Abstracts

A 44 GHz InP-based HBT double-balanced amplifier with novel current re-use biasing (1998 Vol. I [MWSYM])

K.W. Kobayashi, M. Nishimoto, L.T. Tran, H. Wang, J. Cowles, T.R. Block, J. Elliott, B. Allen, A.K. Oki and D.C. Streit. *"A 44 GHz InP-based HBT double-balanced amplifier with novel current re-use biasing (1998 Vol. I [MWSYM])." 1998 MTT-S International Microwave Symposium Digest 98.1 (1998 Vol. I [MWSYM]): 211-214.*

Here we report on what is believed to be the first Q-band IP3 results of an InAlAs/InGaAs-InP based HBT MMIC linear amplifier. The 3-stage amplifier uniquely combines a "double-balanced" design topology that incorporates a "current re-use" bias scheme. The amplifier MMIC achieves 15.4 dB of gain, 28.3 dBm of IP3, and a P/sub sat/ of 16.2 dBm at 44 GHz. The corresponding output-stage IP3/P/sub dc/ ratio is 5.3 which is the best reported for InP-HBTs at Q-band. The MMIC is a high complexity chip which integrates 15 HBTs and 18 Lange couplers in a 6.2/spl times/3.5 mm/sup 2/ area, and is self-biased through 5 V while consuming 108 mA. The "current re-use" enables easier system integration while the "double-balanced" design produces wideband IP3, gain and return-loss performance. This work demonstrates the promising linearity performance of InP-HBTs and its practical biasing capability which is attractive for Q-band receiver applications such as mm-wave digital radio.

❑ Return to main document.