Abstracts

Coupled-Transmission-Line Directional Couplers

J.K. Shimizu and E.M.T. Jones. "Coupled-Transmission-Line Directional Couplers." 1958 Transactions on Microwave Theory and Techniques 6.4 (Oct. 1958 [T-MTT]): 403-410.

Formulas are presented for the design of coupled-transmission-line directional couplers that are rigorous for any value of coupling. Two basic types are treated in detail; the simplest is one-quarter wavelength long at the center of its frequency band, while the other is three-quarter wavelength long. The quarter-wavelength type can be used over an octave of frequencies with approximately consistant coupling, while the three-quarter-wavelength type can be used equally well over more than two two octaves. For example, a -3-db coupler of the first type has a variation of ±0.3 db over a 2:1 band, while the second type has the same variation over a 4.5:1 band. Theoretically both types should have infinite directivity at all frequencies. The experimental results for models of these directional couplers have been found to conform very closely to the theoretical coupling functions, while the directivity, although usually good, is limited by discontinuity effects and constructional tolerances.

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