Abstracts

A 6 watt Ka-band MMIC power module using MMIC power amplifiers (1997 Vol. I [MWSYM])

D.L. Ingram, D.I. Stones, T.W. Huang, M. Nishimoto, H. Wang, M. Siddiqui, D. Tamura, J. Elliott, R. Lai, M. Biedenbender, H.C. Yen and B. Allen. "A 6 watt Ka-band MMIC power module using MMIC power amplifiers (1997 Vol. I [MWSYM])." 1997 MTT-S International Microwave Symposium Digest 1. (1997 Vol. I [MWSYM]): 1183-1186.

In this paper we present the development of a 6 Watt 24% PAE Ka-band power module with an associated power gain of 21.5 dB. The power module consists of a driver amplifier and two power amplifier chips. These MMIC amplifiers were fabricated with a 2-mil thick substrate using 0.15-/spl mu/m InGaAs/AlGaAs/GaAs HEMT technology. The driver amplifier is a fully matched single-ended design with an output power of 27.5 dBm, a 10.7 dB power gain and 27% PAE. We use a hybrid approach for the output power amplifier which consists of two partially-matched MMIC chips and a 8-way Wilkinson combiner fabricated on alumina substrate. The MMIC power amplifiers delivered a record power of 35.4 dBm (3.5 W) with a PAE of 28% and an associated power gain of 11.5 dB. The 8-way combiner has an insertion loss of 0.6 dB. We believe this is a new benchmark for power module using monolithic approach at this frequency range.

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