Abstracts

Optimum bias conditions for linear broadband InGaP/GaAs HBT power amplifiers (2002 Vol. II [MWSYM])

M. Iwamoto, C.P. Hutchinson, J.B. Scott, T.S. Low, M. Vaidyanathan, P.M. Asbeck and D.C. D'Avanzo. "Optimum bias conditions for linear broadband InGaP/GaAs HBT power amplifiers (2002 Vol. II [MWSYM])." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 901-904 vol.2.

A design strategy for a linear broadband InGaP/GaAs HBT power amplifier is presented. This design takes advantage of the bias dependence of the nonlinear base-collector charge, expressed by the C/sub BC/ vs V/sub CE/ and /spl tau//sub c/ vs I/sub c/ characteristics of the device. Using this technique, it is shown that the second and third order distortions have separate optimum bias conditions, and furthermore, there is an inherent tradeoff in optimizing the second and third order distortions. This strong bias dependence of the nonlinear base-collector charge and the tradeoff between the different orders of distortion are verified on a 24 dBm 0.5-11 GHz distributed power amplifier. To minimize high frequency distortion in HBT amplifiers across a wide range of bias, it is imperative to linearize the base-collector charge, where flat C/sub BC/ vs V/sub CE/ and f/sub t/ vs I/sub c/ characteristics are ideally desired.

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