Abstracts

Ultra-Low dc Power GaAs HBT S- and C-Band Low Noise Amplifiers for Portable Wireless Applications

K.W. Kobayashi, A.K. Oki, L.T. Tran and D.C. Streit. "Ultra-Low dc Power GaAs HBT S- and C-Band Low Noise Amplifiers for Portable Wireless Applications." 1995 Transactions on Microwave Theory and Techniques 43.12 (Dec. 1995, Part II [T-MTT] (1995 Symposium Issue)): 3054-3060.

We report on a 2.1 mW low dc power GaAs HBT LNA with 2.0 dB noise figure and 8.9 dB gain at 2 GHz. This amplifier achieves a Gain/NF · P/sub pc/ ratio figure of merit of 2.10 (1/mW) which is the highest reported at S-band. Under low dc power bias of 2 V and 0.46 mA (0.92 mW), the amplifier achieves 5.2 dB gain, 3.01 dB noise figure and a Gain/P/sub dc/ figure of merit of 5.65 (dB/mW) which is also the highest reported in this frequency band. In addition, a 2-stage self-biased C-band LNA which achieves a minimum noise figure of 2.4 dB at 5 GHz, 16.2 dB gain, with only 72 mW of dc power was also demonstrated. This is believed to be the lowest noise figure performance so far reported for an HBT amplifier above 3 GHz. Both HBT LNA's are fabricated using a relaxed 3 µm emitter width low cost GaAs production foundry process. The high performance obtained from HBT's at very low dc bias makes them attractive for portable wireless applications in the Industrial-Scientific-Medical (ISM) frequency bands.

❑ Return to main document.