Abstracts

Push-pull circuits using n-p-n and p-n-p InP-based HBT's for power amplification

D. Sawdai and D. Pavlidis. "Push-pull circuits using n-p-n and p-n-p InP-based HBT's for power amplification." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1439-1448.

P-n-p heterojunction bipolar transistors (HBTs) have been combined with n-p-n HBTs in a push-pull amplifier in order to obtain improved linearity characteristics. Simulations of common-collector push-pull amplifiers demonstrate an improvement of 14 dB in second harmonic content at the onset of power saturation under class-B operation. Further improvement of 14 dB in the third harmonic content is shown by moving to class-AB operation at an expense of 4% decreased efficiency. A common-emitter push-pull amplifier was fabricated using both n-p-n and p-n-p HBTs with external matching and couplers. Testing of the circuit under class-AB conditions showed better third-order intermodulation (by /spl sim/9 dBc) and smaller second harmonic content (by /spl sim/11 dBc) compared with n-p-n HBTs alone. While the second harmonics were shown to combine destructively in the push-pull amplifier, total cancellation of the second harmonic was prevented by the wide difference in linearity characteristics of the n-p-n and p-n-p HBTs. In addition, the circuit produced over 2 dBm more output power than the n-p n HBT alone at 1 dB of gain compression.

❑ Return to main document.