Abstracts

Multilayer MMIC Directional Couplers Using Thin Dielectric Layers

S. Banba and H. Ogawa. "Multilayer MMIC Directional Couplers Using Thin Dielectric Layers." 1995 Transactions on Microwave Theory and Techniques 43.6 (Jun. 1995 [T-MTT]): 1270-1275.

Low-loss and small-sized MMIC directional couplers utilizing a multilayer structure composed of coupled thin-film transmission lines on a GaAs wafer surface are newly proposed. The fundamental characteristics of the couplers are discussed through calculations by numerical analysis, and the performance of the couplers and an application to reverse-phase hybrid ring are demonstrated. The results show that a 3 dB coupler can be designed within a 0.8 mm x 0.8 mm area for a center frequency of 20 GHz. Coupling losses of 3.7 dB ± 0.2 dB over a 4-GHz bandwidth and isolation of better than 26 dB in the frequency range of 0-30 GHz are achieved. The proposed coupler configurations can be applied to the high-density and multifunction integration of MMIC's.

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