Abstracts

Optimum Design and Performance of a Microwave Ladder Oscillator with Many Diode Mount Pairs

This paper presents a detailed discussion on the optimum design of a microwave ladder oscillator which is essentially an array of modules having a pair of diode mounts placed symmetrically with the waveguide-axis. A quantitative description of the power-combining mechanism for optimum operation is also given. The validity of the optimum design formula is confirmed by experiments on X-band oscillators with as many as twenty Gunn diodes, for which combining efficiency greater than 92 percent was obtained. Neither undesired single-mode nor simultaneous multimode oscillations were observed in the vicinity of the optimum circuit condition, this was supported by mode-analytical discussion. A ladder structure with equally spaced diode mount pairs is also treated because of its practical importance, shown by theory, experiment to yield good combining efficiency.

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