Abstracts

New Synthesis Method for a Branch-Line 3 dB Hybrid: A Hybrid Approach Comprising Planar and Transmission Line Circuit Concepts

T. Anada, J.-P. Hsu and T. Okoshi. "New Synthesis Method for a Branch-Line 3 dB Hybrid: A Hybrid Approach Comprising Planar and Transmission Line Circuit Concepts." 1991 Transactions on Microwave Theory and Techniques 39.6 (Jun. 1991 [T-MTT]): 969-976.

This paper presents a new synthesis method for a stripline-type branch-line 3 dB hybrid based on an equivalent circuit derived by the planar circuit approach. The equivalent circuit of an ideal 3 dB hybrid is derived first from those of the segmented circuit elements, i.e., four three-port junctions and four quarter-wave transmission lines. A systematic synthesis process is then developed upon the basis of the equivalent circuit. Practical hybrid circuits having optimized circuit patterns were constructed for center frequencies of 3, 5, and 7 GHz, and their characteristics were measured. The results agree well with the theory, demonstrating the validity and effectiveness of the proposed synthesis method.

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