Abstracts

Ka-band high-power and driver MMIC amplifiers using GaAs PHEMTs and coplanar waveguides

A. Bessemoulin, H. Massler, A. Hulsmann and M. Schlechtweg. "Ka-band high-power and driver MMIC amplifiers using GaAs PHEMTs and coplanar waveguides." 2000 Microwave and Guided Wave Letters 10.12 (Dec. 2000 [MGWL]): 534-536.

We report the design and fabrication of compact 2- and 3-stage coplanar (CPW) microwave monolithic integrated circuit (MMIC) amplifiers having high output power at Ka-band. Based on a 0.15-/spl mu/m gate length GaAs PHEMT process, a two-stage MMIC driver amplifier has demonstrated at 35 GHz, a linear gain of 11 dB, an output power at 1 dB gain compression P/sub -1 dB/ of 350 mW, and a saturated output power P/sub sat/ greater than 500 mW. For the same frequency, the high-power CPW 2-stage amplifier achieved a linear gain of 9.5 dB, with P/sub -1 dB/=725 mW and more than 1 W of saturated output power, Additional thermal management resulted in an increased performance, namely, 10.4 dB linear gain, P/sub -1 dB/=950 mW and P/sub sat/=1.2 W. To our knowledge, these are the highest output powers ever reported at Ka-band for any uniplanar MMIC.

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