Abstracts

Four-Watt, Kt-Band MMIC Amplifier

R. Yarborough, D. Heston, P. Saunier, H.Q. Tserng, K. Salzman and B. Smith. "Four-Watt, Kt-Band MMIC Amplifier." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 797-800.

The 4-watt, 28-percent-efficient, 20-GHz power amplifier results reported at last year's symposium have been significantly improved to 4 watts and 38-percent efficiency by using 0.25-µm pHEMT device technology. The 1992 paper reported amplifier results for our 0.25-µm HFET technology. In 1993, the amplifier was minimally redesigned to accommodate our latest pHEMT device improvements. The results, reported here are for a packaged Kt-band amplifier, include connector losses (no de-embedding), and are the best power and efficiency numbers reported to date for this frequency. The gain and bandwidth of this two-stage amplifier have also increased with the improved device technology, by 4.5- to 13.5-dB power gain across the 17.5- to 21-GHz band. The Kt-band amplifier features a mostly monolithic approach, with a portion of the input- and output-matching networks on alumina. AM/PM measurements for this amplifier demonstrate capability for transmitting QPSK information. This paper presents discrete 0.25-µm pHEMT device results at 18 and 20 GHz, as well as amplifier design and performance over a >3-GHz band.

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