Abstracts

42% high-efficiency two-stage HBT power-amplifier MMIC for W-CDMA cellular phone systems (Dec. 2000 [T-MTT])

T. Iwai, K. Kebayashi, Y. Nakasha, T. Miyashita, S. Ohara and K. Joshin. "42% high-efficiency two-stage HBT power-amplifier MMIC for W-CDMA cellular phone systems (Dec. 2000 [T-MTT])." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2567-2572.

This is the first paper to report on a high-efficiency two-stage heterojunction-bipolar-transistor power-amplifier monolithic microwave integrated circuit (MMIC) for 1.95-GHz wide-band code-division multiple-access (W-CDMA) cellular phone systems. Power amplifiers for W-CDMA systems are required to operate at high efficiency and high linearity over a wide range of output power levels. To obtain high efficiency at low output power (P/sub out/) as well as at the required maximum P/sub out/ and obtain a high linearity at the maximum P/sub out/, we chose near-class-B operation. To improve linearity at a medium P/sub out/ range, we suppressed the gain distortion resulting from near-class-B operation by using an adaptive biasing technique. The MMIC exhibited a power-added efficiency of 42%, the highest ever reported, a gain of 30.5 dB, and an adjacent channel leakage power ratio at a 5-MHz offset frequency of -38 dBc at a P/sub out/ of 27 dBm under a supply voltage of 3.5 V with 3.84-Mcps hybrid phase-shift keying modulation.

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