Abstracts

Coupled-Transmission-Line Directional Couplers with Coupled Lines of Unequal Characteristic Impedances (Jul. 1966 [T-MTT])

E.G. Cristal. "Coupled-Transmission-Line Directional Couplers with Coupled Lines of Unequal Characteristic Impedances (Jul. 1966 [T-MTT])." 1966 Transactions on Microwave Theory and Techniques 14.7 (Jul. 1966 [T-MTT]): 337-346.

A new class of coupled-transmission-line directional couplers, called "nonsymmetrical directional couplers," is described. Unlike conventional directional couplers, nonsymmetrical directional couplers use coupled lines of unequal characteristic impedances. The principal difference between the performance of nonsymmetrical directional couplers and that of conventional designs is the impedance level of the coupled waves, which may be changed to higher or lower impedance levels than that of the incident wave. These directional couplers may be designed to have infinite directivity and to be matched at all frequencies, or they may be designed to have infinite directivity at all frequencies and a specified maximum VSWR. Coupling relationships and design equations for both cases are presented, and the relative properties of both cases are discussed. The theoretical limitation on the maximum coupling and the maximum impedance transformation that can be obtained simultaneously are derived. Techniques for broadbanding by cascading additional sections of coupled limes are described. Experimental results of a trial -- 10-dB coupler with coupled lines of 50 and 75 ohms are presented.

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