Abstracts

InP Based HBT Millimeter-Wave Circuit Performance to Technology and 40 GHz

K.W. Kobayashi, L.T. Tran, S. Bui, J. Velebir, D. Nguyen, A.K. Oki and D.C. Streit. "InP Based HBT Millimeter-Wave Circuit Performance to Technology and 40 GHz." 1993 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 93.1 (1993 [MCS]): 85-88.

We report the first lnP based HBT millimeter-wave amplifiers and oscillators designed in a microstrip environment and working up to 40 GHz. A 20-40 GHz balanced high intercept amplifier and a 30 GHz VCO have been successfully fabricated and tested. These circuits benchmark the first Inp HBT microstrip designs at Ka-band frequencies. The high intercept amplifier achieves a gain of 5 dB and an IP3 of 20 dBm at 35 GHz. The monolithic VCO uses a base emitter varactor diode to tune as high as 9% bandwidth from a nominal oscillation frequency of 30 GHz. The ouput power is invariant of VCO tuning and is about +9.9 dBm ± 0.5 dBm. The collector efficiency is 21%. The total power dissipation is 77 mW. These circuit demonstrations show great potential for HBTs in millimeter-wave communication systems.

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