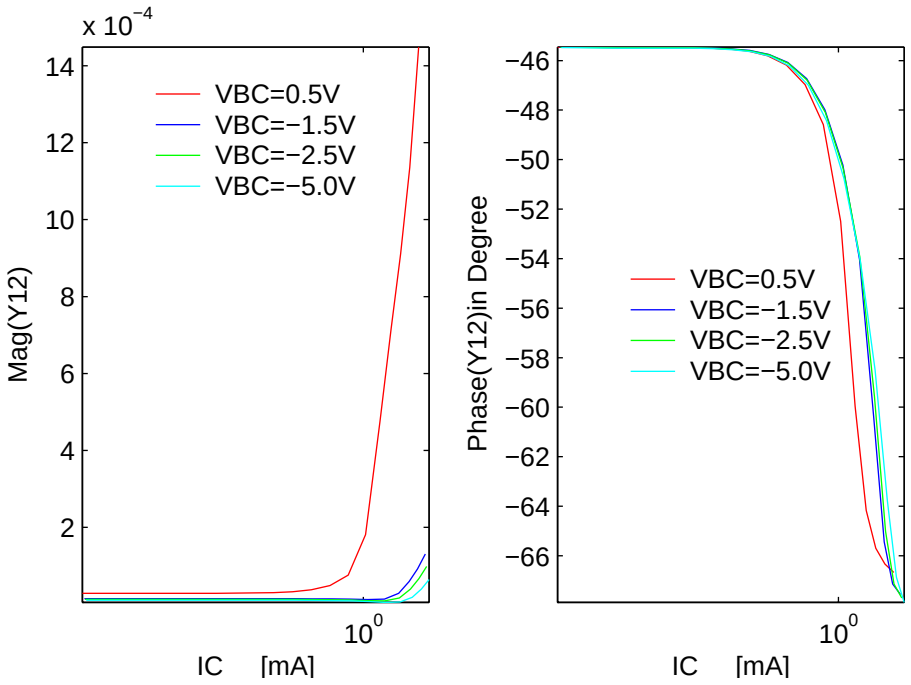

FIGURE 57. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

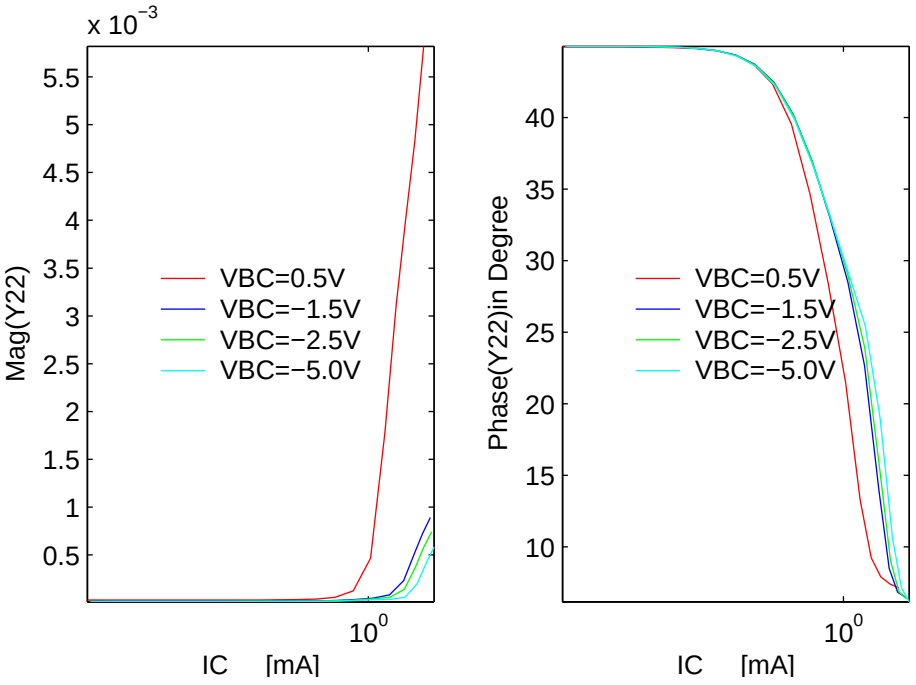

FIGURE 58. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

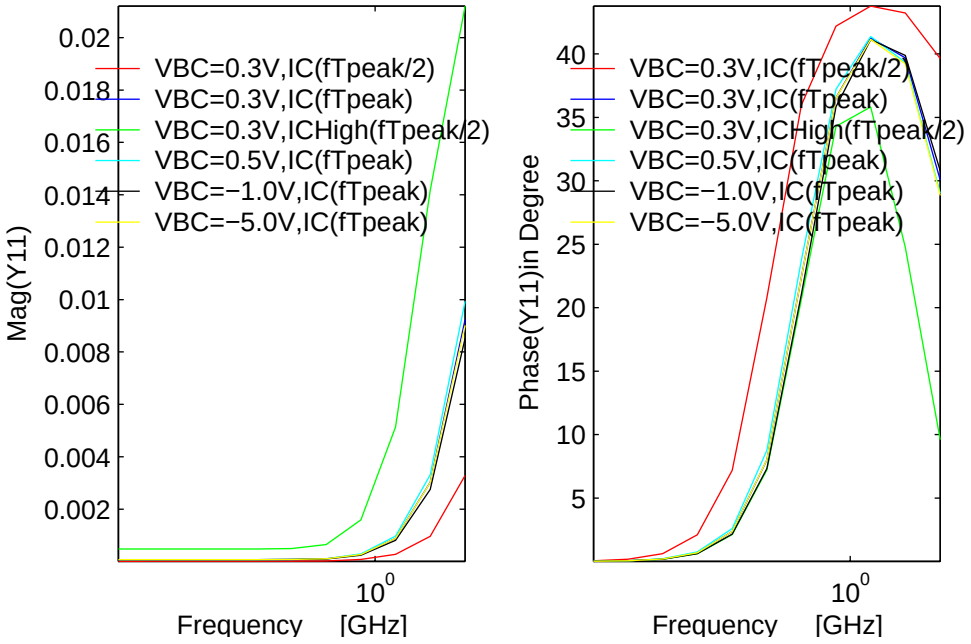

FIGURE 59. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

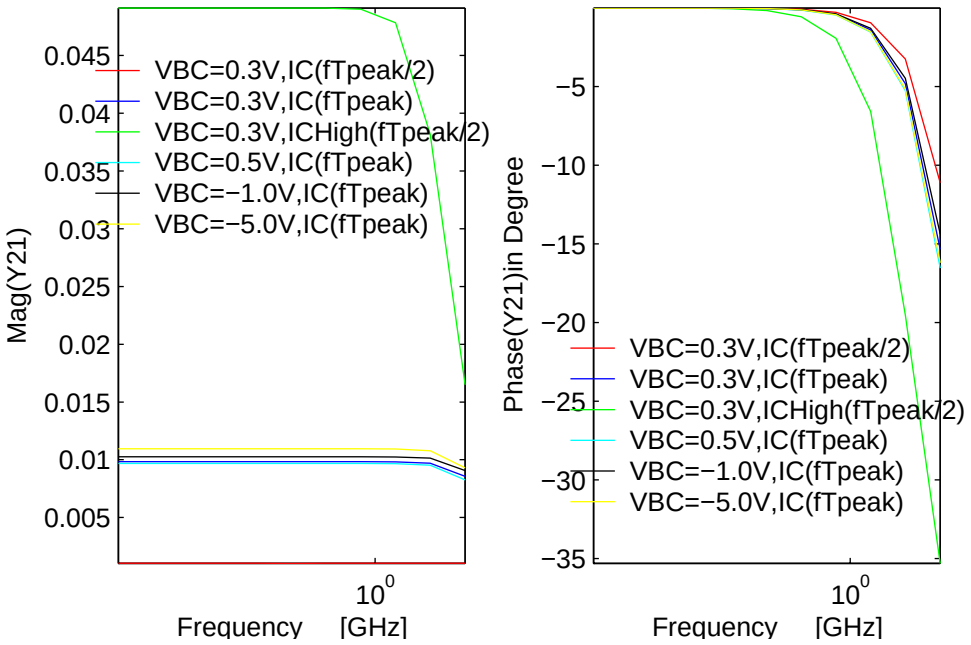

FIGURE 60. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

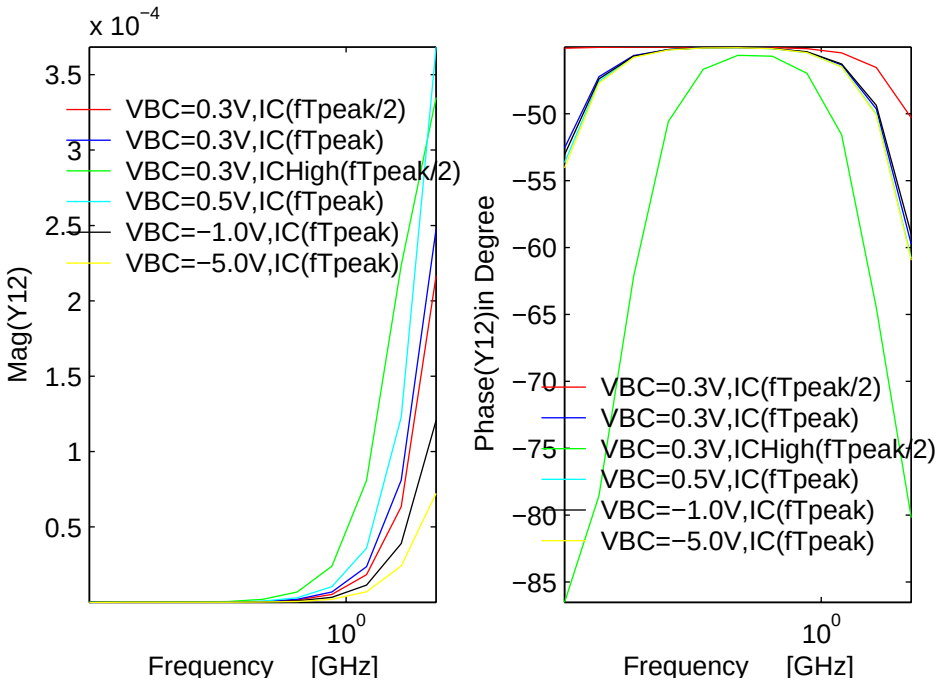

FIGURE 61. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

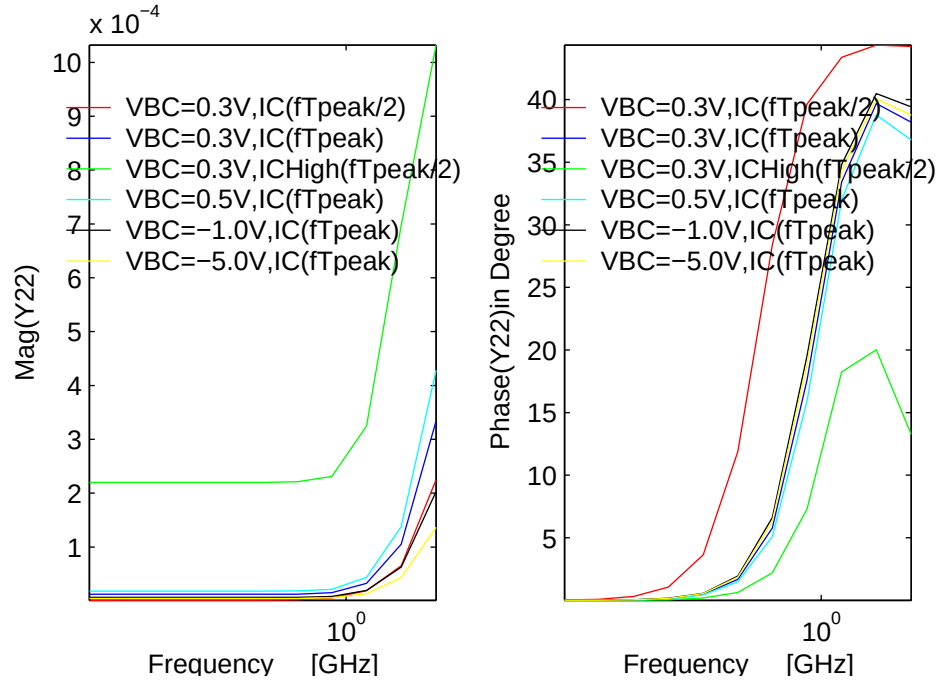

FIGURE 62. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

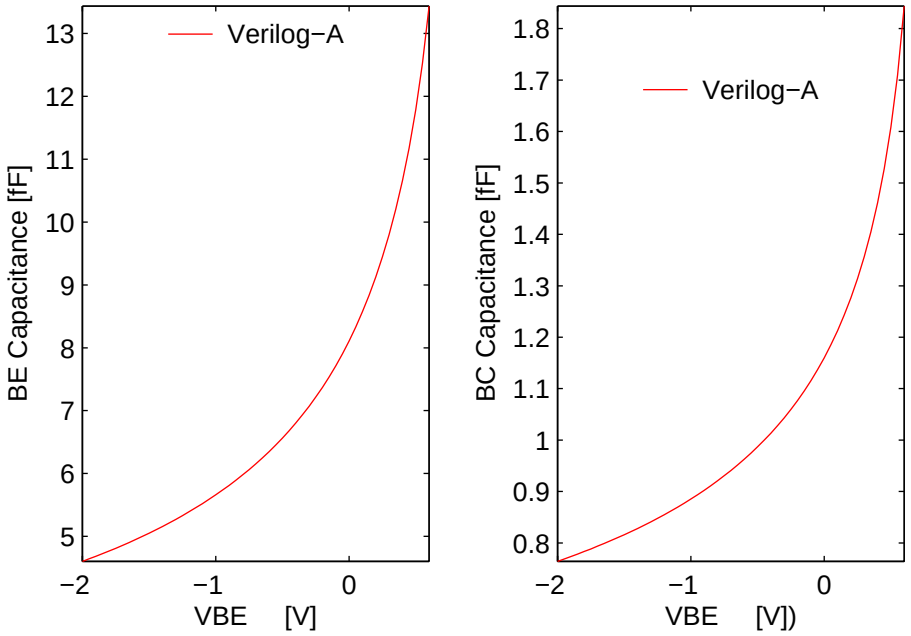

FIGURE 63. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K.

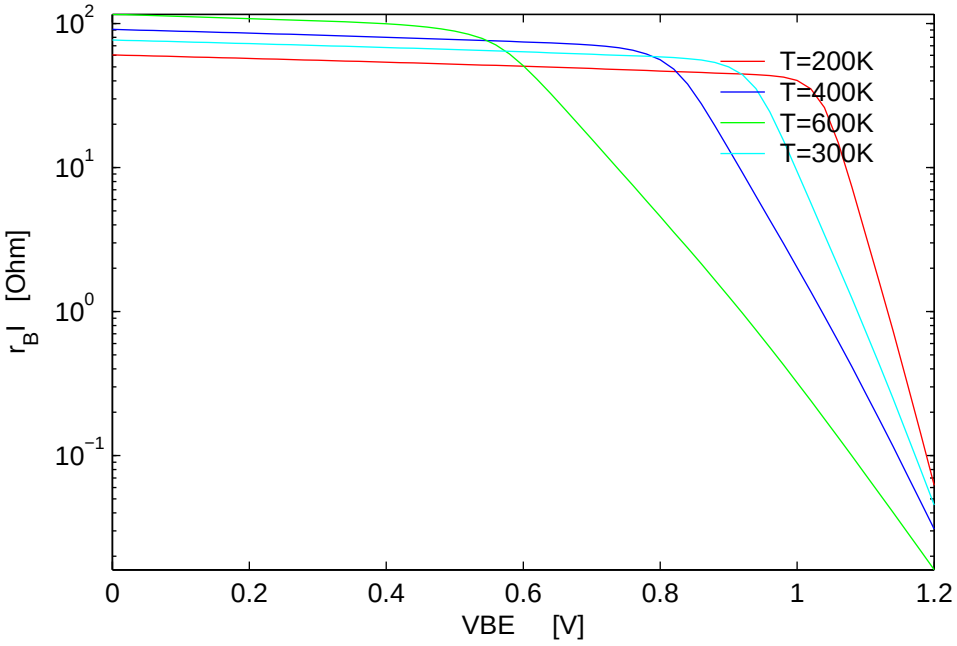

FIGURE 64. RBi vs. VBE for T=200K, 300K, 400K and 600K.

Section 2: Results of Complete Transistor

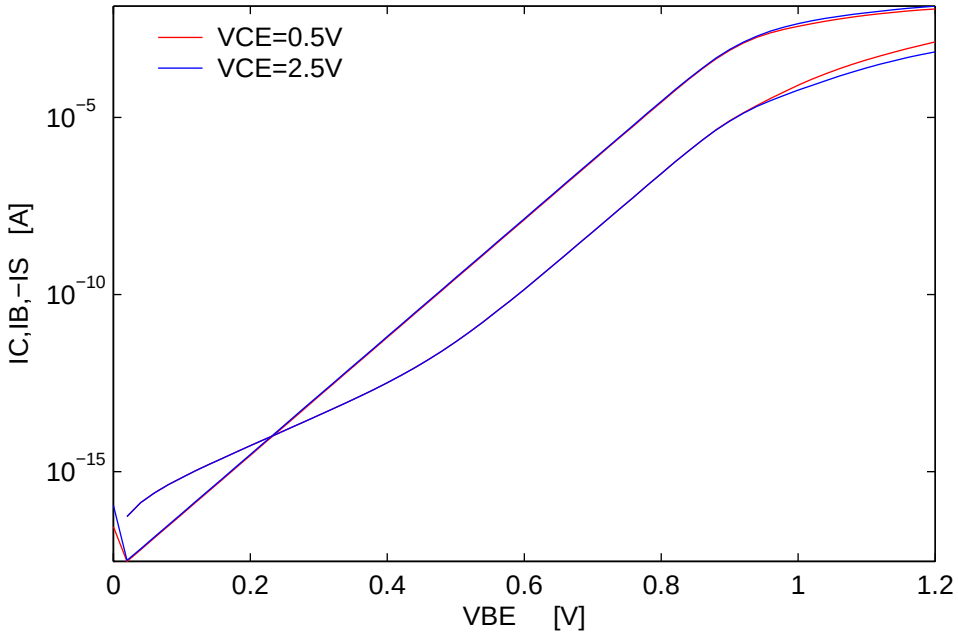

FIGURE 65. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K.

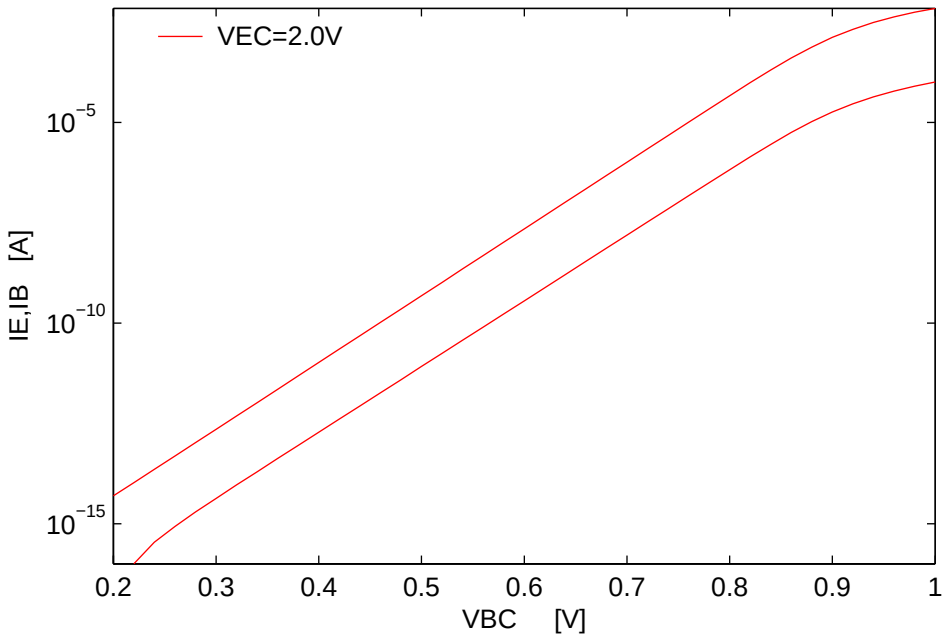

FIGURE 66. Reverse Gummel plots at VEC=2.0V at T=300K.

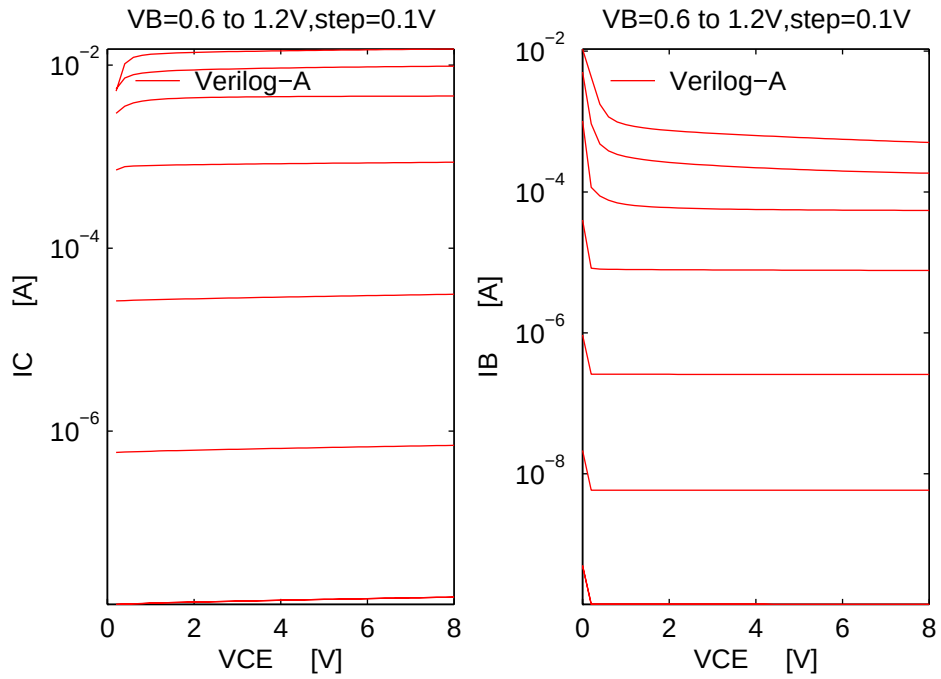

FIGURE 67. Forced-VB output characteristics and Ib-VCE plots at T=300K.

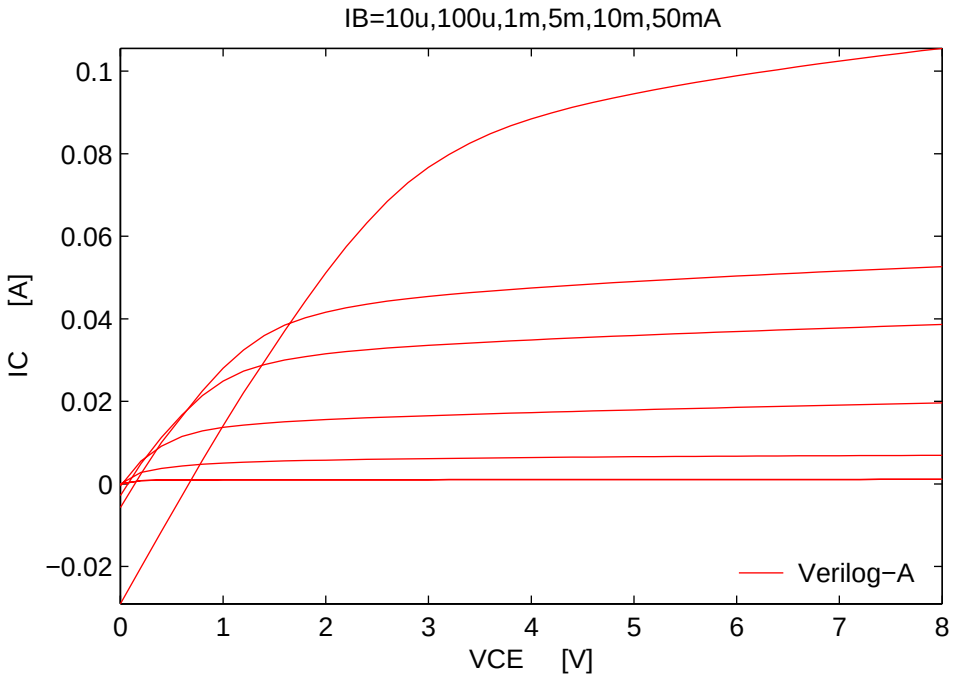

FIGURE 68. Forced-IB output characteristics at T=300K.

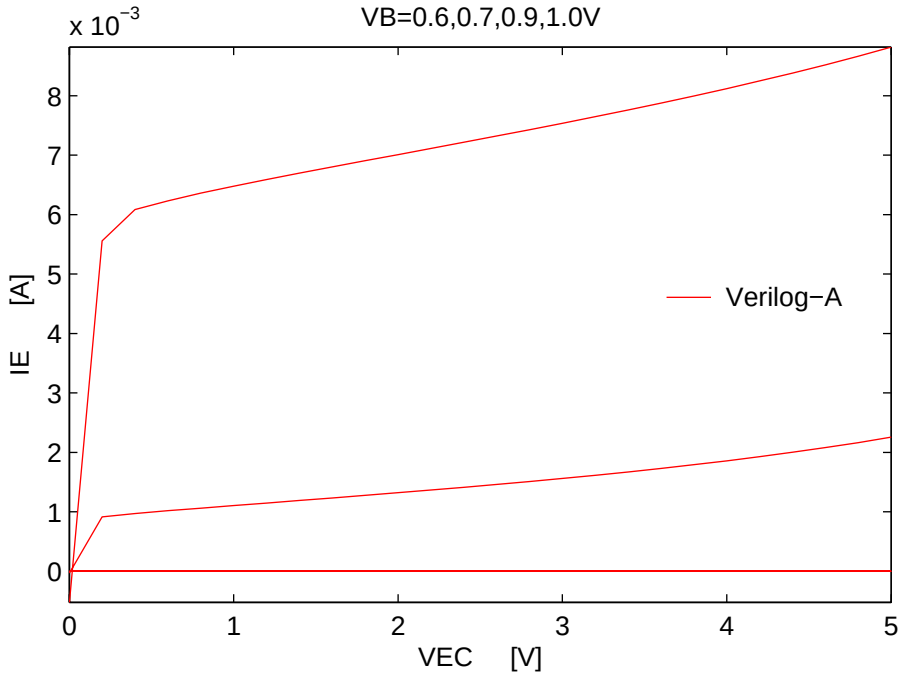

FIGURE 69. Reverse output characteristics at T=300K.

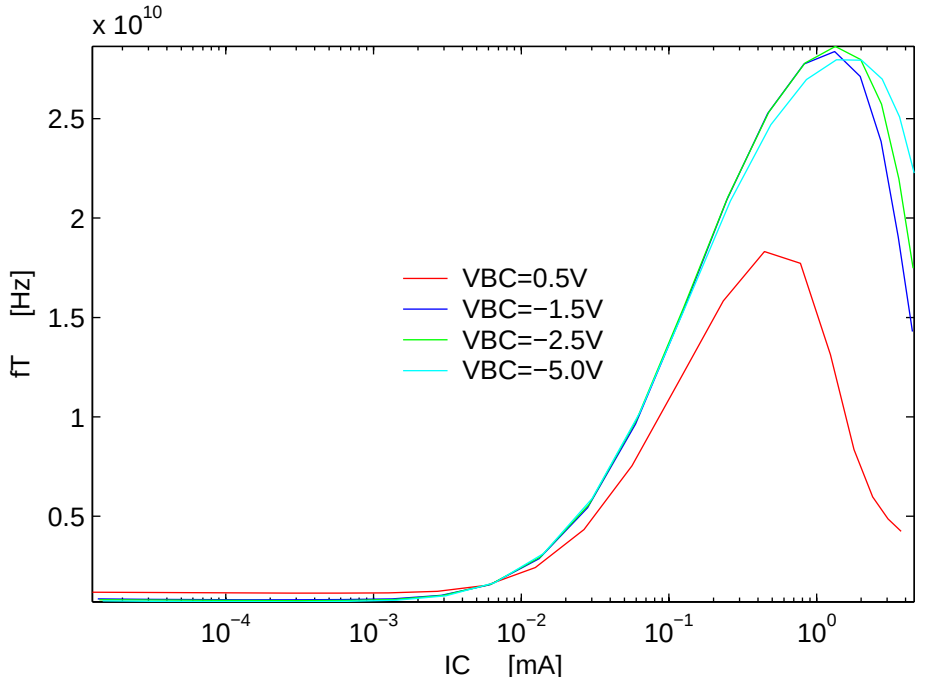

FIGURE 70. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz.

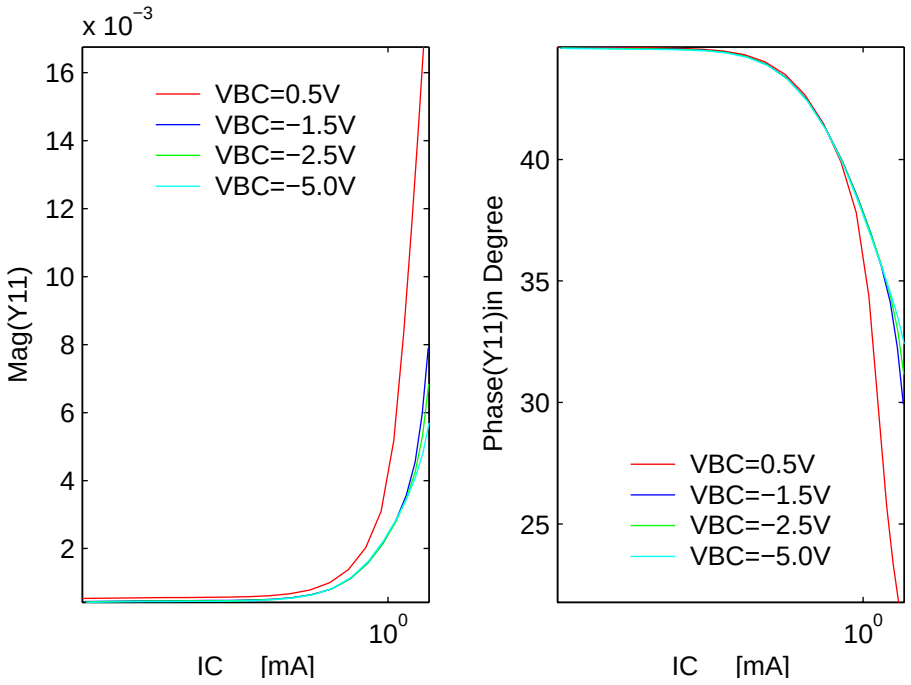

FIGURE 71. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

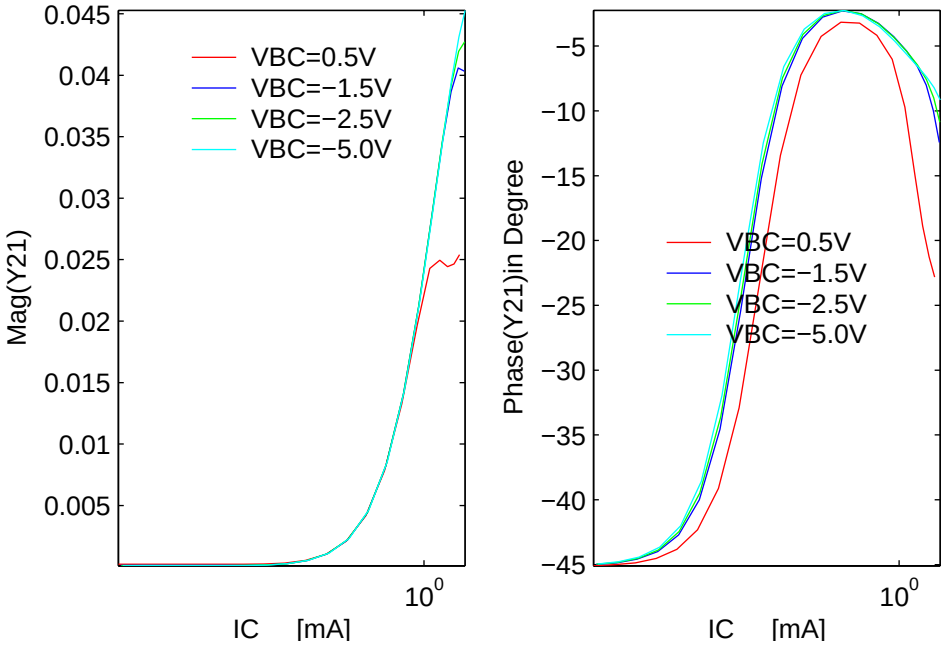

FIGURE 72. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

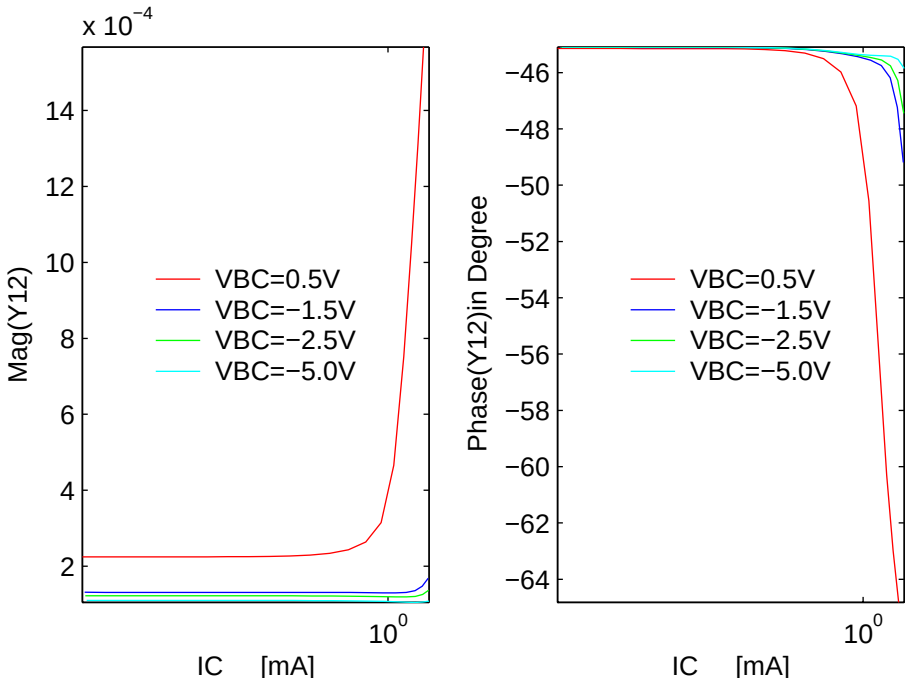

FIGURE 73. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

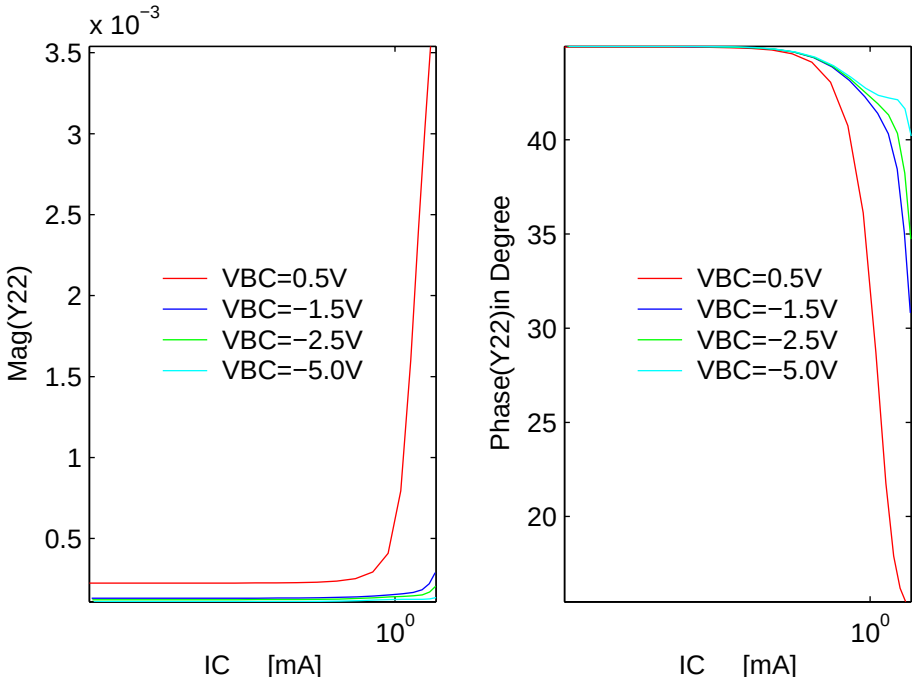

FIGURE 74. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V.

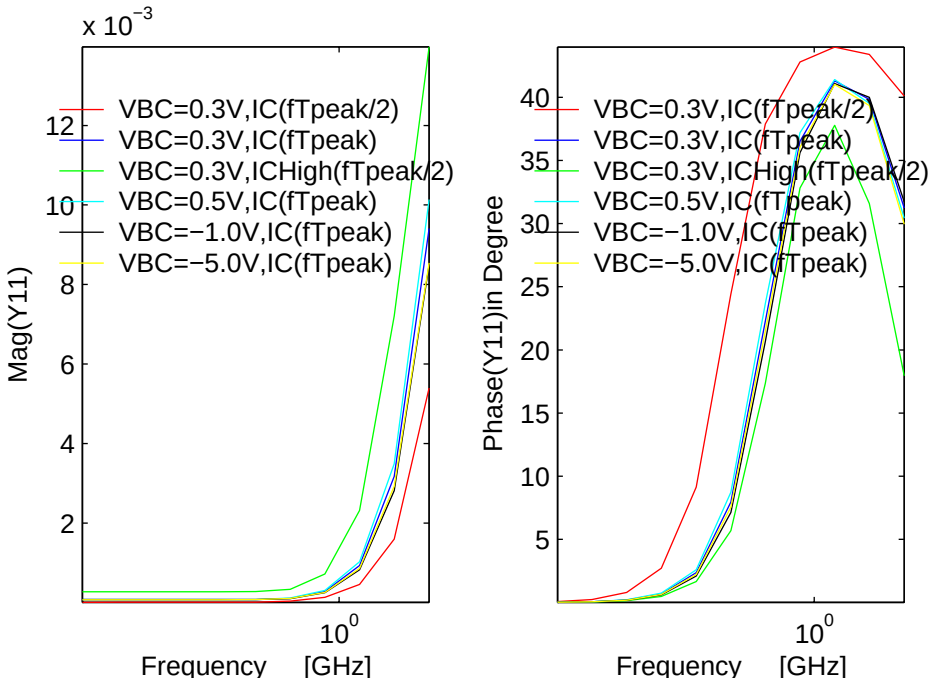

FIGURE 75. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

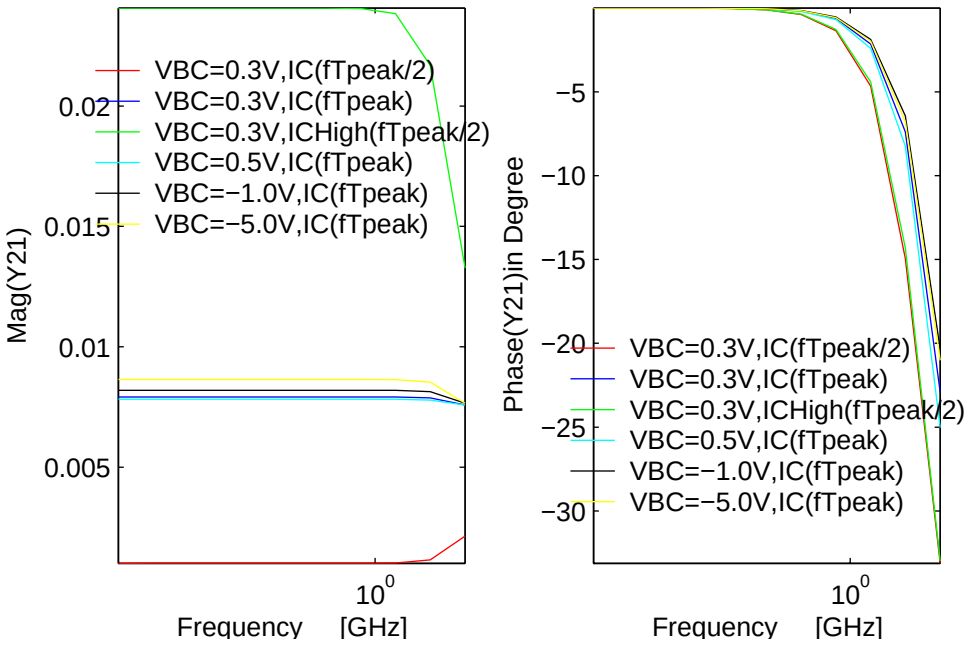

FIGURE 76. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

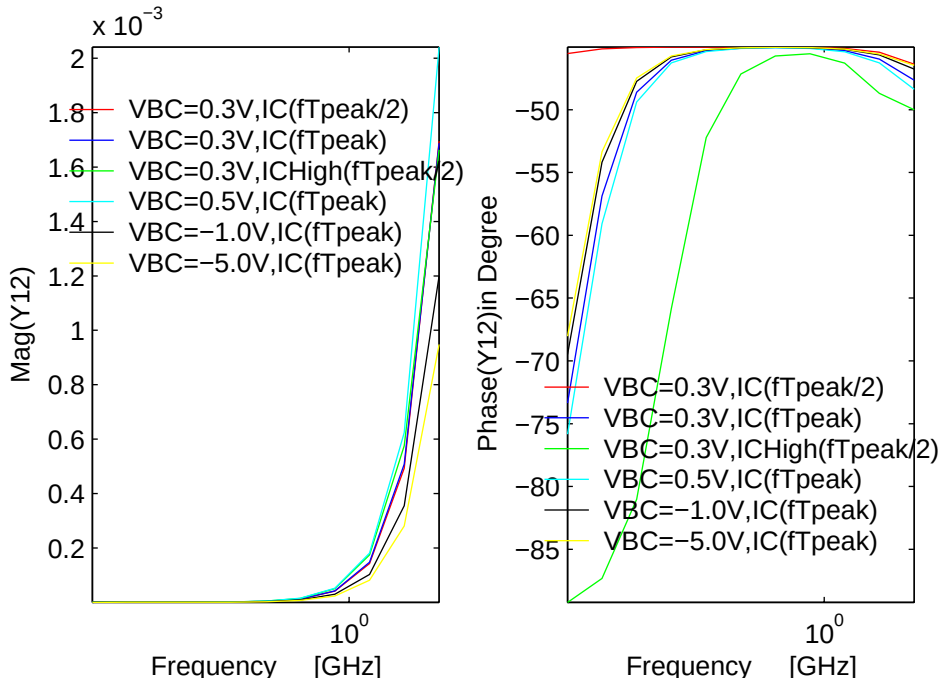

FIGURE 77. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

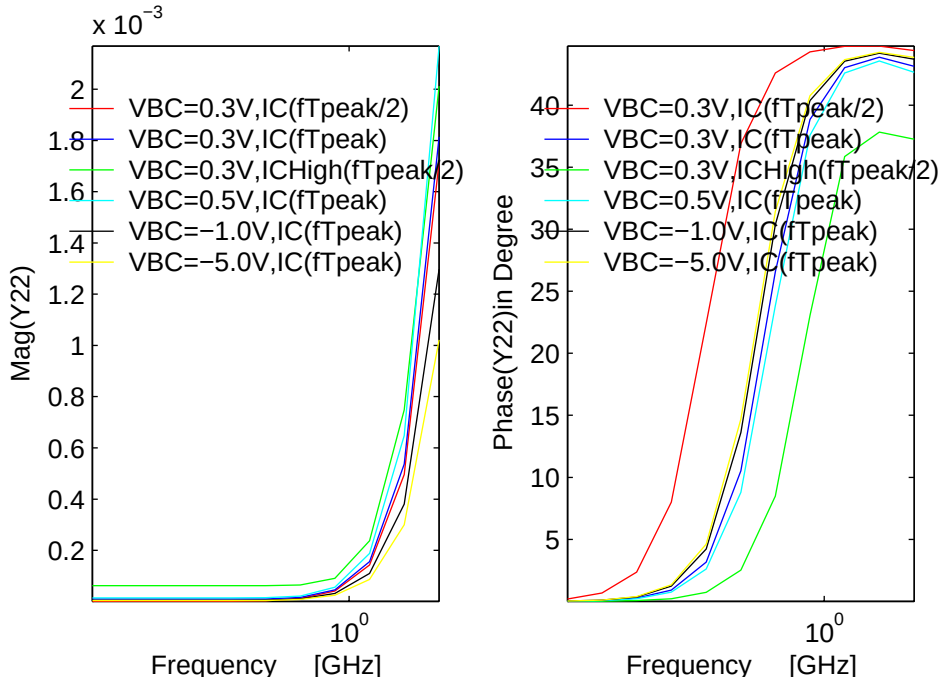

FIGURE 78. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2).

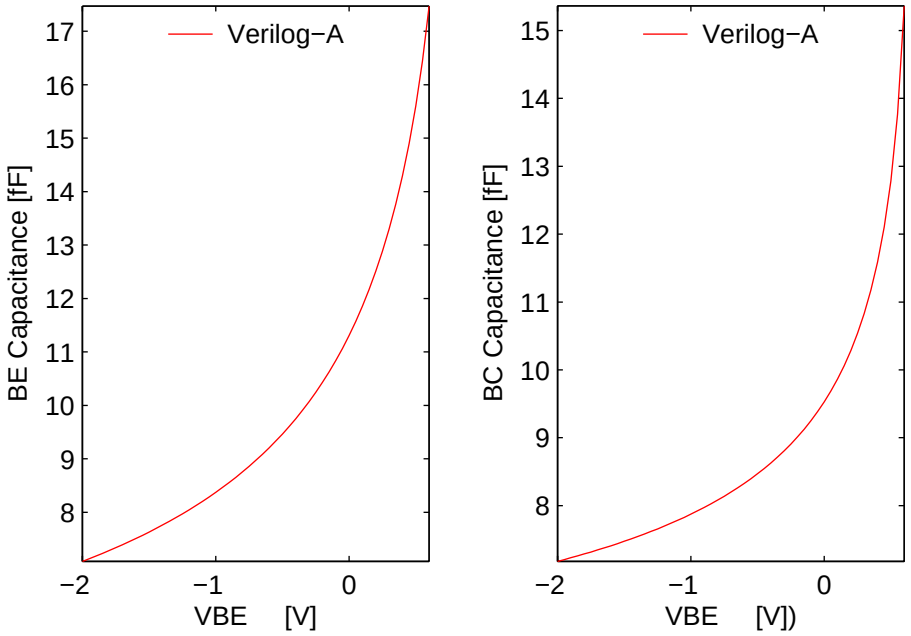

FIGURE 79. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K.

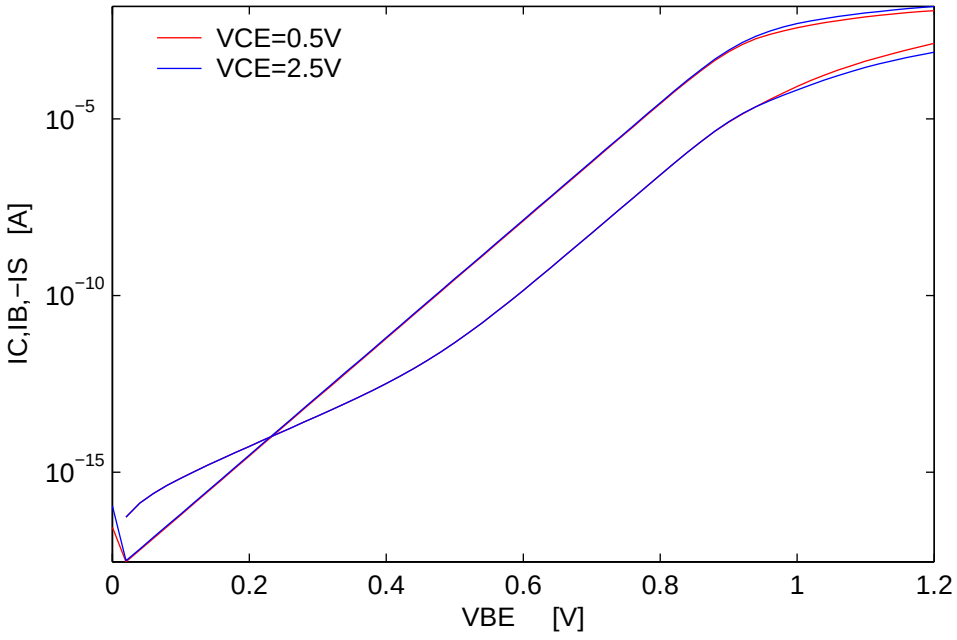

FIGURE 80. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with self-heating effect.

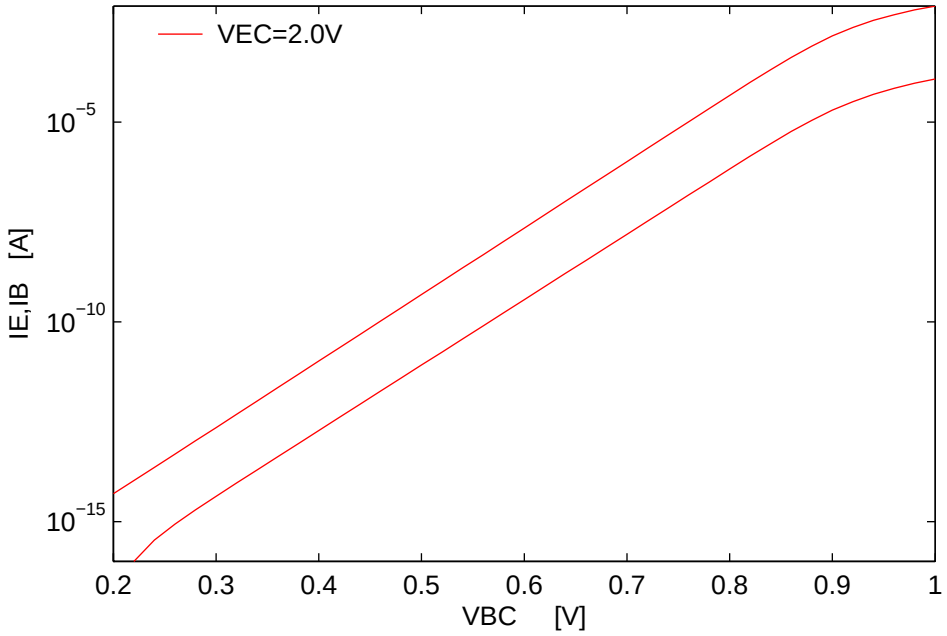

FIGURE 81. Reverse Gummel plots at VEC=2.0V at T=300K with self-heating effect.

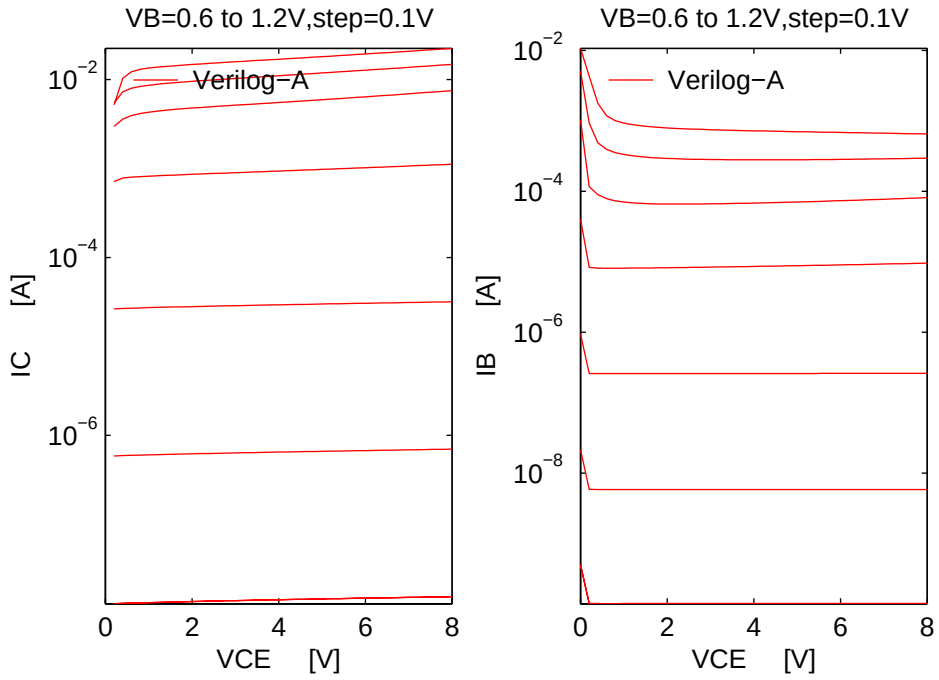

FIGURE 82. Forced-VB output characteristics and Ib-VCE plots at T=300K with self-heating effect.

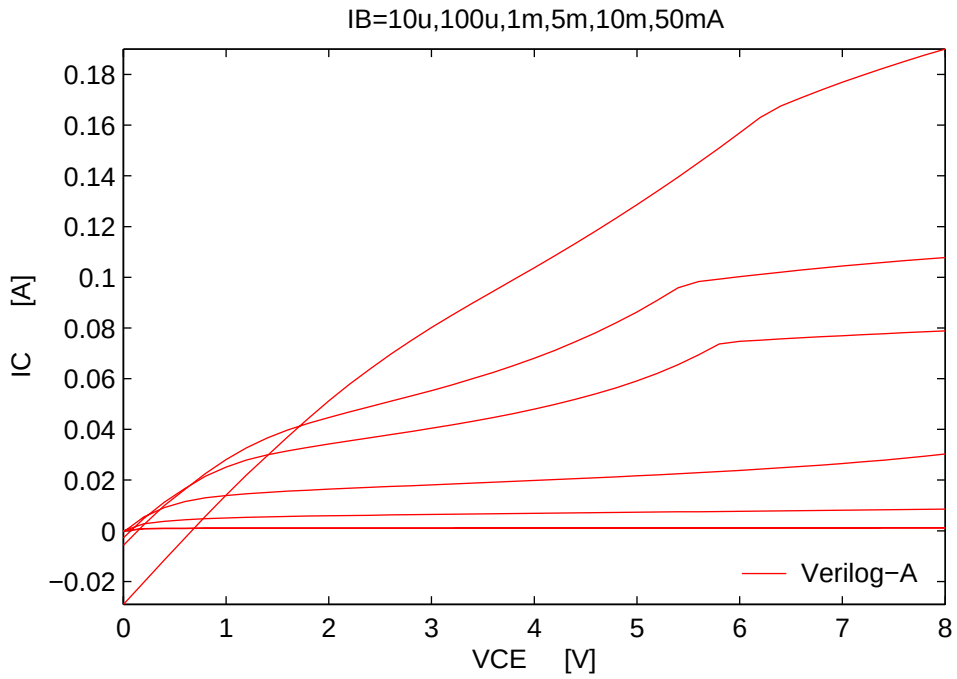

FIGURE 83. Forced-IB output characteristics at T=300K with self-heating effect.

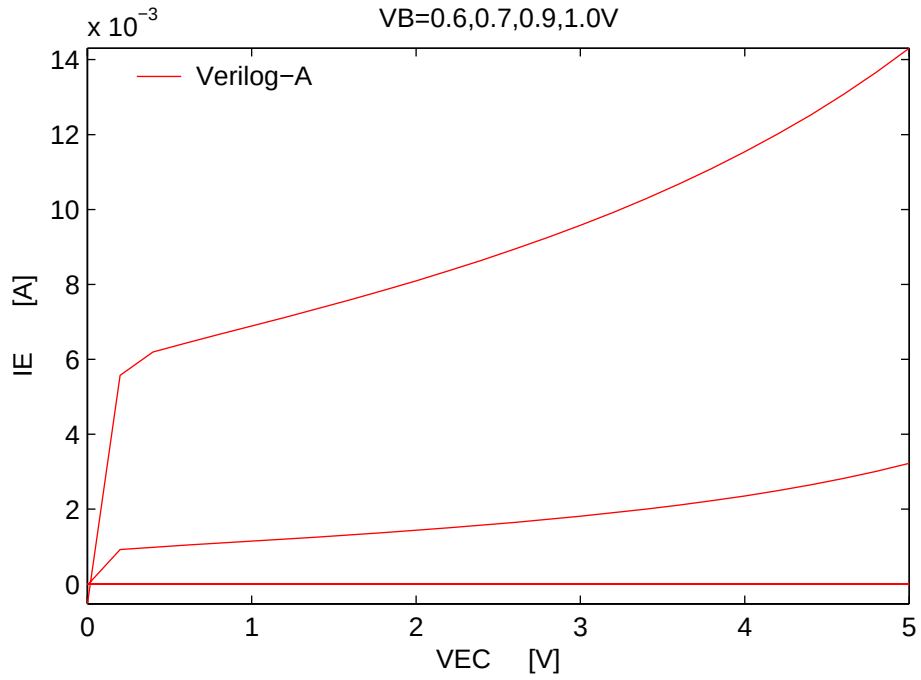

FIGURE 84. Reverse output characteristics at T=300K with self-heating effect.

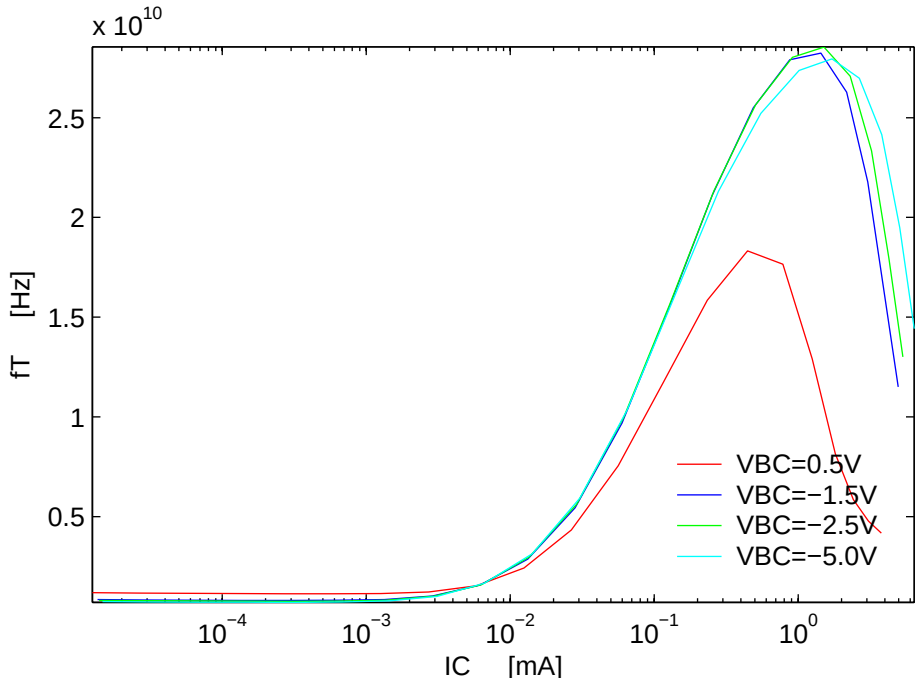

FIGURE 85. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with self-heating effect.

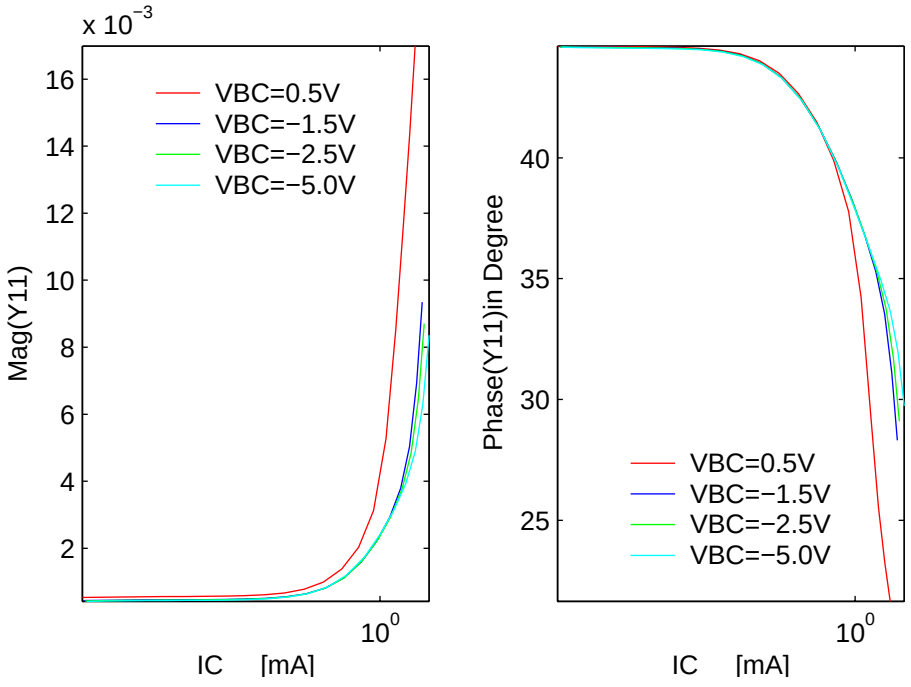

FIGURE 86. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

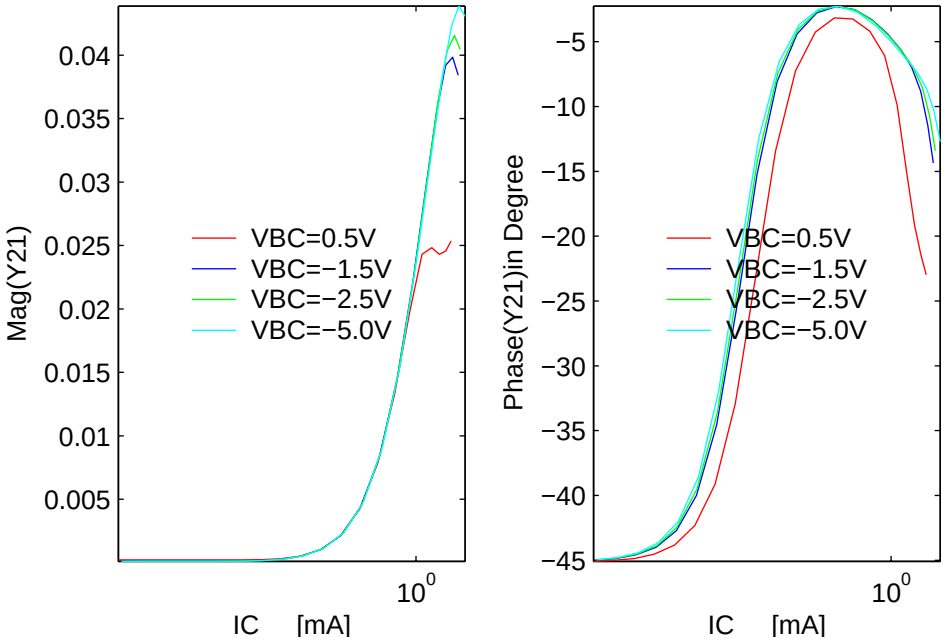

FIGURE 87. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

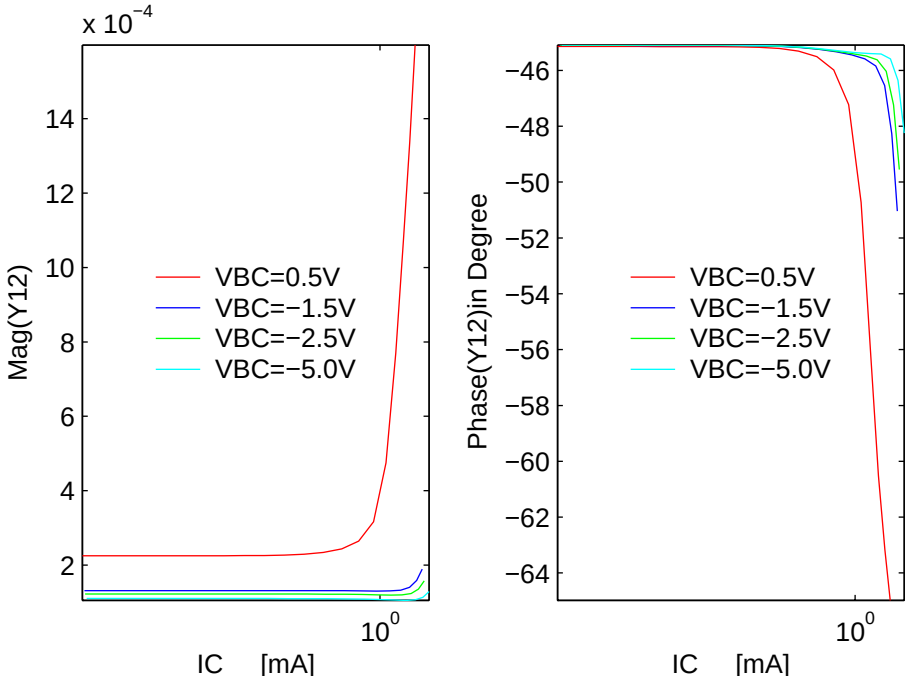

FIGURE 88. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

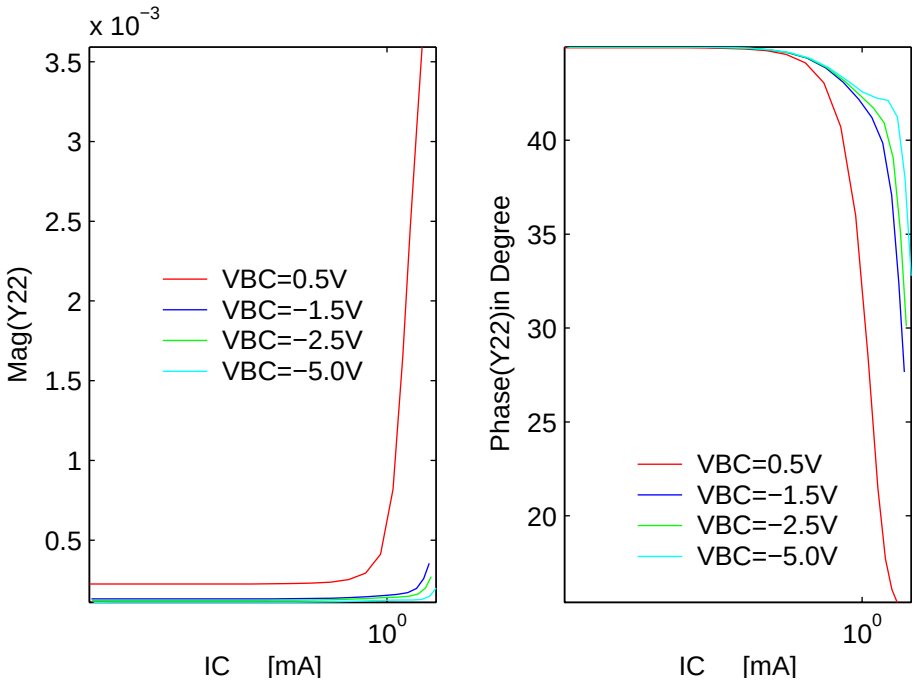

FIGURE 89. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with self-heating effect.

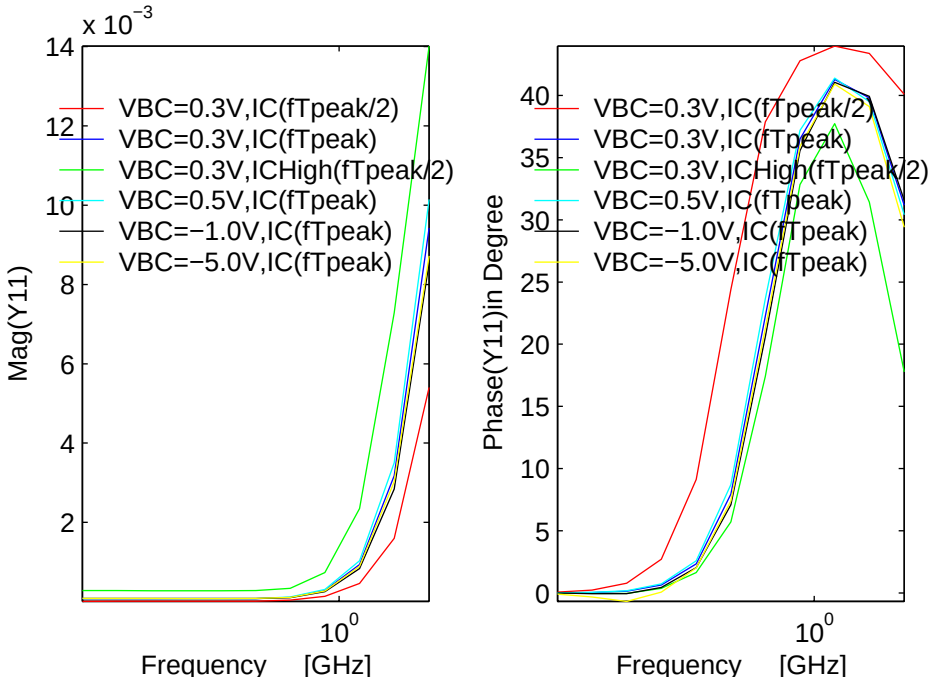

FIGURE 90. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

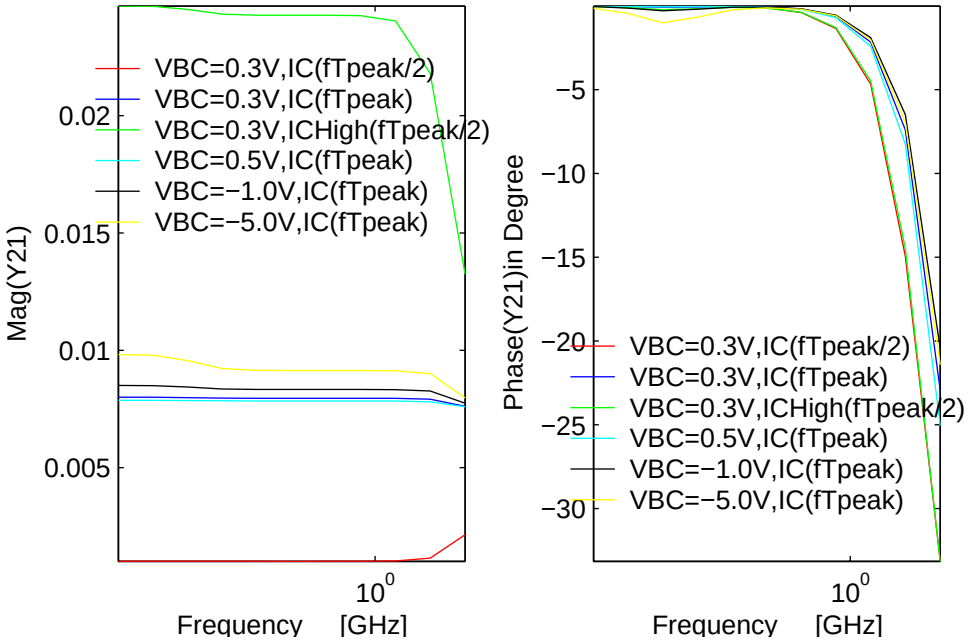

FIGURE 91. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

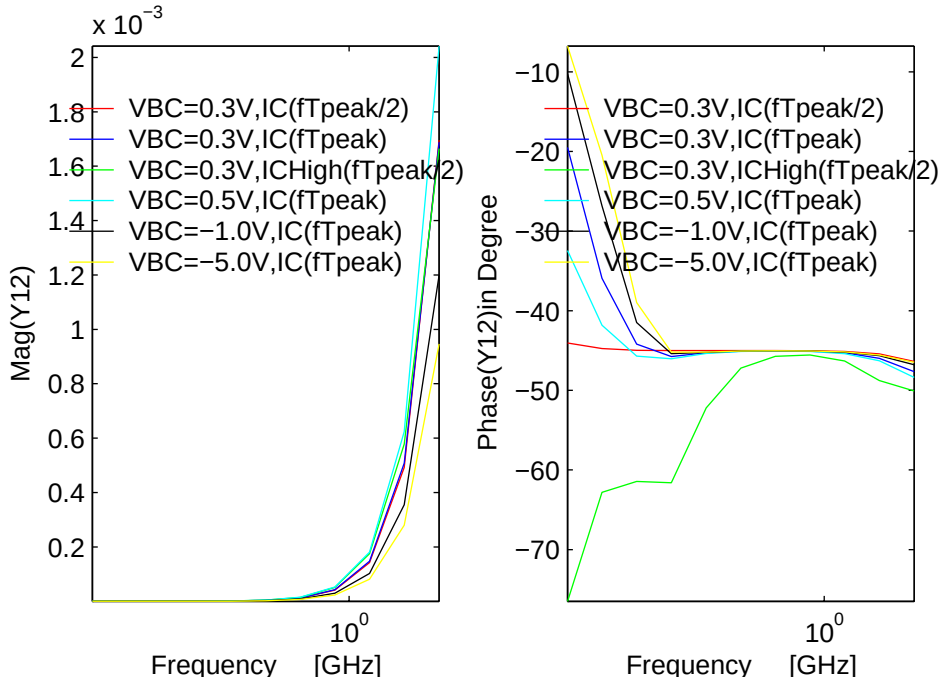

FIGURE 92. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

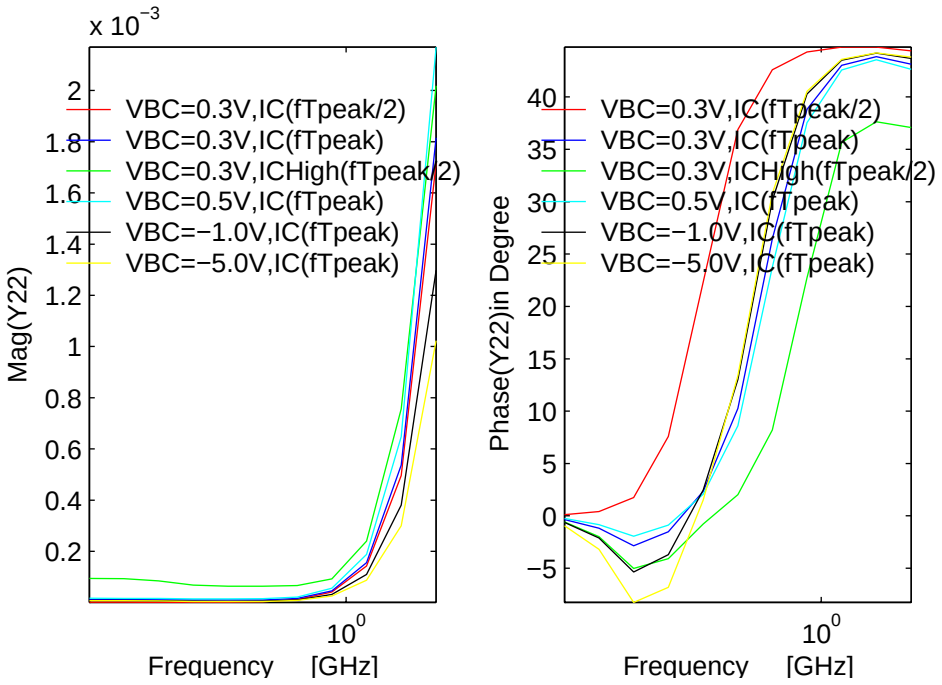

FIGURE 93. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with self-heating effect.

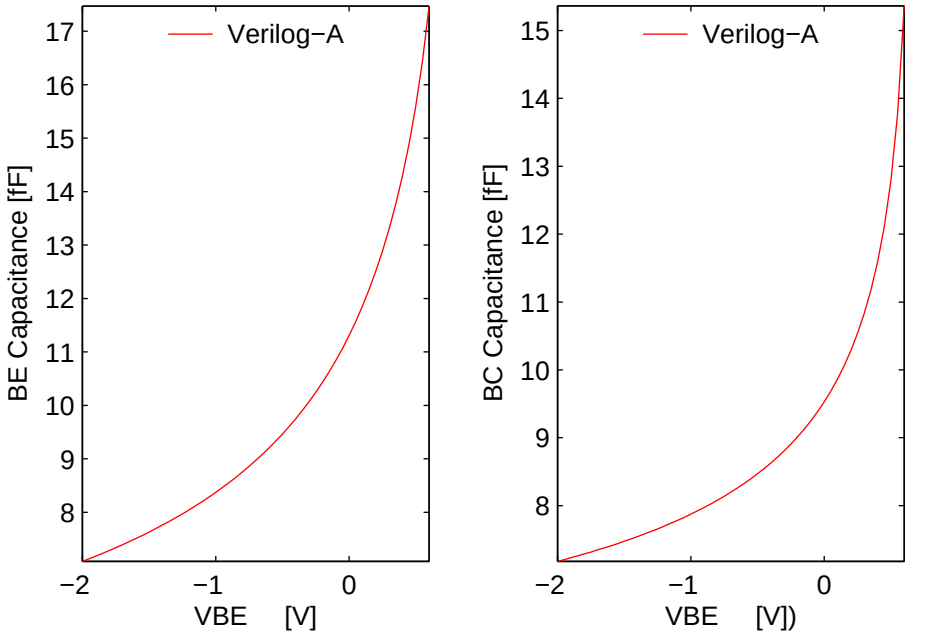

FIGURE 94. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with self-heating effect.

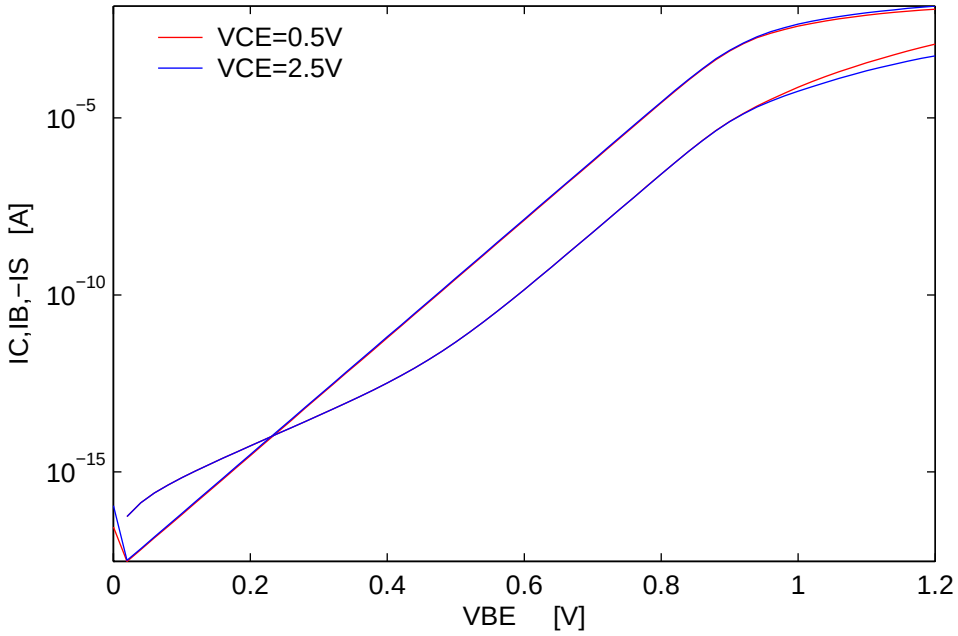

FIGURE 95. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with collector current spreading effect.

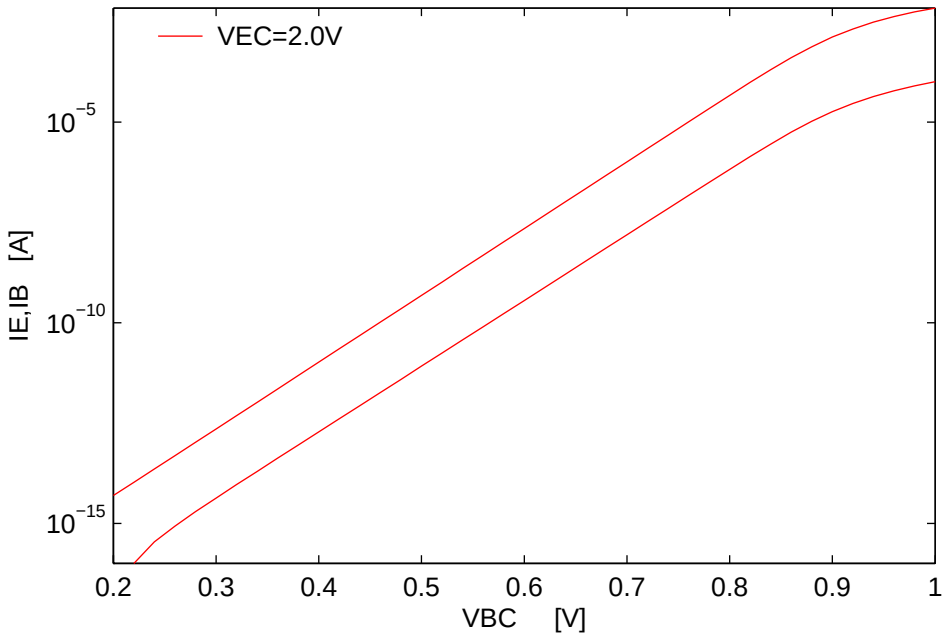

FIGURE 96. Reverse Gummel plots at VEC=2.0V at T=300K with collector current spreading effect.

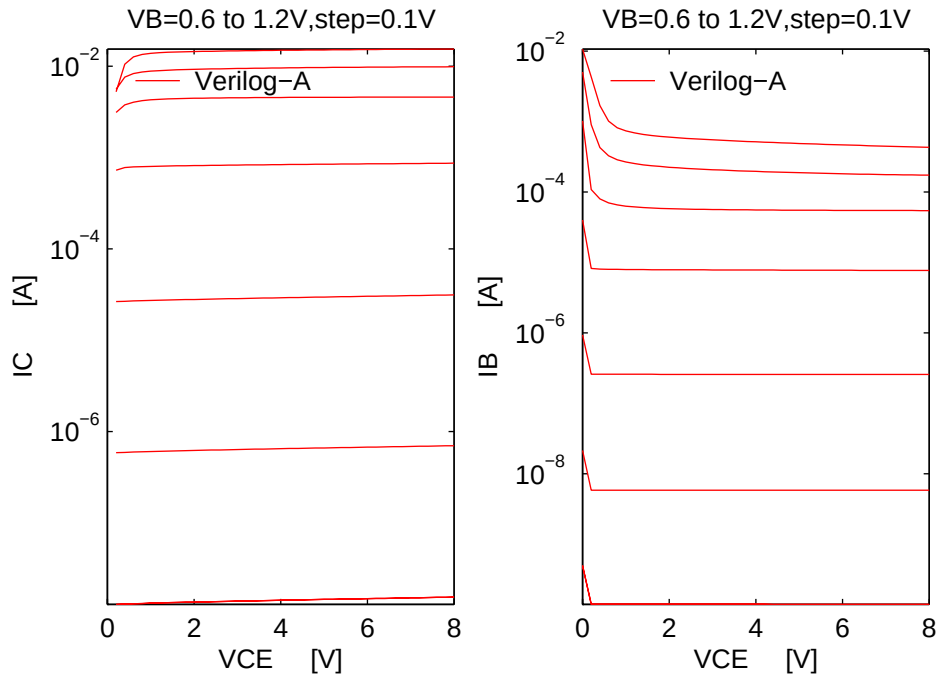

FIGURE 97. Forced-VB output characteristics and Ib-VCE plots at T=300K with collector current spreading effect.

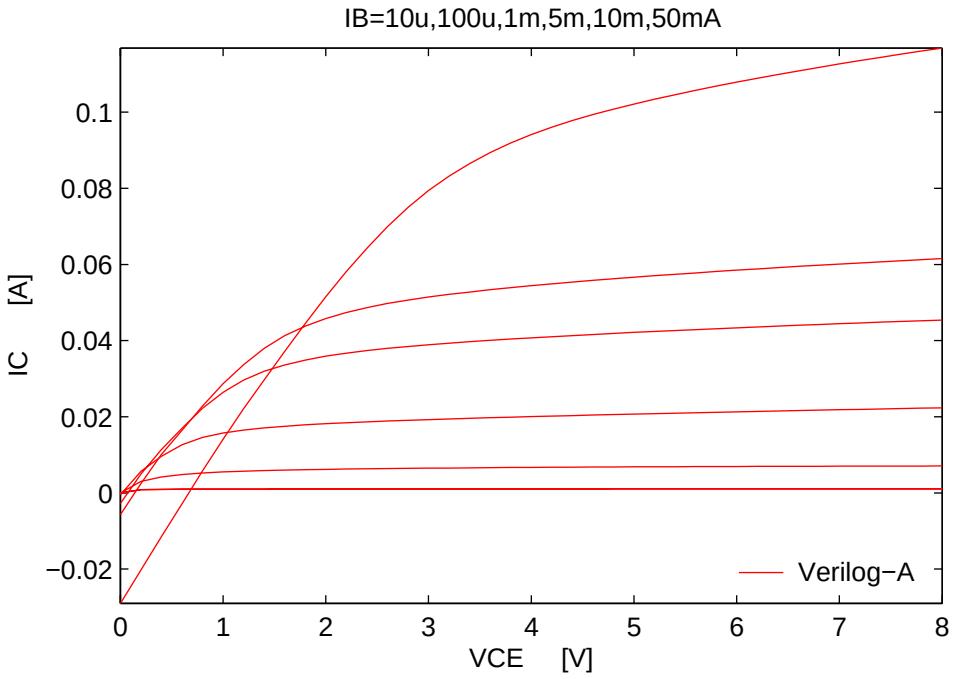

FIGURE 98. Forced-IB output characteristics at T=300K with collector current spreading effect.

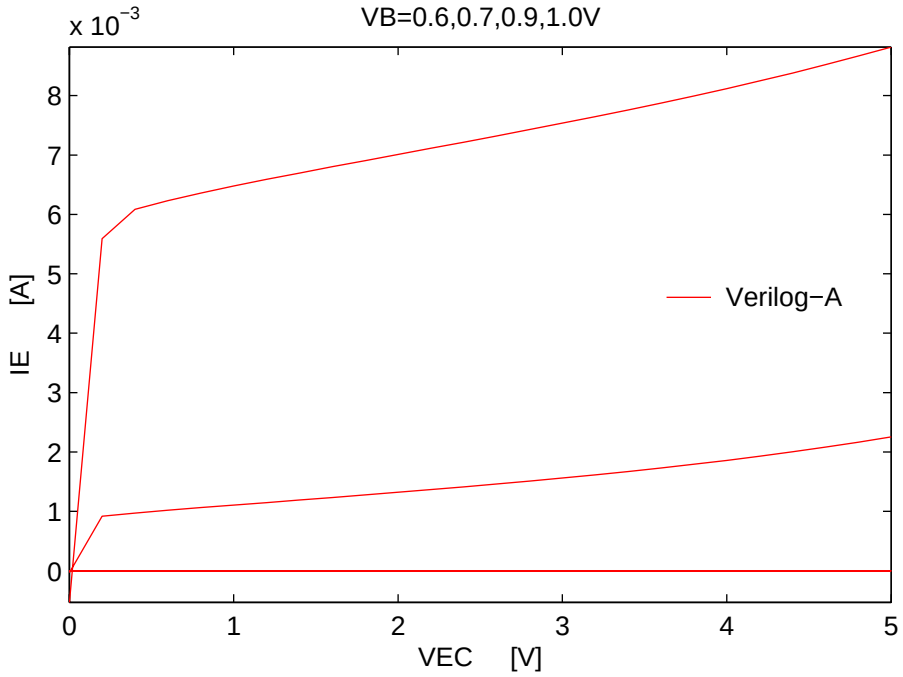

FIGURE 99. Reverse output characteristics at T=300K with collector current spreading effect.

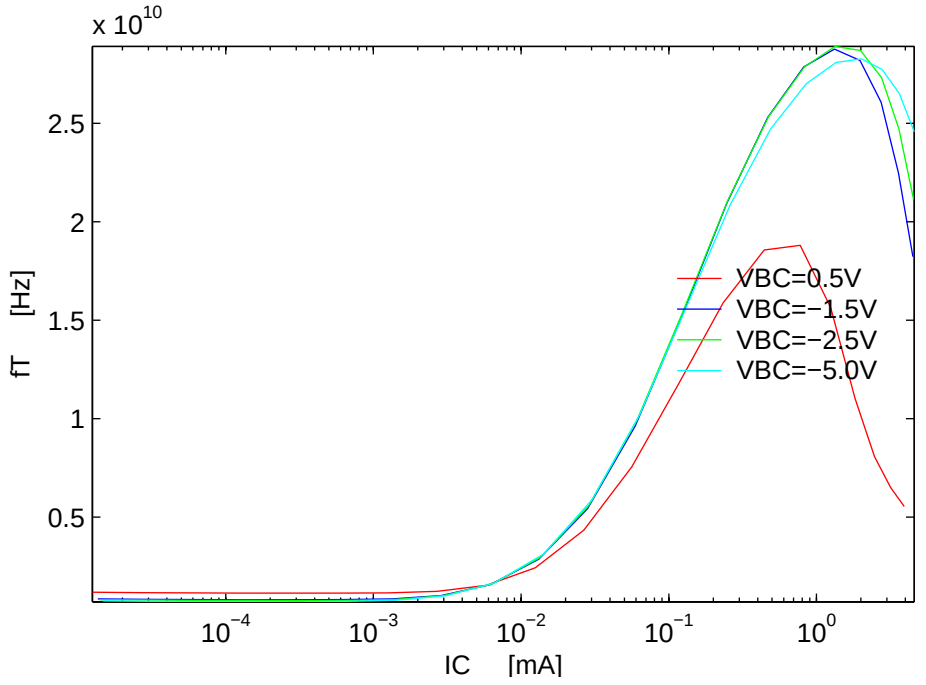

FIGURE 100. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with collector current spreading effect.

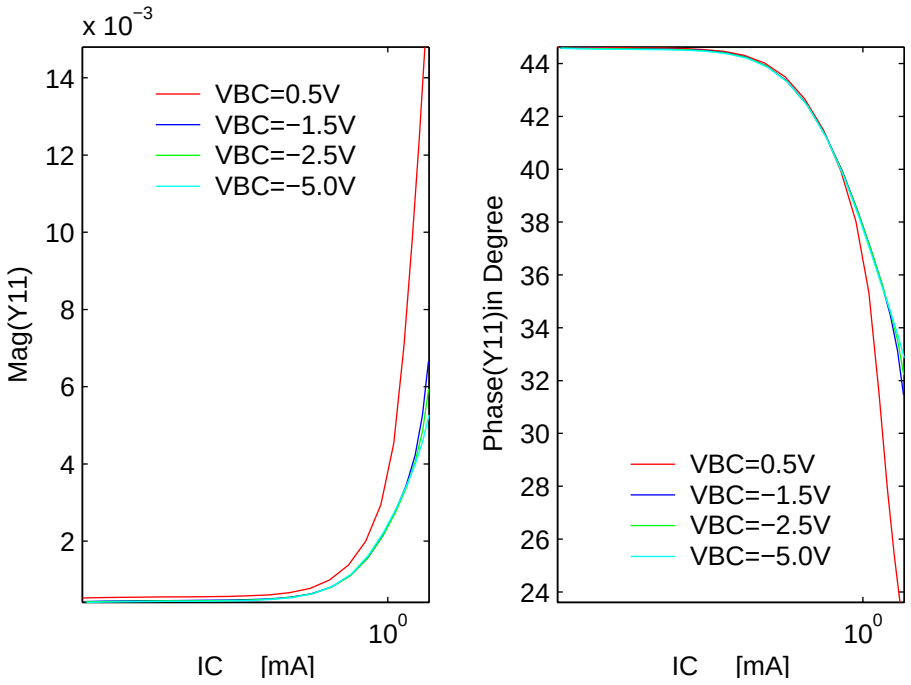

FIGURE 101. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

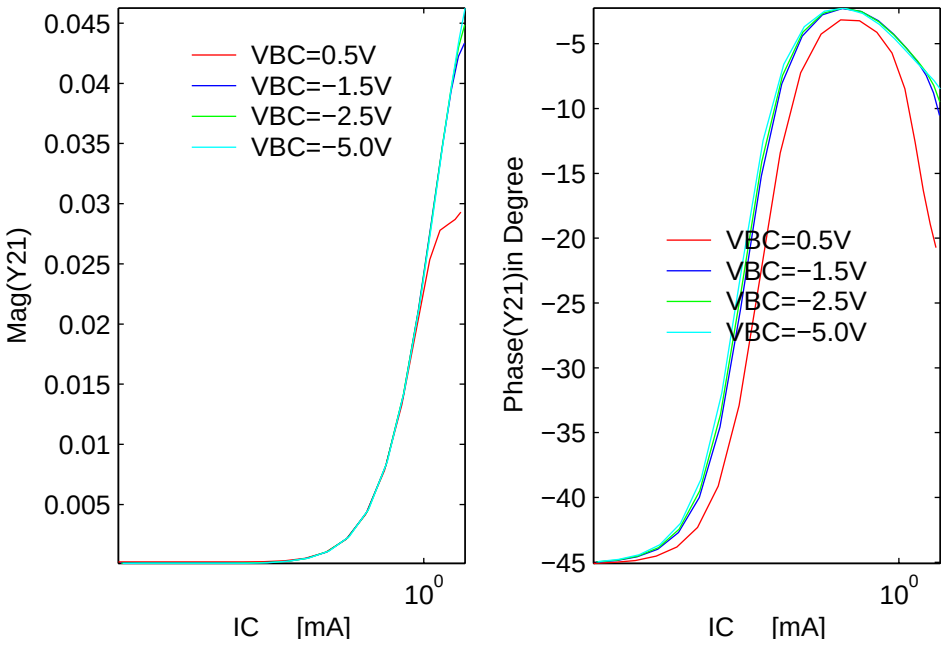

FIGURE 102. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

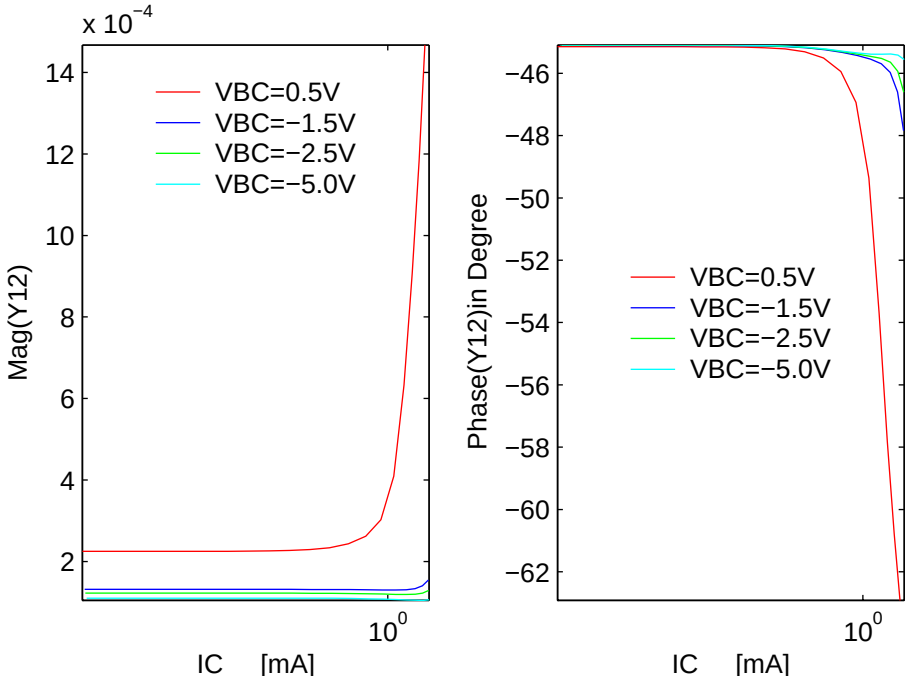

FIGURE 103. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

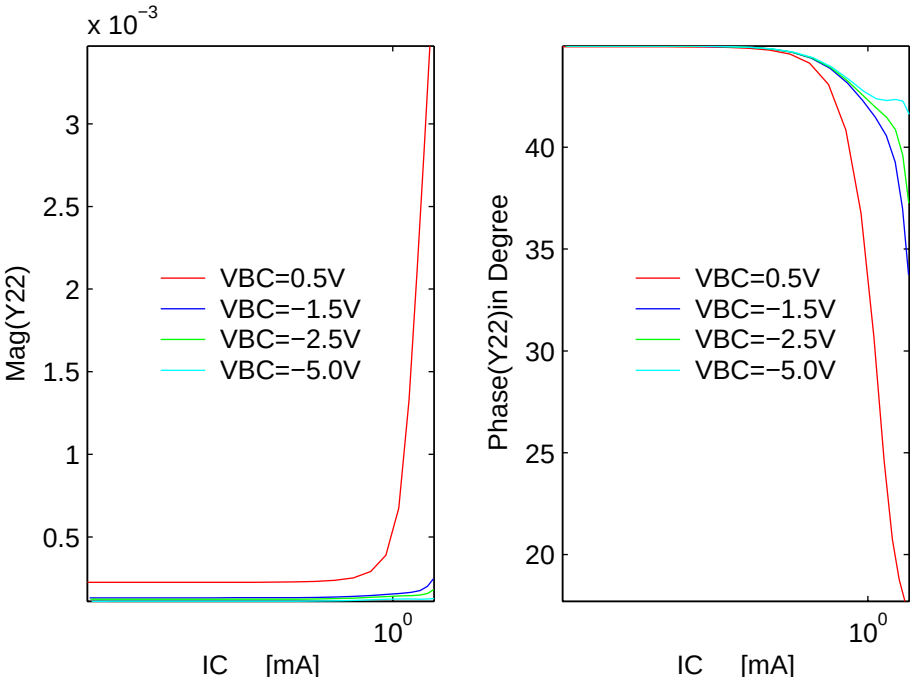

FIGURE 104. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with collector current spreading effect.

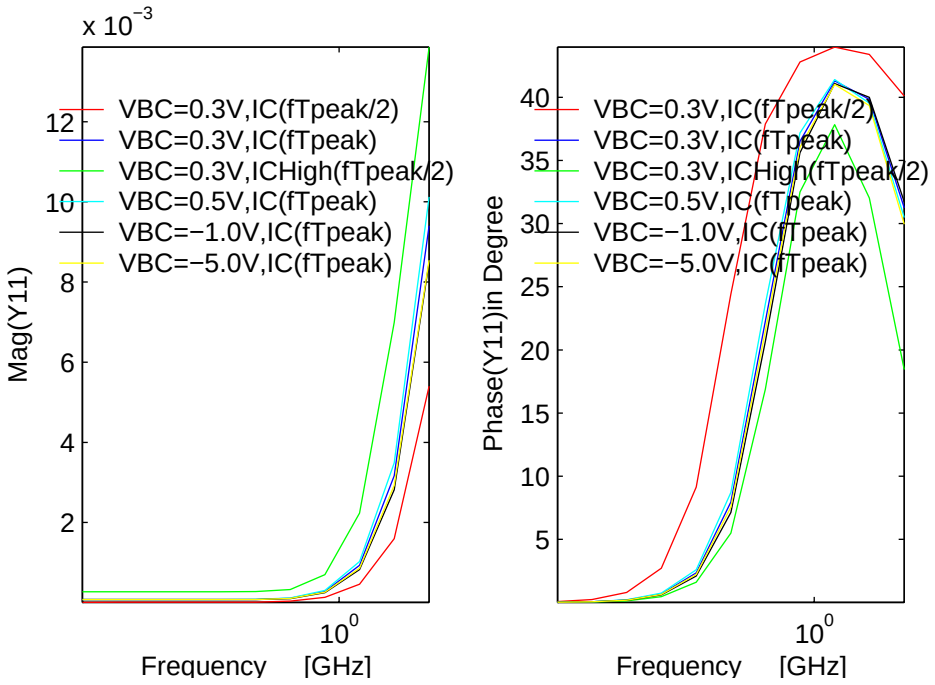

FIGURE 105. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

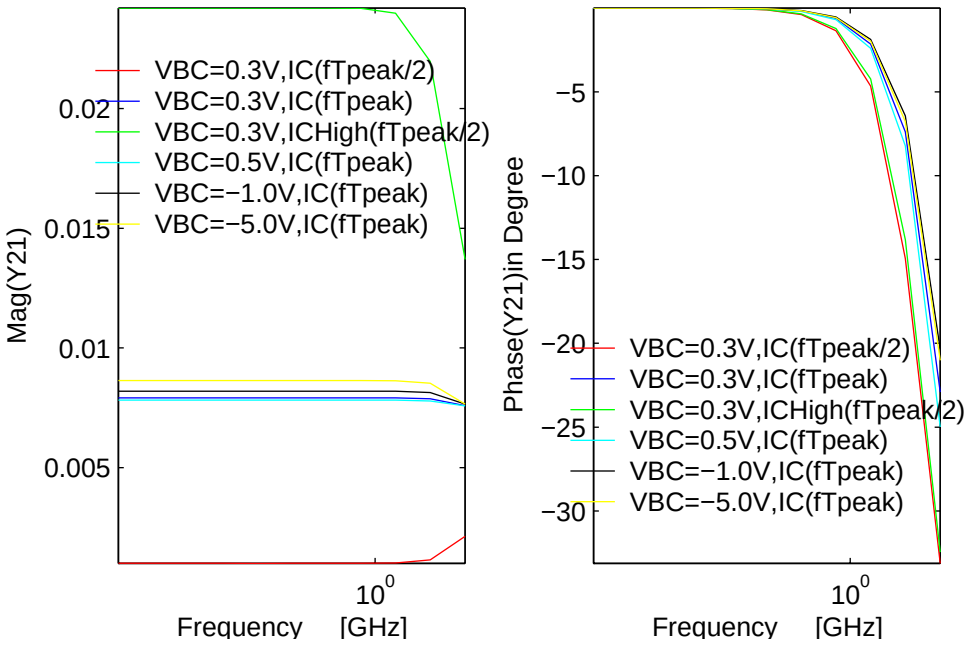

FIGURE 106. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

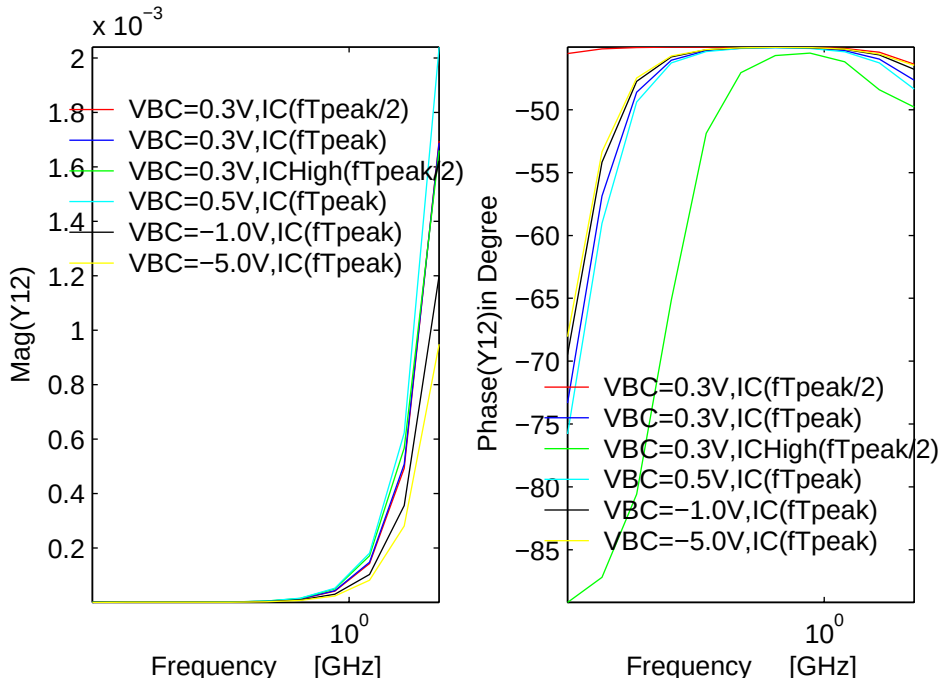

FIGURE 107. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

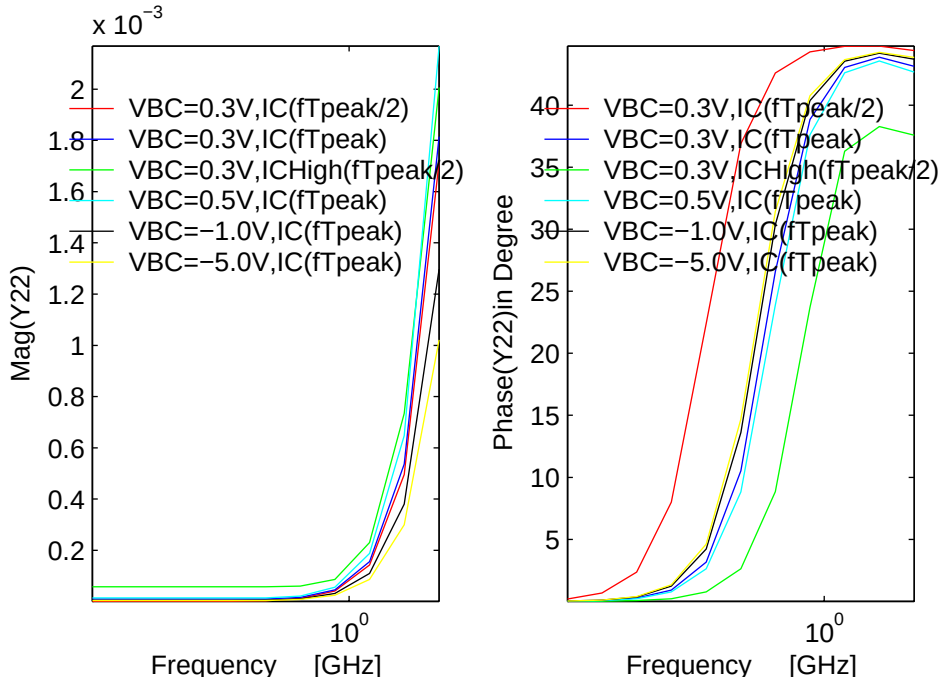

FIGURE 108. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with collector current spreading effect.

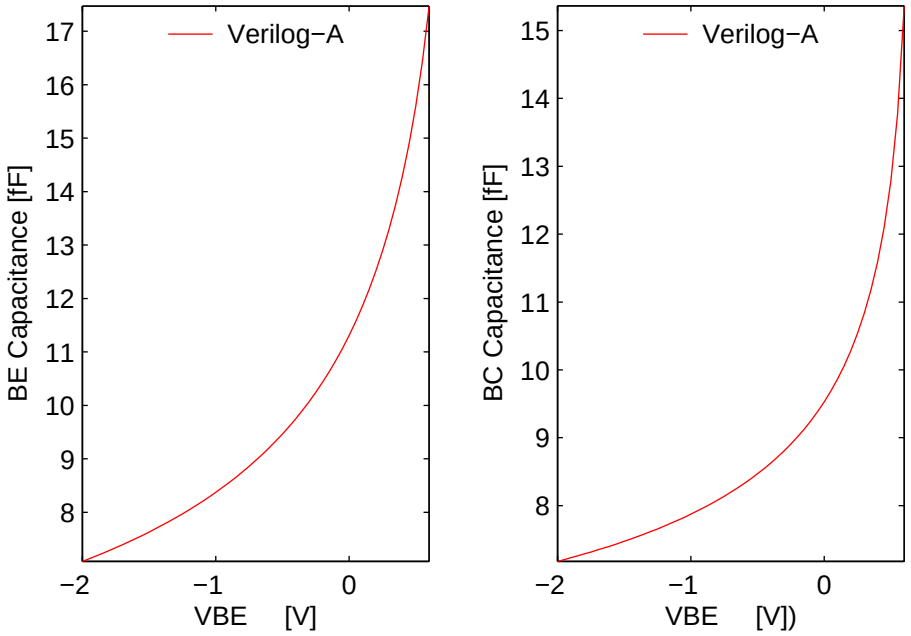

FIGURE 109. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with collector current spreading effect.

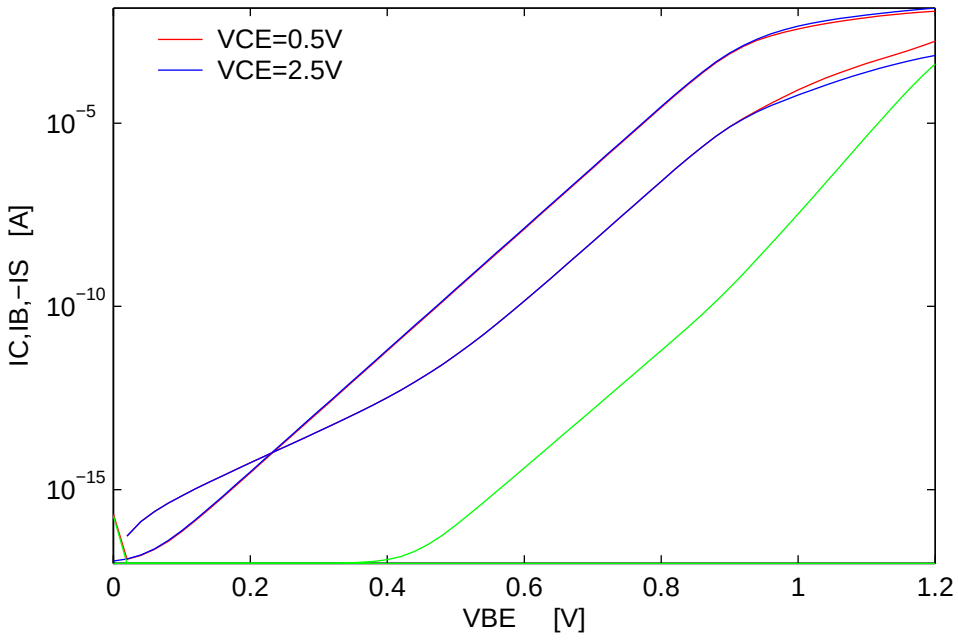

FIGURE 110. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with substrate transistor but without substrate network.

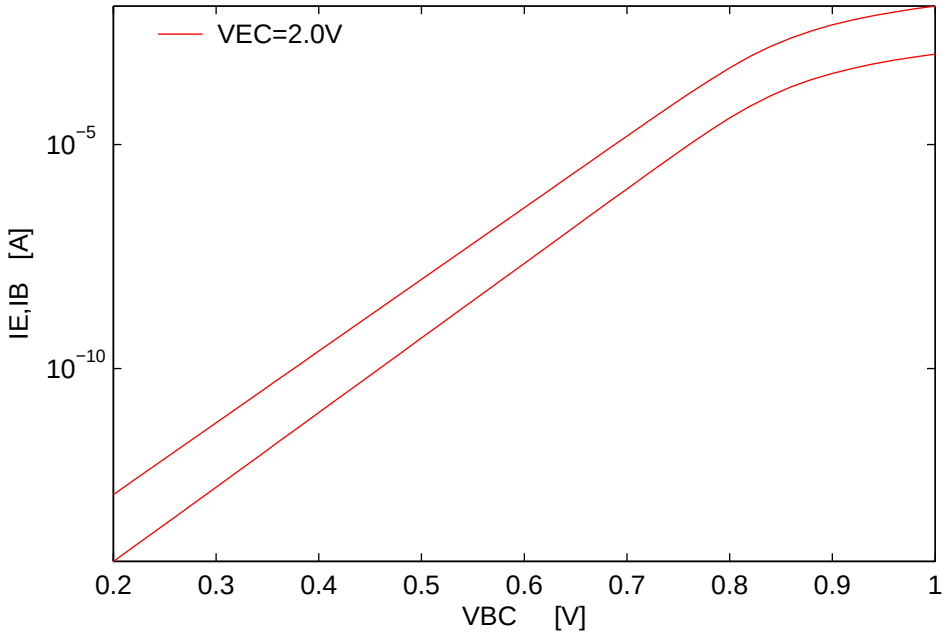

FIGURE 111. Reverse Gummel plots at VEC=2.0V at T=300K with substrate transistor but without substrate network.

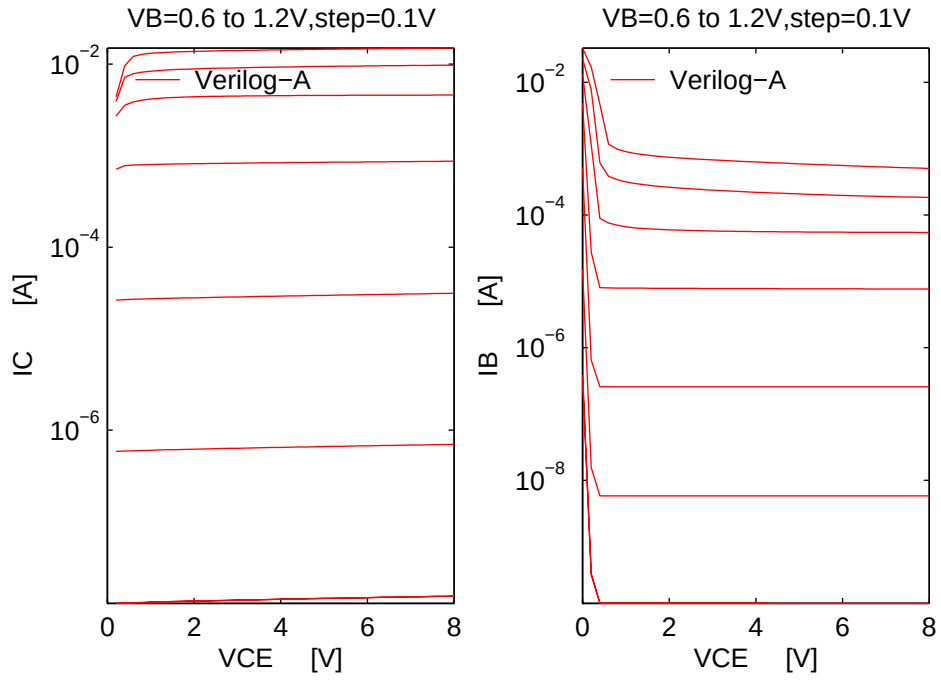

FIGURE 112. Forced-VB output characteristics and Ib-VCE plots at T=300K with substrate transistor but without substrate network.

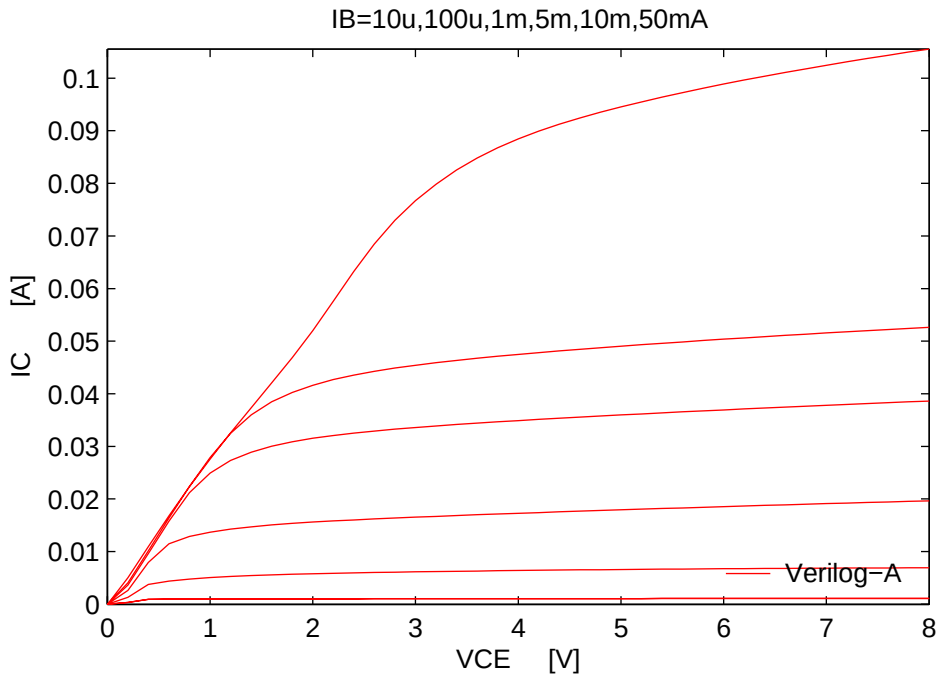

FIGURE 113. Forced-IB output characteristics at T=300K with substrate transistor but without substrate network.

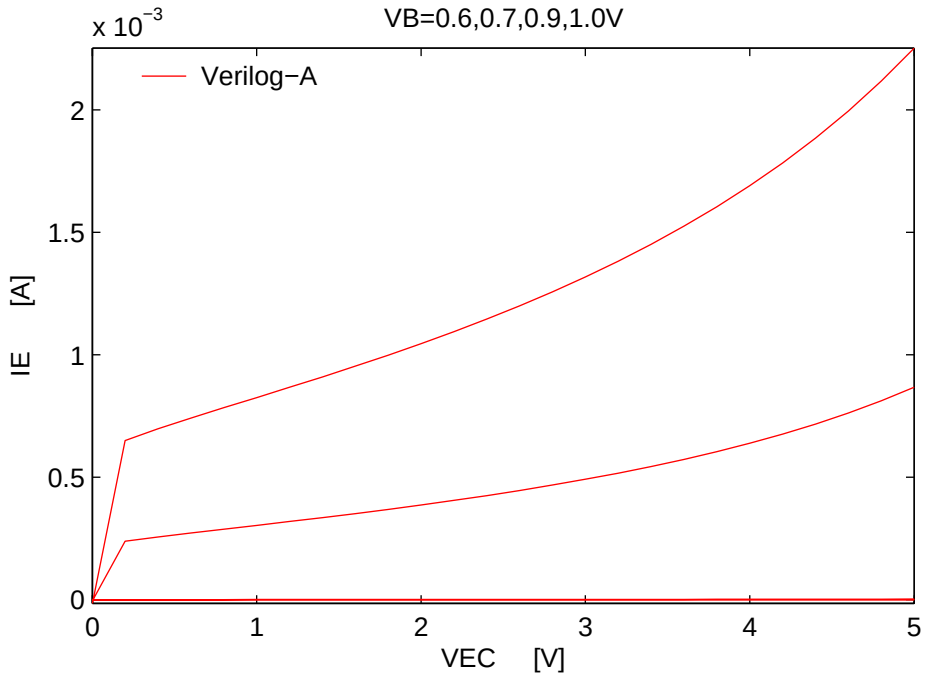

FIGURE 114. Reverse output characteristics at T=300K with substrate transistor but without substrate network.

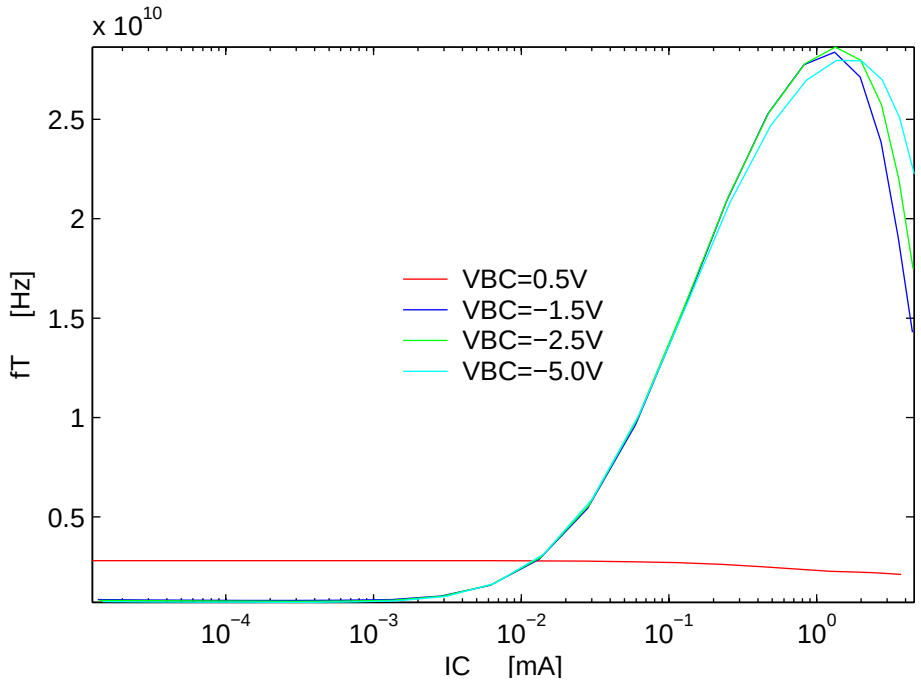

FIGURE 115. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with substrate transistor but without substrate network.

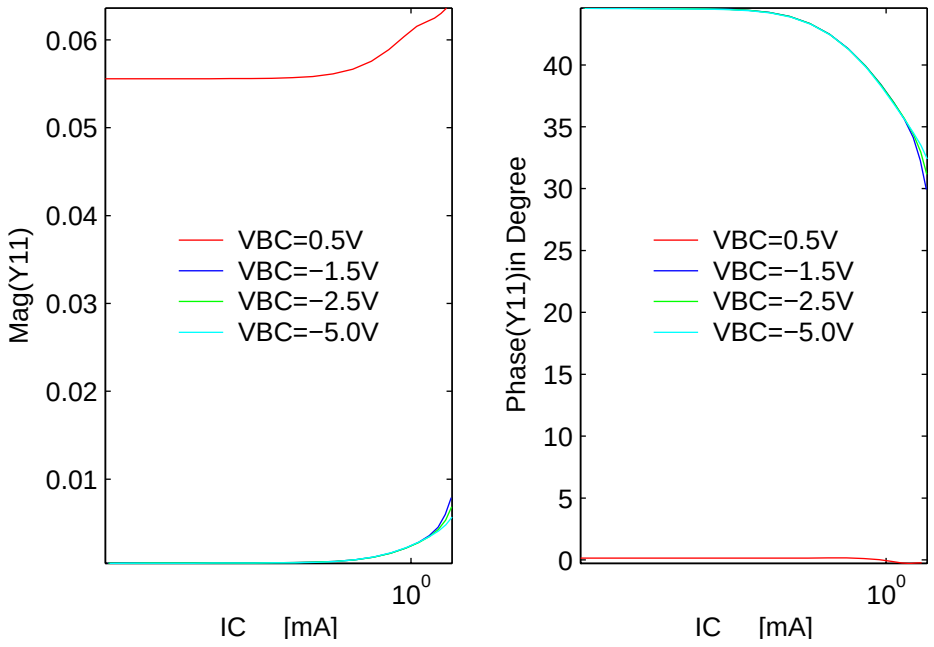

FIGURE 116. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor but without substrate network.

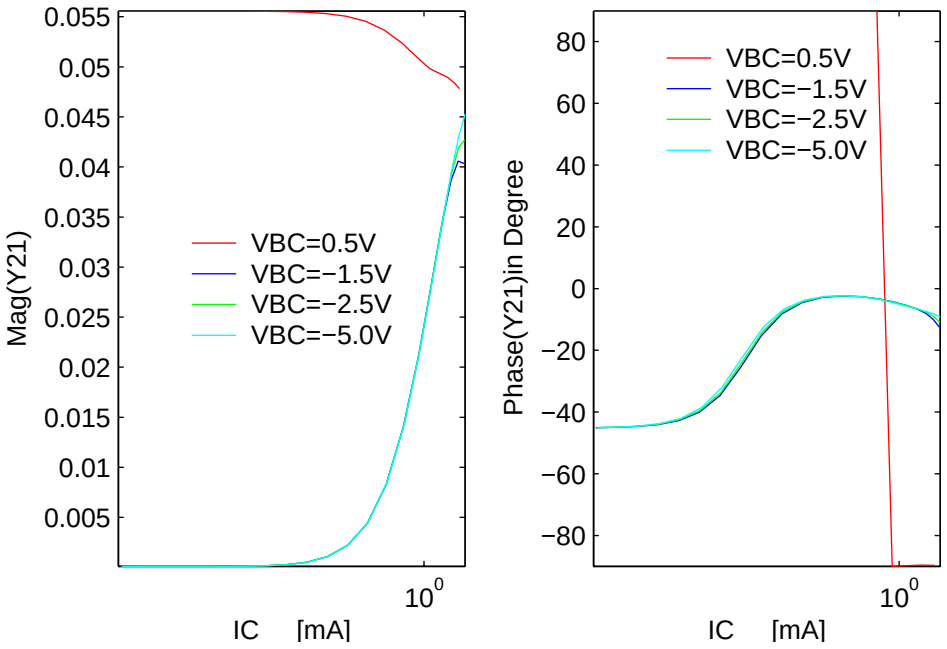

FIGURE 117. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor but without substrate network.

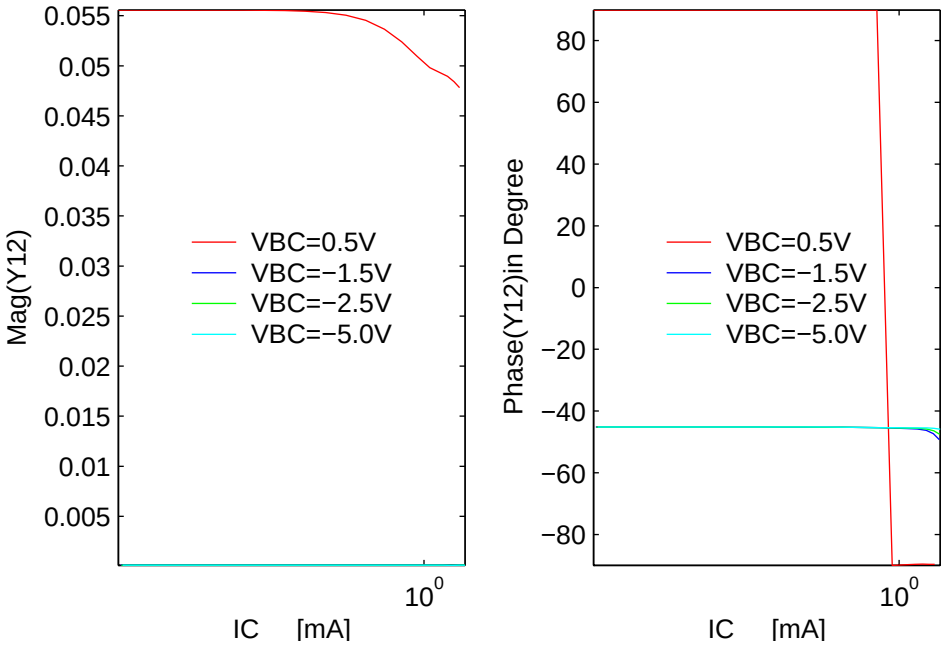

FIGURE 118. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor but without substrate network.

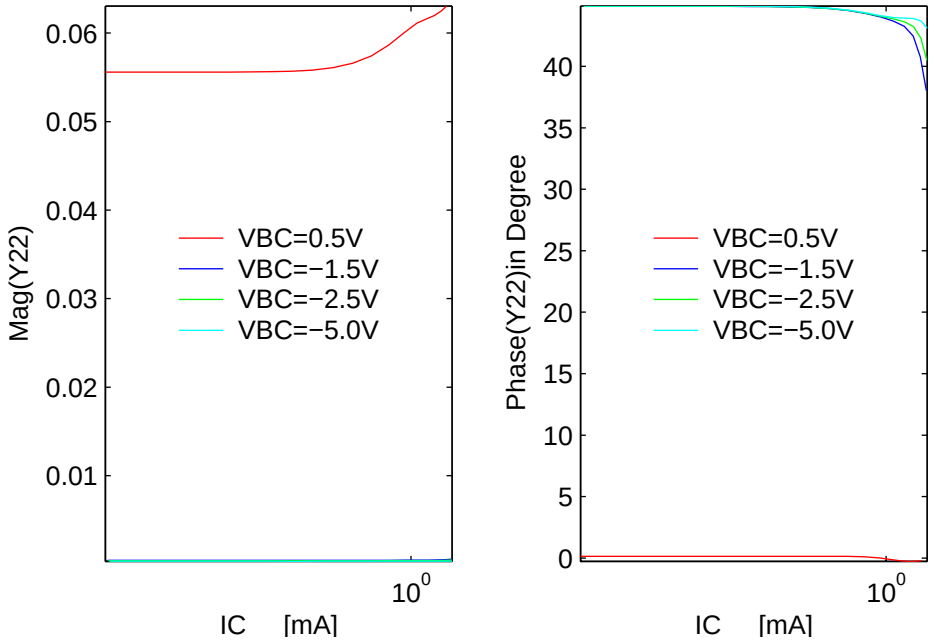

FIGURE 119. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor but without substrate network.

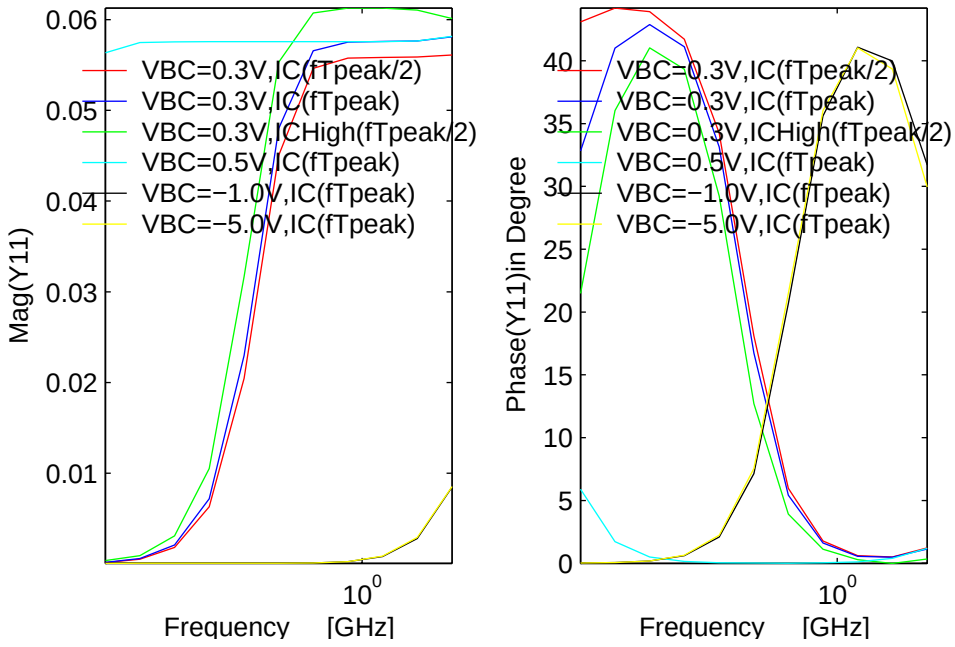

FIGURE 120. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor but without substrate network.

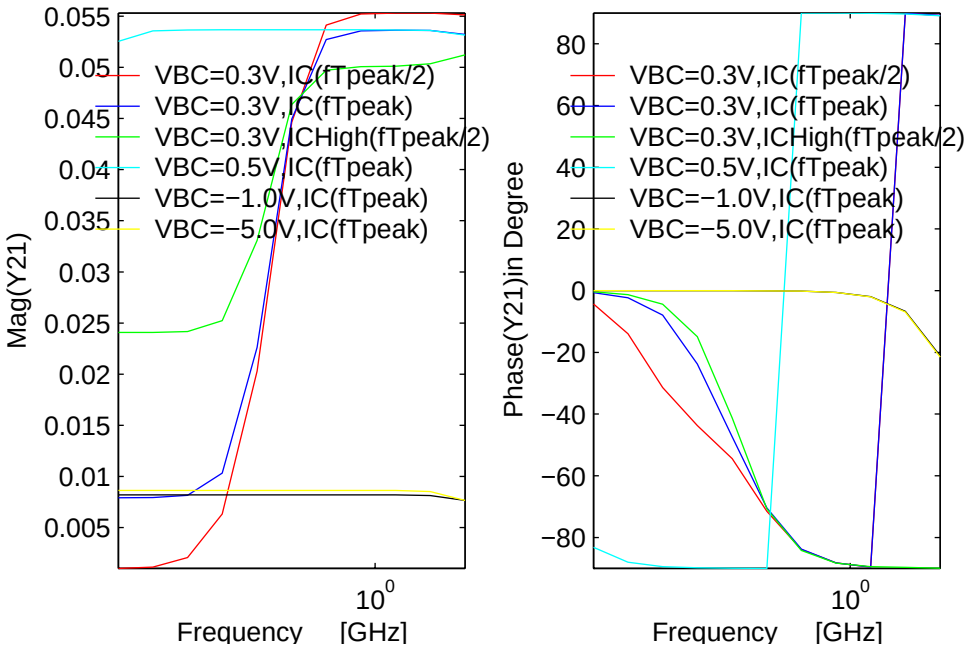

FIGURE 121. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor but without substrate network.

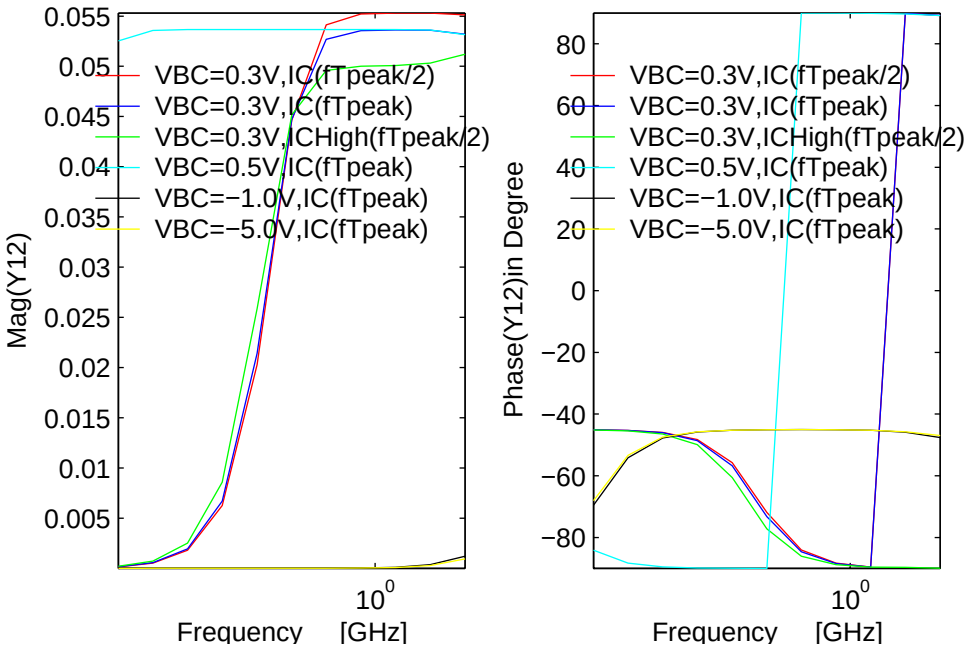

FIGURE 122. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor but without substrate network.

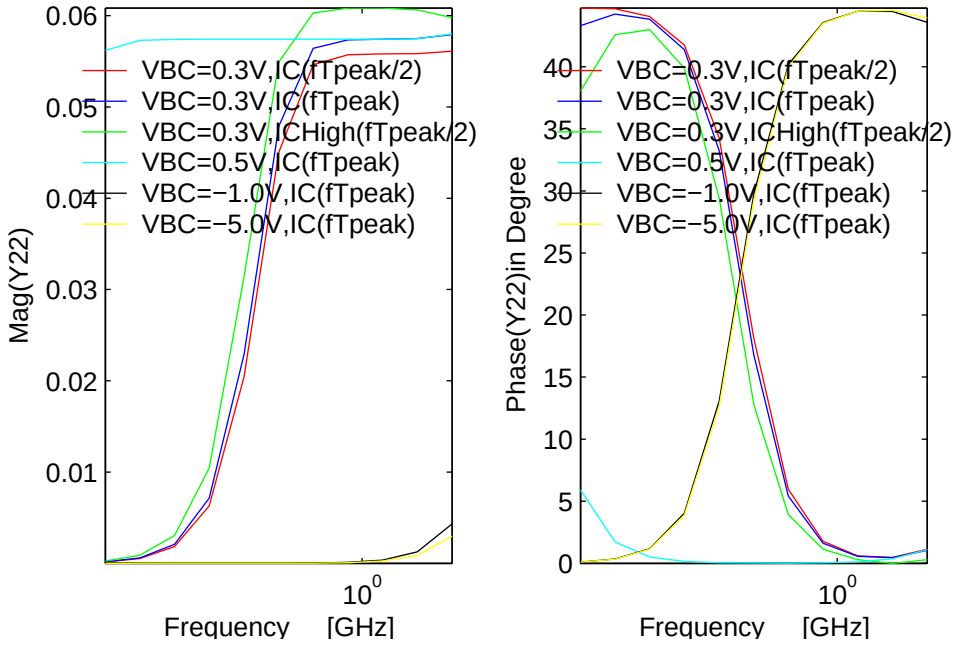

FIGURE 123. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor but without substrate network.

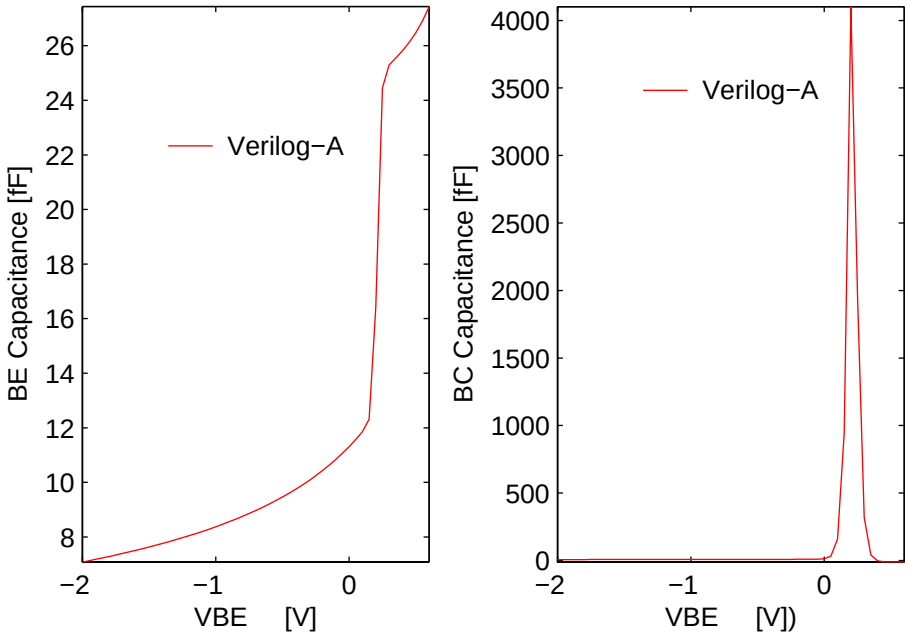

FIGURE 124. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with substrate transistor but without substrate network calculated from Y-parameters.

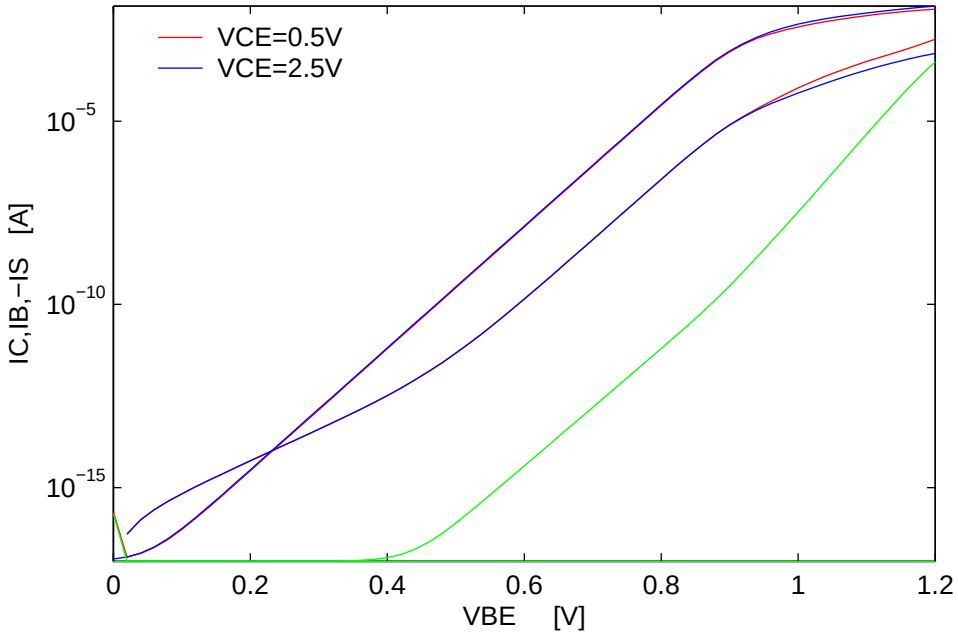

FIGURE 125. Forward Gummel plots at VCE=0.5,2.5 Volt and T=300K with substrate transistor as well as substrate network.

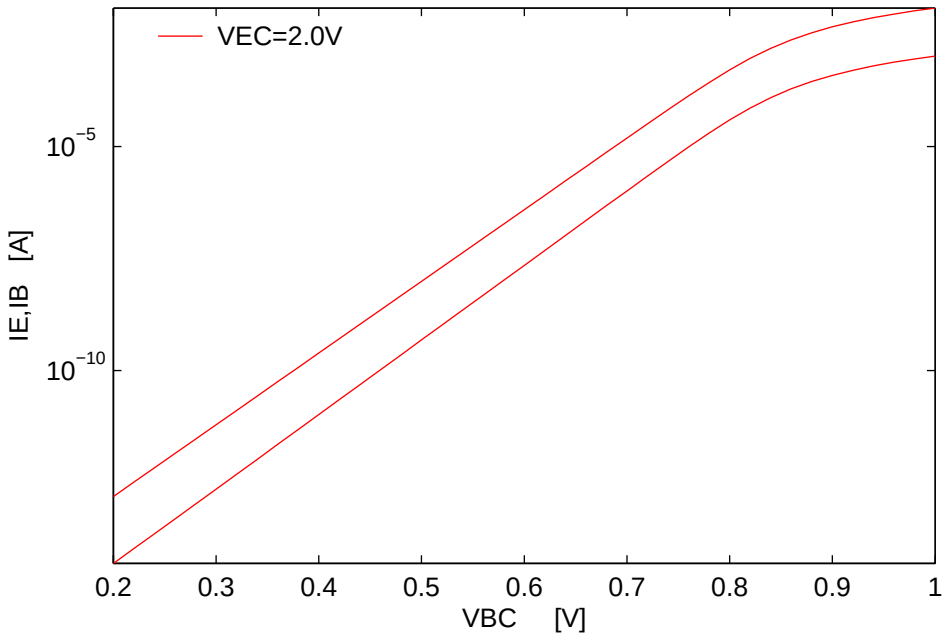

FIGURE 126. Reverse Gummel plots at VEC=2.0V at T=300K with substrate transistor as well as substrate network.

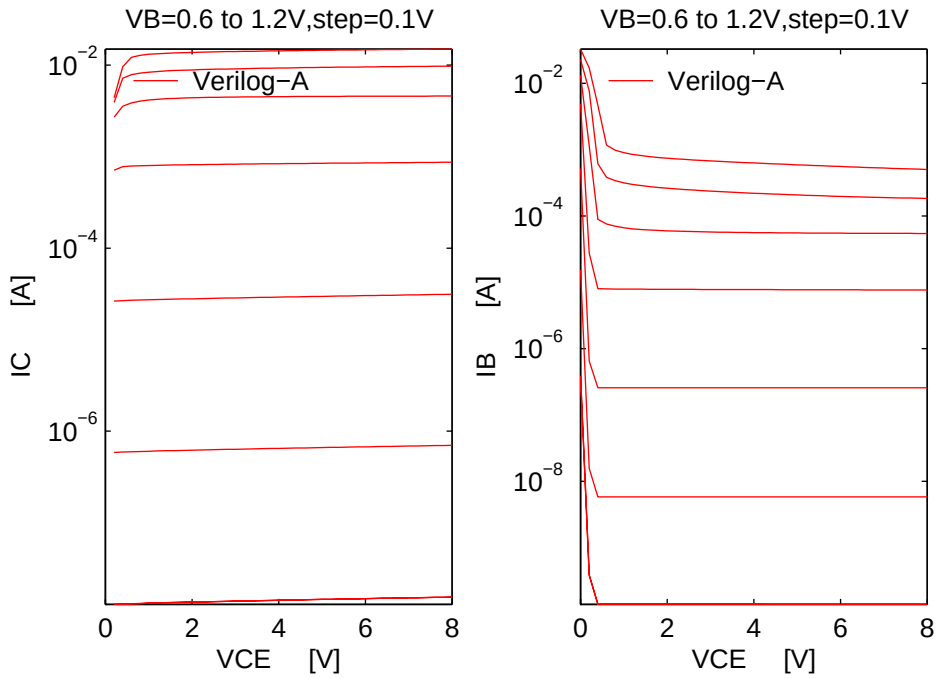

FIGURE 127. Forced-VB output characteristics and Ib-VCE plots at T=300K with substrate transistor as well as substrate network.

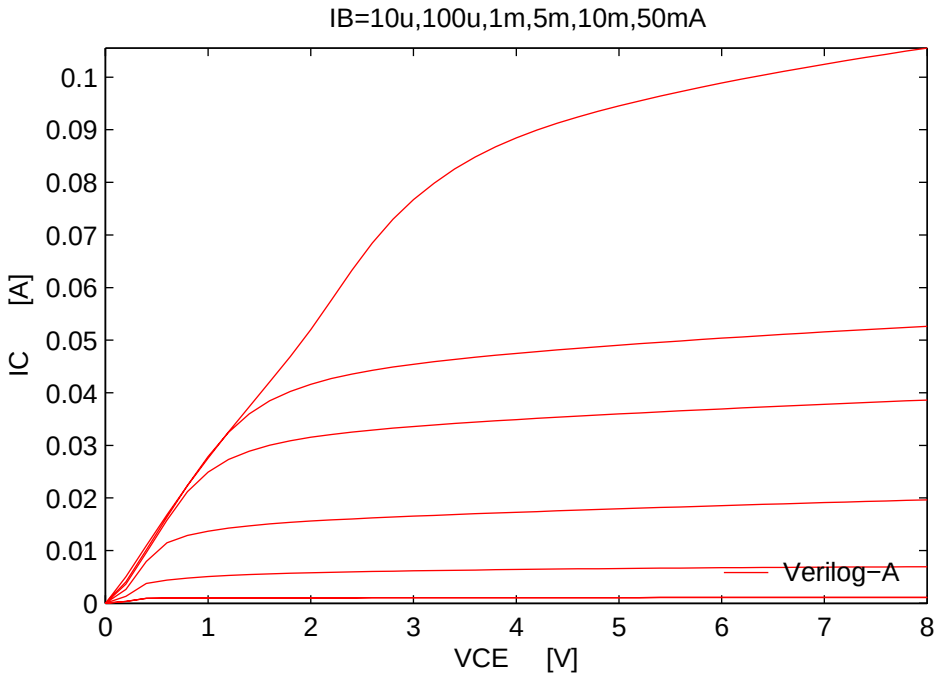

FIGURE 128. Forced-IB output characteristics at T=300K with substrate transistor as well as substrate network.

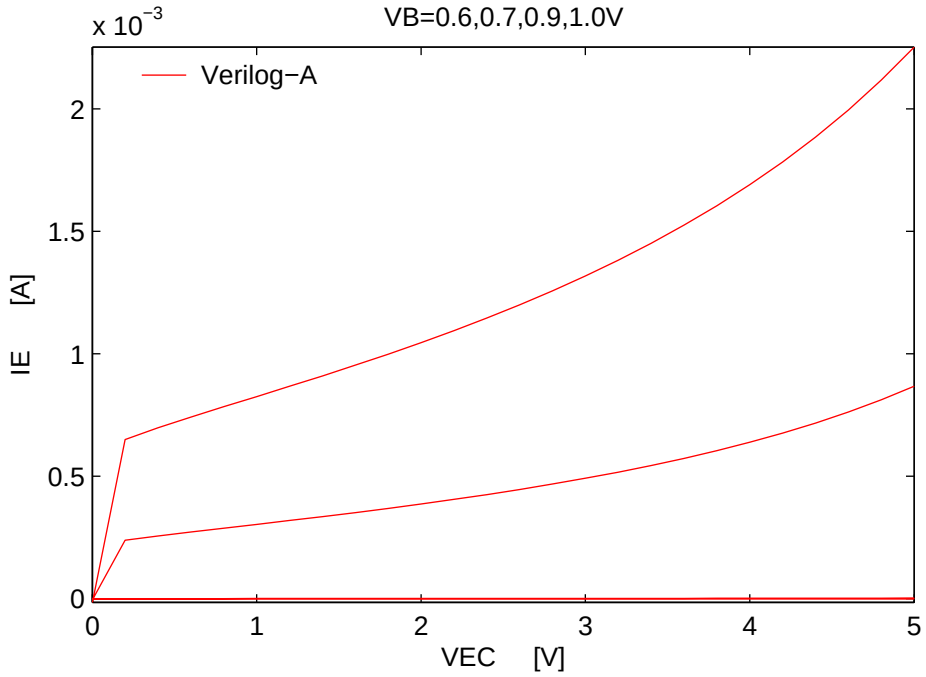

FIGURE 129. Reverse output characteristics at T=300K with substrate transistor as well as substrate network.

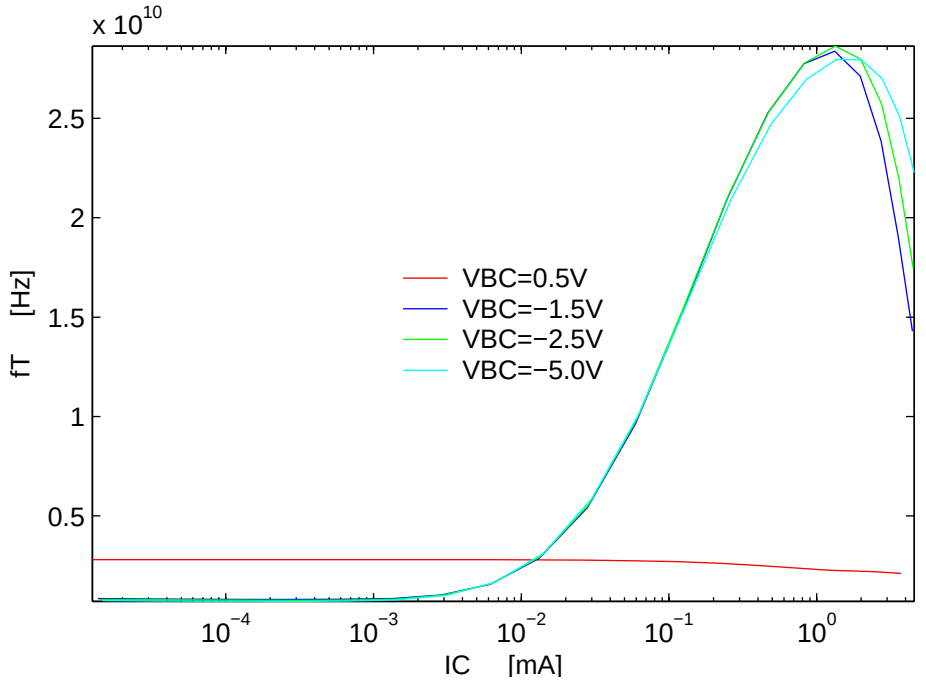

FIGURE 130. fT(Hz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V, fT extracted at f=2.8GHz with substrate transistor as well as substrate network.

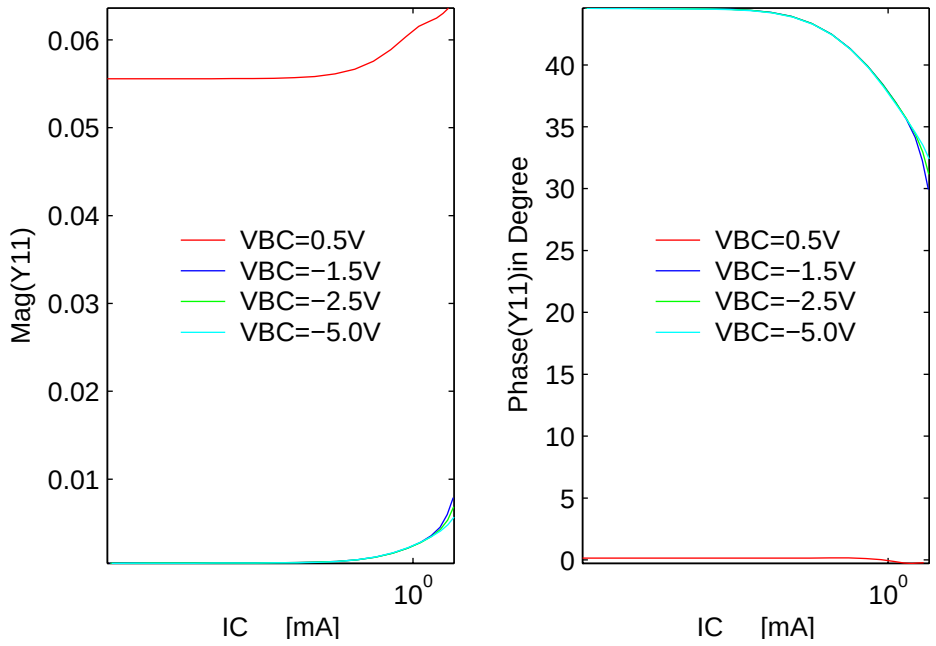

FIGURE 131. Y11 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor as well as substrate network.

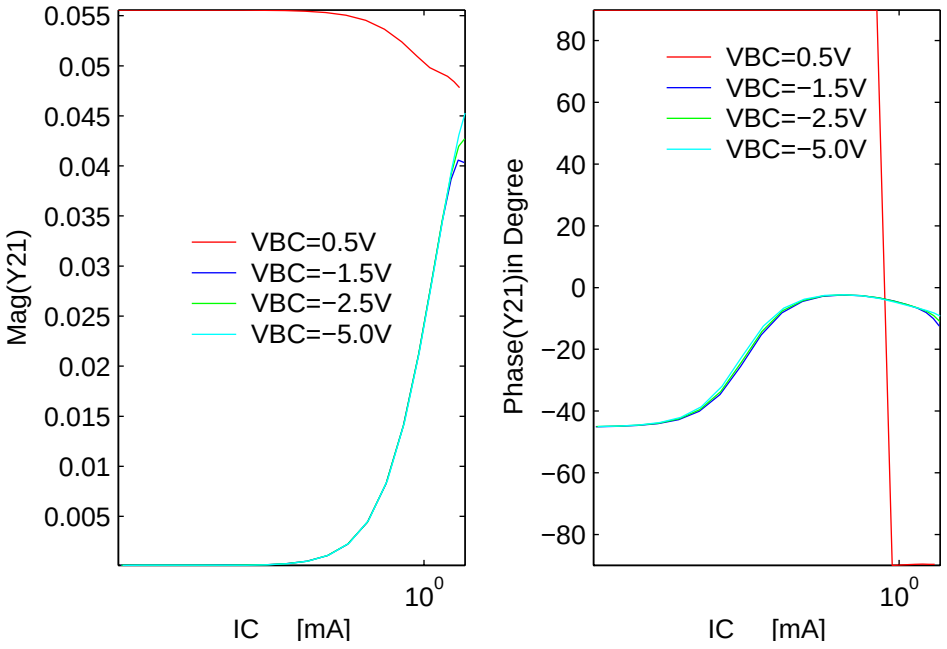

FIGURE 132. Y21 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor as well as substrate network.

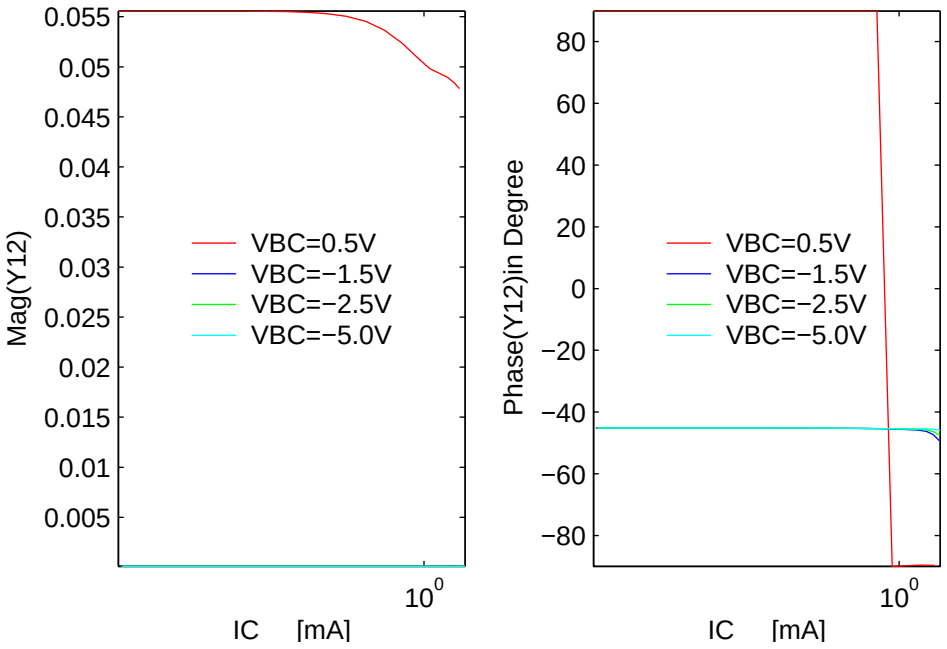

FIGURE 133. Y12 (extracted at 2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor as well as substrate network.

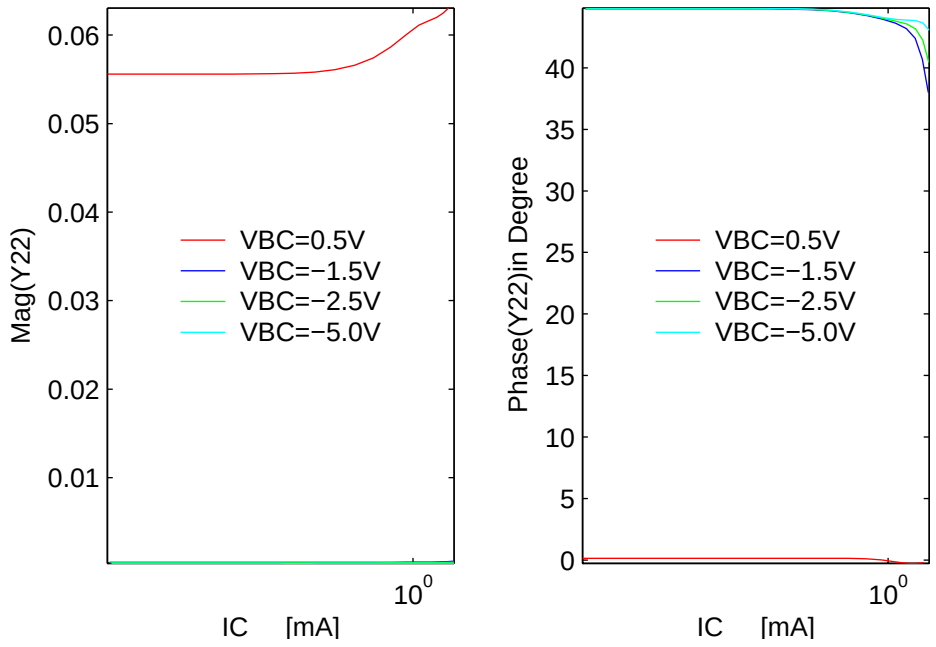

FIGURE 134. Y22 (extracted at f=2.8GHz) vs IC(mA) plots at T=300K for Vbc=0.5,-1.5,-2.5, and -5V with substrate transistor as well as substrate network.

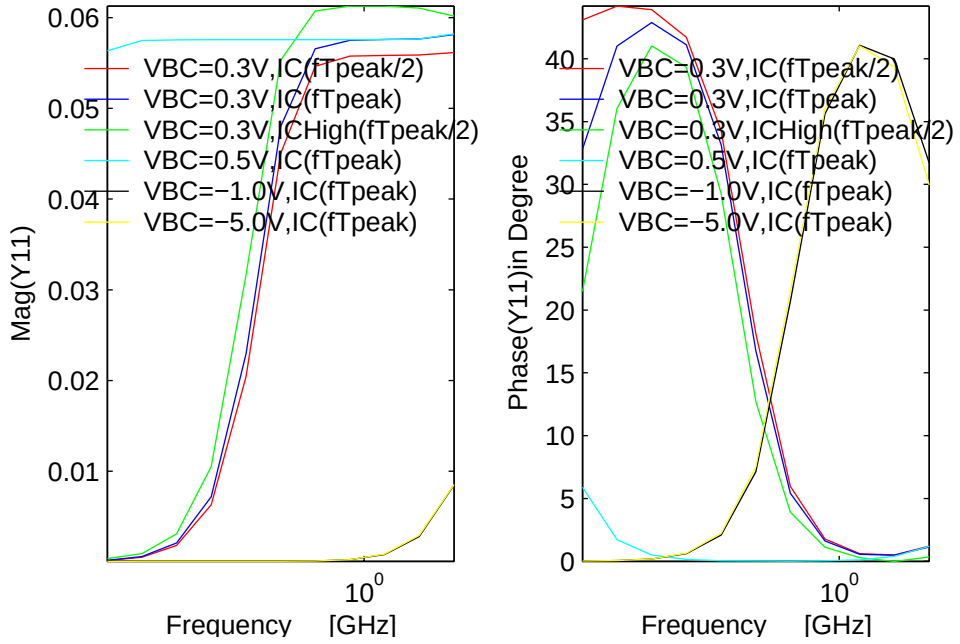

FIGURE 135. Y11 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor as well as substrate network.

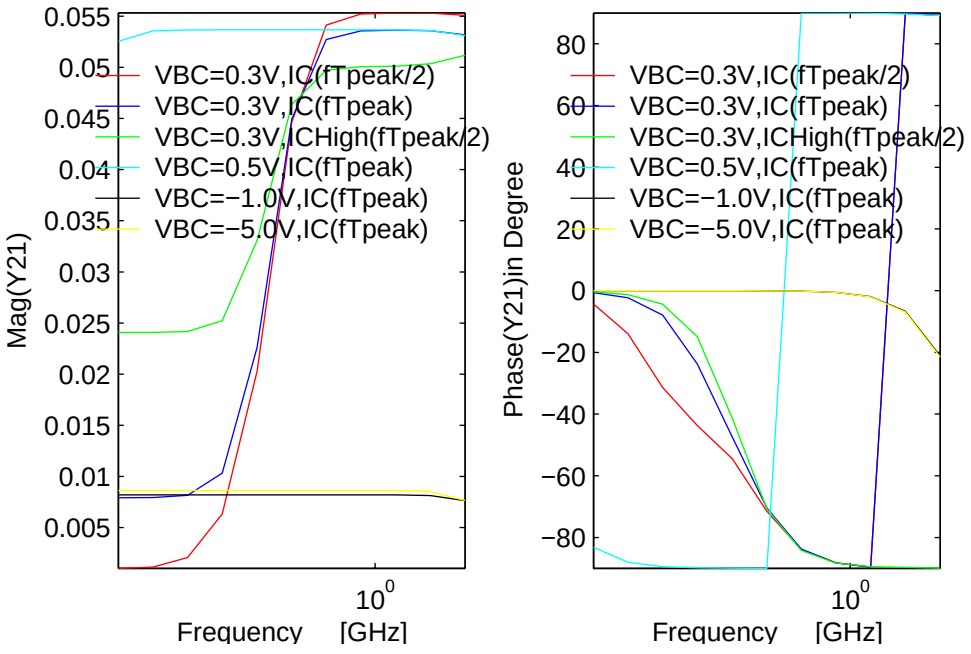

FIGURE 136. Y21 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor as well as substrate network.

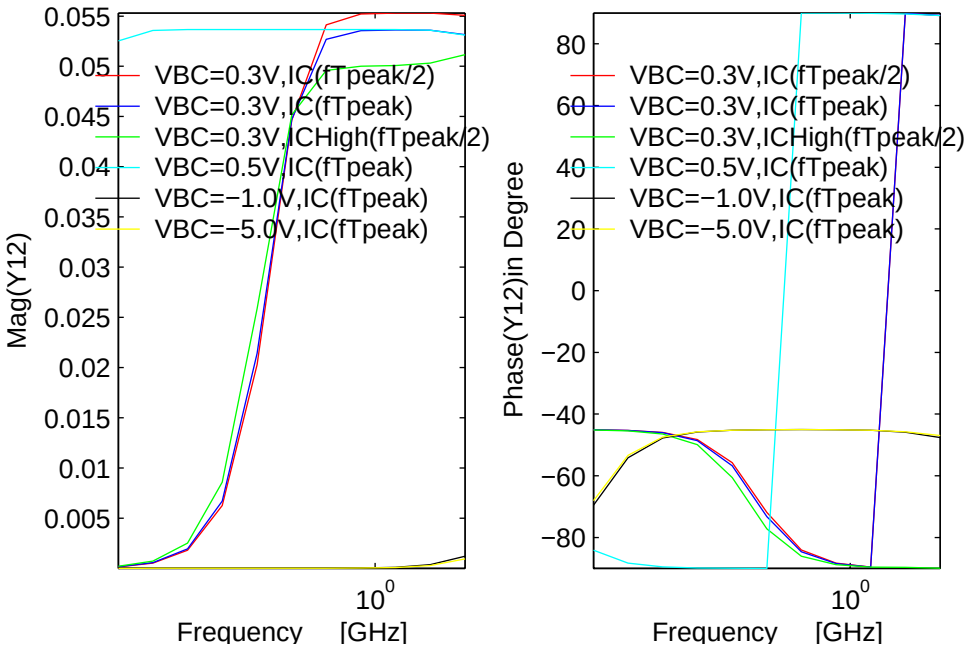

FIGURE 137. Y12 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0, -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor as well as substrate network.

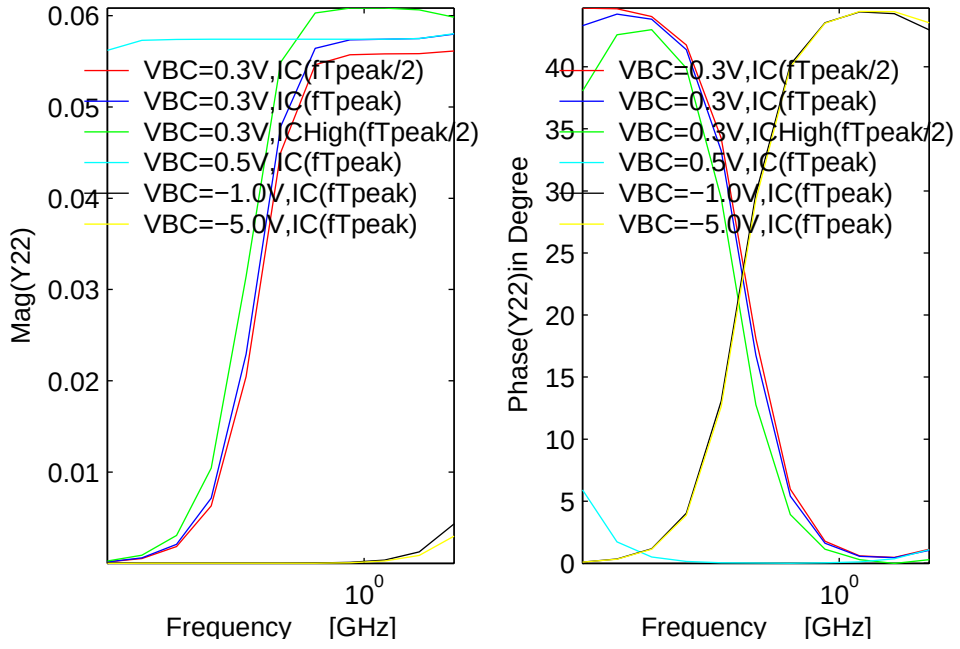

FIGURE 138. Y22 vs Frequency(GHz) plots at T=300K, Vbc=0.3, 0.5, -1.0 and -5.0V for IC(fTpeak),IC(ftpeak/2)and IChigh(fTpeak/2) with substrate transistor as well as substrate network.

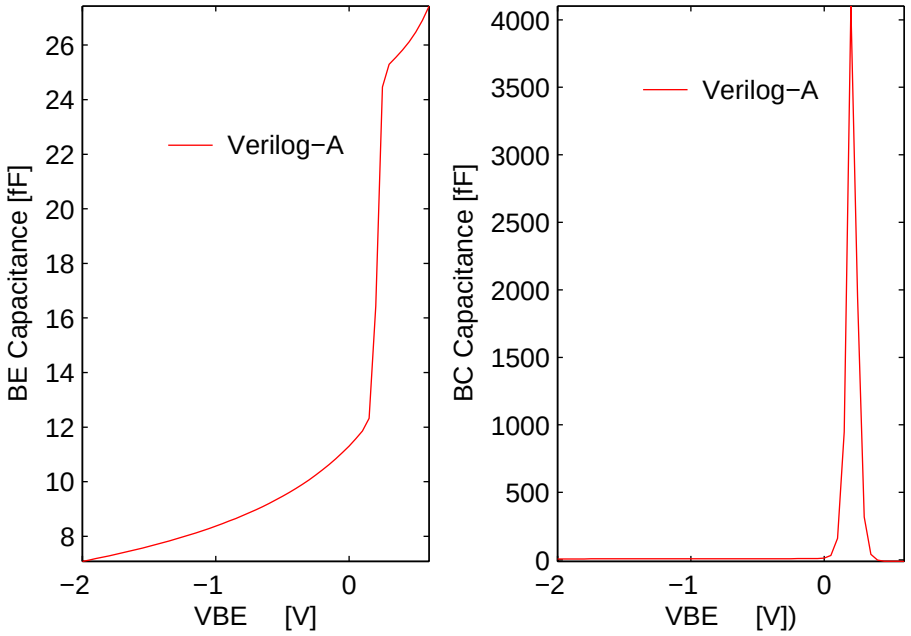

FIGURE 139. Depletion capacitances, Cbe and Cbc (fF) vs BE voltages (Volt) plots at T=300K with substrate transistor as well as substrate network (calculated from Y-parameter).

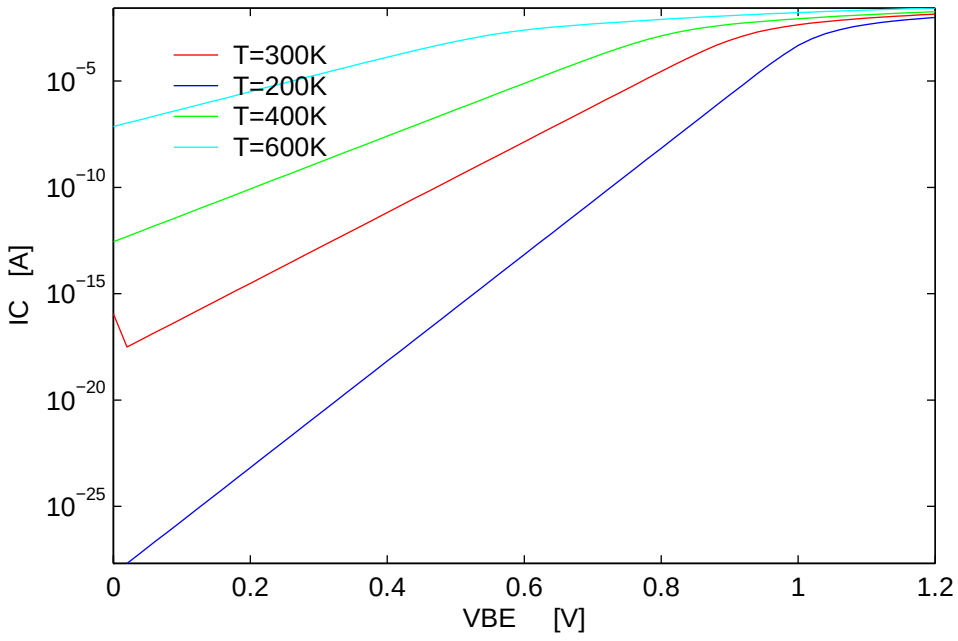

FIGURE 140. IC vs. VBE at VCE=2.5V and T=200K, 300K, 400K, 600K.

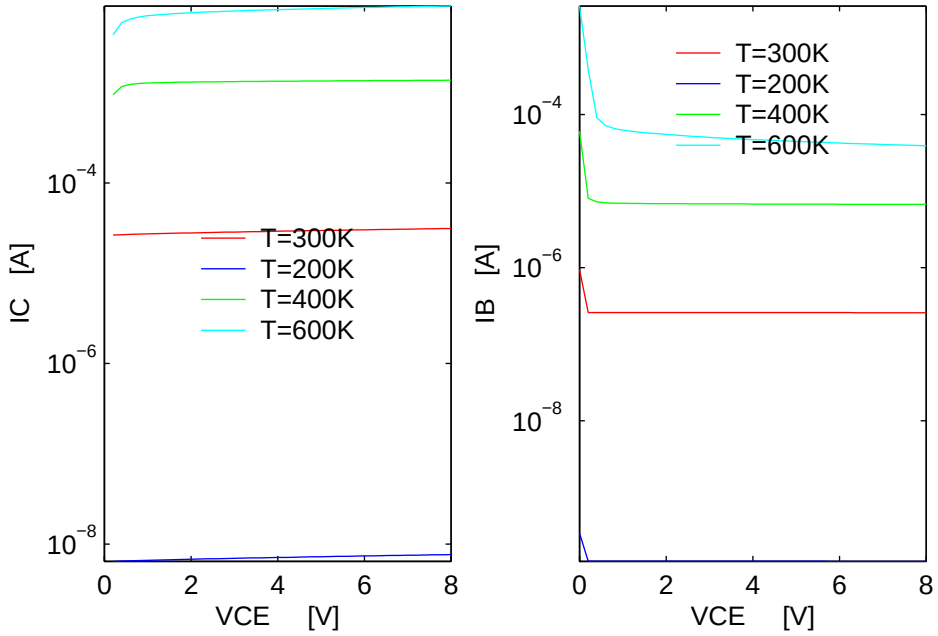

FIGURE 141. IC and IB vs. VCE at VB=0.8V and T=200K, 300K, 400K, 600K.

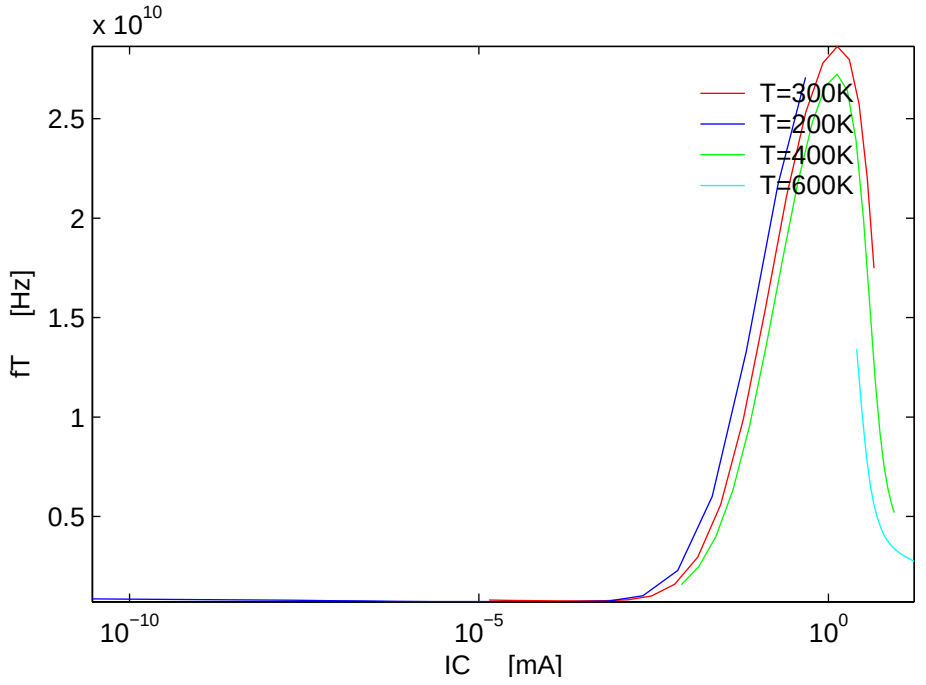

FIGURE 142. fT(Hz) vs. IC(mA) at VBC=-2.5V and T=200K, 300K, 400K, 600K.