Abstracts

A circuit-fed tile-approach configuration for millimeter-wave spatial power combining

M.A. Gouker, J.T. Delisle and S.M. Duffy. "A circuit-fed tile-approach configuration for millimeter-wave spatial power combining." 2002 Transactions on Microwave Theory and Techniques 50.1 (Jan. 2002, Part I [T-MTT] (Mini-Special Issue on 1999 International Microwave and Optoelectronics Conference (IMOC'99))): 17-21.

In this paper, a circuit-fed spatially combined transmitter array is described for operation at 44 GHz. The array contains 256 elements where each element consists of a monolithic-microwave integrated-circuit amplifier and a circularly polarized microstrip patch antenna. The array is constructed using 16-element tile-approach subarrays. Each subarray is a two RF-level (three-dimensional) multichip module containing integrated microstrip patch antennas. The basic construction of the transmitter array resembles tile-approach phased arrays; however, the implementation has been tailored for the power-combining application. The peak performance at 43.5 GHz is equivalent isotropic radiated power of 40.6 dBW (11570 W), effective transmitted power (P/sub eff/) of 5.9 W, dc-to-RF efficiency of 7.3%, and system gain of 35 dB.

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