Abstracts

A 120-W X-band spatially combined solid-state amplifier

Nai-Shuo Cheng, Pengcheng Jia, D.B. Rensch and R.A. York. "A 120-W X-band spatially combined solid-state amplifier." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2557-2561.

In this paper, we present new results in the development of a broad-band spatial power-combining system implemented in a standard X-band waveguide environment. Using 24 off-the-shelf GaAs monolithic-microwave integrated-circuit (MMIC) power amplifiers integrated with tapered-slot antenna arrays, the new combining circuit produced up to 126-W maximum power output with a gain variation of /spl plusmn/1.9 dB within the band of interest (8-11 GHz). This hybrid circuit combiner is transparent to the device technology, and also provides an excellent heat-sinking capacity, sustaining as much as 415 W of dc power consumed by the MMIC amplifiers. The modular architecture allows easy maintenance, variable output power level, and modular assembly. Results on graceful degradation are also presented, showing superb tolerance to device failure.

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