Abstracts

A Multiple-Device Cavity Oscillator Using Both Magnetic and Electric Coupling Mechanisms

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This paper presents a novel concept to increase the number of active devices combined in a cavity oscillator by coupling them to both electric and magnetic fields inside the cavity. The structure employs probes and coaxial lines for electric and magnetic coupling, respectively. The sum of the output powers from individual devices combined can be obtained by properly adjusting the coupling factors of the circuit. Operation principles of the circuit are analyzed for probe coupling, and results are applied to explain the operation of the circuit when both probe and coaxial coupling are used. The circuits described here are free from moding instabilities. Prototype circuits have been constructed at X-band, using Gunn diodes, for experimental confirmation of the theory developed.

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