Abstracts

Compact W-band solid-state MMIC high power sources

D.L. Ingram, Y.C. Chen, I. Stones, D. Yamauchi, B. Brunner, P. Huang, M. Biedenbender, J. Ellion, R. Lai, D.C. Streit, K.F. Lau and H.C. Yen. "Compact W-band solid-state MMIC high power sources." 2000 MTT-S International Microwave Symposium Digest 00.2 (2000 Vol. II [MWSYM]): 955-958.

Presented is the development of two >2 W W-band solid-state monolithic microwave integrated circuit (MMIC) power amplifier modules using TRW's advanced GaAs- and InP-based HEMT MMICs. The GaAs HEMT at version delivers a record power of 2.4 W at 8.2% power-added efficiency with an associated gain of 12 dB at CW condition. The InP HEMT version delivers a compatible power of 2.24 W at 9.9% PAE with much higher associated gain of 19.5 dB. These are the highest recorded W-band power module using solid-state MMIC technology. The measured results clearly show that InP HEMT technology, though operating at a lower drain voltage (2.5-3 V) than GaAs HEMT device (typically 3.5-4 V), offers a better power-efficiency combination at much higher associated gain than its GaAs counterpart at millimeter-wave frequency. The overall module only weighs 10 oz. in a volume of <4 in/sup 3/. This is the smallest 2.4-watt W-band highpower module to date.

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