Abstracts

A Q-Band Monolithic Linear Amplifier Using AlGaAs/GaAs HBT's

Y. Kwon, W.-J. Ho and J.A. Higgins. "A Q-Band Monolithic Linear Amplifier Using AlGaAs/GaAs HBT's." 1996 Microwave and Guided Wave Letters 6.4 (Apr. 1996 [MGWL]): 180-182.

This letter reports on a Q-band monolithic hetero-junction bipolar transistor (HBT) amplifier demonstrating high gain, efficiency, excellent linearity, and low added phase noise. The amplifier used 40 μm² CB-HBT's in a balanced configuration. The monolithic microwave integrated circuit (MMIC) amplifier showed a peak gain of 13.5 dB at 38 GHz and a 3-dB bandwidth of 10 GHz. Under class-A bias conditions, the circuit exhibited P/sub 1 dB/ higher than 15 dBm from 35--41.5 GHz and a peak PAE of 32% at 35 GHz. Two-tone tests showed an IP/sub 3/ of 30 dBm at 44 GHz and IMD/sub 3/ ratios better than 20 dBc at 1-dB gain compression point. Amplifier phase noise measurement showed added phase noise of -148 dBc/Hz at 10 kHz away from the carrier at P/sub 1dB. This circuit demonstrates a great potential for the HBT MMIC's for mm-wave high-efficiency linear applications.

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