Abstracts

Spatial power combining for two-dimensional structures

C.W. Hicks, Huan-Sheng Hwang, M.B. Steer, J.W. Mink and J.F. Harvey. "Spatial power combining for two-dimensional structures." 1998 Transactions on Microwave Theory and Techniques 46.6 (Jun. 1998 [T-MTT]): 784-791.

The two-dimensional (2-D) hybrid dielectric slab-beam open and closed waveguide systems are suitable for the design of planar quasi-optical integrated circuits and devices. An open system consisting of an active E-plane amplifier array consisting of Vivaldi-type antennas with MESFET and monolithic microwave integrated circuit (MMIC) devices was investigated. The 4/spl times/1 MESFET amplifier array generated 11 and 4.5 dB of amplifier and system gain, respectively, at 7.12 GHz, and the cascade MMTC Vivaldi-type antenna produced 24 dB of amplifier gain at 8.4 GHz. Also, experiments on a new 2-D H-plane parallel-plate closed system with a stripline slot antenna is introduced, and the wavebeam-mode theory is presented. The new system minimizes scattering and isolation losses associated with open structures. The amplifier gain of the closed system based on slot antennas is compared to the open system based on Vivaldi antennas.

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