Abstracts

The application of photonic crystals to quasi-optic amplifiers

J.A. Higgins, M. Kim, J.B. Hacker and D. Sievenpiper. "The application of photonic crystals to quasi-optic amplifiers." 1999 Transactions on Microwave Theory and Techniques 47.11 (Nov. 1999 [T-MTT] (Mini-Special Issue on Electromagnetic Crystal Structures, Design, Synthesis, and Applications)): 2139-2143.

Quasi-optical spatial power combining provides the high combining efficiency required of solid-state power amplifiers for millimeter-wave frequencies. Photonic crystals (PXTs) are used to implement this type of power combining, as shown by two examples in this paper. The first example describes an all-dielectric structure that provides a carrier for the amplifier array chip satisfying the requirements concerning unilateral transmission and thermal management. The second example describes the use of a high impedance ground plane, based on PXTs, to make the power density incident on the array chip as uniform as possible in order to maximize power and efficiency.

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