Abstracts

Two-Level Power Combining Using a Lens Amplifier

J.S.H. Schoenberg, S.C. Bundy and Z.B. Popovic. "Two-Level Power Combining Using a Lens Amplifier." 1994 Transactions on Microwave Theory and Techniques 42.12 (Dec. 1994, Part II [T-MTT] (1994 Symposium Issue)): 2480-2485.

A two-level quasi-optical power combiner is presented. The combiner consists of a grid oscillator which feeds a transmission amplifier at its focal point. The focal-point feed improves power coupling efficiency over that of a plane-wave feed. A linear 7-element lens amplifier array demonstrates 29 dB of isolation and a 30° continuous scan angle with less than 1 dB power variation at 9.7 GHz. A 24-element two-dimensional lens amplifier array fed by a grid oscillator demonstrates 5.7 dB gain and a 30° scan angle with less than 2dB power variation at 10.25 GHz, When horn-fed, the 24-element lens has an isolation of 17-21 dB over a 3% bandwidth. The grid oscillator, as well as receive and transmit sections of the lens amplifiers, are each fabricated on single substrates, making monolithic millimeter-wave integration of each component possible.

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