Abstracts

Bar-Grid Oscillators

Z.B. Popovic, R.M. Weikle, II, M. Kim, K.A. Potter and D.B. Rutledge. "Bar-Grid Oscillators." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 225-230.

Grid oscillators are an attractive way of obtaining high power levels from solid-state devices, since potentially the output powers of thousands of individual devices can be combined. The active devices do not require an external locking signal and the power combining is done in free space. In this work 36 transistors are mounted on parallel brass bars, which provide a stable bias and have a low thermal resistance. The output power degrades gradually when devices fail. The grid gives an effective radiated power (ERP) of 3 W at 3 GHz. The directivity is 11.3 dB and the dc to RF efficiency is 22 percent. Modulation capabilities of the grid are demonstrated. An equivalent circuit model for the grid is derived, and comparison with experimental results is shown.

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