Abstracts

Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures

S. Tanaka, S. Nogi, K. Fukui and Y.-A. In. "Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1755-1760.

Power combining in oversized cylindrical cavities has hiterto not given successful results. The purpose of this paper is to show both analytically and experimentally that the combining efficiency in such cavities can be remarkably improved by finding the optimum position and number of devices. An "equivalent loss resistance," which indicates the cavity loss per device when every device generates its available power, is introduced, and the number and position of devices which minimize the quantity is obtained for a TM/sub 0n0/-mode cavity by carrying out FEM field analysis. Power-combining experiments using TM/sub 020/- and TM/sub 030/-mode cavities confirmed the theory and achieved excellent power-combining efficiencies of, respectively, 117 percent and 107 percent in the TM/sub 020/-mode cavity with ten devices and in the TM/sub 030/-mode one with 12 devices.

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