Abstracts

Systematic analysis of RF distortion in SiGe HBT's

Guofu Niu, Qingqing Liang, J.D. Cressler, C.S. Webster and D.L. Harame. "Systematic analysis of RF distortion in SiGe HBT's." 2001 Radio Frequency Integrated Circuits (RFIC) Symposium 01. (2001 [RFIC]): 147-150.

A systematic analysis of the RF intermodulation in SiGe HBT's is performed using a new Volterra series-based approach. The relative dominance of individual nonlinearities and their interaction were shown to vary with source/load, bias current, and CB feedback. The C/sub CB/ and avalanche multiplication nonlinearities are the dominant factors in determining the overall linearity, and are responsible for the load dependence. A cancellation mechanism between the avalanche current I/sub CB/ nonlinearity and the CB capacitance C/sub CB/ nonlinearity is identified. The current dependence of avalanche multiplication was shown to be beneficial to linearity. The results suggest that there is a fundamental limit to achieving high f/sub T/ and high linearity and multiple collector profiles need to be used for leverage in RF circuit design.

❑ Return to main document.