Abstracts

The Potential of InP IMPATT Diodes as High-Power Millimeter-Wave Sources: First Experimental Results

H. Eisele, C.-C. Chen, G.O. Munns and G.I. Haddad. "The Potential of InP IMPATT Diodes as High-Power Millimeter-Wave Sources: First Experimental Results." 1996 MTT-S International Microwave Symposium Digest 96.2 (1996 Vol. II [MWSYM]): 529-532.

Extensive simulations of GaAs and InP transit-time diodes clearly show the advantages of the InP material system. RF power levels of more than 1 W as well as dc-to-RF conversion efficiencies of more than 18 % around 100 GHz can be expected from optimized diodes. The fabrication process was adopted from the process for InP Gunn devices on integral heat sinks. Typical RF power levels were around 80 mW from about 60 GHz to 80 GHz with corresponding dc-to-RF conversion efficiencies ranging from 3 % to 4 %. The best device yielded more than 110 mW (more than 5 %) at 64.7GHz, 82 mW (3.7 %) at 79 GHz and 55 mW (2.4 %) at 84.8 GHz. These preliminary experimental results are better than those of single-drift flat-profile GaAs IMPATT diodes on integral heat sinks and also indicate the strong potential for millimeter-wave InP IMPATT diodes.

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