Abstracts

Microstrip Spiral Directional Coupler

K. Shibata, K. Hatori, Y. Tokumitsu and H. Komizo. "Microstrip Spiral Directional Coupler." 1981 Transactions on Microwave Theory and Techniques 29.7 (Jul. 1981 [T-MTT]): 680-689.

A new microwave directional coupler with a spiral-shaped construction is described. This coupler is named the spiral coupler and is formed by coiling two edge-coupled lines. Therefore, the size of the coupler can be greatly miniaturized. Furthermore, this coupler can achieve tight coupling much easier than the conventional coupler with edge-coupled lines on account of the multiconductor structure. The spiral couplers with a total length of a quarter-wave were fabricated on alumina ceramic substrates and resulted in 3.5-dB maximum conpling for a 40-µm strip spacing. The size of the coupler was about one-sixth of the conventional one. The spiral coupler with a total length of three quarter-waves theoretically showed 2.5-dB coupling for a 95-µm strip spacing on an alumina substrate. The achieved coupling is due to the skillful construction of the spiral. An experimental coupler fabricated on a Teflon substrate confirmed the usefulness of this approach.

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