Abstracts

A 3-10-GHz GaN-based flip-chip integrated broad-band power amplifier

J.J. Xu, S. Keller, G. Parish, S. Heikman, U.K. Mishra and R.A. York. "A 3-10-GHz GaN-based flip-chip integrated broad-band power amplifier." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2573-2578.

In this paper, we report the latest progress of a GaN-based broad-band power amplifier using AlGaN/GaN high electron mobility transistors (HEMTs), grown on sapphire substrates, as the active devices. The devices were flip-chip integrated onto the aluminum nitride circuit board for thermal management and electric connection. The circuit topology used novel LCR-matching networks in a four-way binary-Wilkinson combiner structure. Using devices with 0.7-/spl mu/m gate length and 4-mm gate width, a small-signal gain of 7 dB was obtained with 3-10-GHz bandwidth. Output power of 8 W (continuous wave) at 9.5 GHz with about 20% power-added efficiency was achieved when biased at 24 V, which is the highest output power for a power amplifier using GaN-HEMTs-on-sapphire.

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