Abstracts

1-8-GHz GaN-based power amplifier using flip-chip bonding

J.J. Xu, Yi-Feng Wu, S. Keller, S. Heikman, B.J. Thibeault, U.K. Mishra and R.A. York. "1-8-GHz GaN-based power amplifier using flip-chip bonding." 1999 Microwave and Guided Wave Letters 9.7 (Jul. 1999 [MGWL]): 277-279.

We report the first gallium nitride (GaN)-based broad-band power amplifier. The circuit was fabricated on an AlN substrate using AlGaN-GaN power high-electron mobility transistors (HEMTs), grown on sapphire substrates, which were flip-chip bonded for thermal management. The amplifier employed a modified traveling-wave power amplifier (TWPA) topology that eliminated the backward wave of conventional TWPAs. Using four HEMTs each with 0.75-/spl mu/m gate length and 0.75-mm gate periphery, a small-signal gain of /spl sim/7 dB was obtained with a bandwidth of 1-8 GHz. At mid-band, an output power of 3.6 W was obtained when biased at V/sub ds/=18 V and 4.5 W when biased at V/sub ds/=22 V.

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