Abstracts

The voltage-dependent IP3 performance of a 35-GHz InAlAs/InGaAs-InP HBT amplifier

K.W. Kobayashi, A.K. Oki, J. Cowles, L.T. Tran, P.C. Grossman, T.R. Block and D.C. Streit. "The voltage-dependent IP3 performance of a 35-GHz InAlAs/InGaAs-InP HBT amplifier." 1997 Microwave and Guided Wave Letters 7.3 (Mar. 1997 [MGWL]): 66-68.

Here we report on the first IP3 results of a 35-GHz Ka-band amplifier based on InAlAs/InGaAs-InP heterofunction bipolar transistors (HBT's). The amplifier combines four 1/spl times/10 /spl mu/m/sup 2/ quad-emitter HBT devices for a total emitter area of 160 /spl mu/m/sup 2/ to achieve a gain of 5 dB and an IP3 of 26.5 dBm at 35 GHz. IP3 was characterized over collector bias voltage and indicates that there is an optimum V/sub ce/, corresponding to a maximum IP3 to DC power ratio, which is related to the HBT nonlinear voltage-dependent collector-base capacitance. A maximum IP3-to-DC power linearity figure of merit (LFOM) of 4.1 is achieved at a total collector current of 48 mA and a low V/sub ce/ of 2.25 V, This LFOM is comparable to HEMT's at these frequencies and is expected to improve with the maturity of InAlAs/InGaAs-InP HBT technology.

❑ Return to main document.