Abstracts

Quasi-Optical Planar Arrays with FET's and Slots

S. Kawasaki and T. Itoh. "Quasi-Optical Planar Arrays with FET's and Slots." 1993 Transactions on Microwave Theory and Techniques 41.9 (Oct. 1993 [T-MTT] (Special Issue on Quasi-Optical Techniques)): 1838-1844.

This paper describes the design concept and the experimental results of prototypes of two-dimensional quasi-optical power combining arrays. Several different quasi-optical circuits were made to obtain the fundamental data for this study. How to incorporate the antenna input impedance into the active antenna circuit and how to analyze the strong coupling condition with two operation modes are addressed by using a large signal analysis. Several configurations of the circuits are demonstrated, such as a single active antenna operating at 9.3 GHz and 24.0 GHz, a 6-element linear power combining array operating at 15.6 GHz and 4-element and 16-element two-dimensional power combining arrays operating at 10.4 GHz and 7.8 GHz. Important characteristics such as antenna patterns and tuning ranges are discussed. Finally, the prospects for a two-dimensional monolithic quasi-optical power combining array are discussed.

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