Abstracts

A 10-Watt X-Band Grid Oscillator

J.B. Hacker, M.P. De Lisio, M. Kim, C.-M. Liu, S.-J. Li, S.W. Wedge and D.B. Rutledge. "A 10-Watt X-Band Grid Oscillator." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 823-826.

A 100-transistor MESFET grid oscillator has been fabricated that generates an effective radiated power of 660 W at 9.8 GHz and has a directivity of 18.0 dB. This corresponds to a total radiated power of 10.3 W, or 103 mW per device. This is the largest recorded output power for a grid oscillator. The grid drain-source bias voltage is 7.4 V and the total drain current for the grid is 6.0 A, resulting in an overall dc-to -rf efficiency of 23%. The pattern of the SSB noise-to-carrier ratio was measured and found to be essentially independent of the radiation angle. The average SSB noise level was -87 dBc/Hz at an offset of 150 kHz from the carrier. An average improvement in the SSB noise-to-carrier ratio of 5 dB was measured for a 100-transistor grid compared to a 16-transistor grid.

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