Abstracts

Microstrip Hybrid Couplers and Their Integration Into Balanced Mixers at X and K-Bands

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A number of 3 db couplers have been designed for microstrip transmission lines utilizing materials with dielectric constants between 9 and 11 for integration with other microstrip elements to form balanced mixers, power dividers, phase shifters, etc. Two- and three-arm branch-line couplers and the T.E.M. back coupler have been developed on alumina, gallium arsenide and sapphire between 8-18 GHz/s. For initial evaluation, the couplers were fabricated on small area substrates and housed in metal boxes to minimize the possibility of mode conversion and loss by radiation. Microstrip line lengths external to the couplers were quite small and measured loss values were primarily due to path lengths within the coupler. Measurements were made with coaxial equipment after matching the junction discontinuity that normally occurs between coaxial and microstrip lines.

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