Abstracts

On a Class of Multiple-Line Directional Couplers

C.R. Boyd, Jr.. "On a Class of Multiple-Line Directional Couplers." 1962 Transactions on Microwave Theory and Techniques 10.4 (Jul. 1962 [T-MTT]): 287-294.

Multiple-line directional couplers that utilize only two linearly independent modes of propagation are possible, provided certain restrictions on the maximum coupling are not exceeded. This paper discusses a class of multiple-line directional couplers which may be considered as a generalization of the familiar double-stub four-port directional coupler. The basic design relations for the symmetrical case are developed, and frequency behavior is investigated. Experimental results for an L-band six-port hybrid junction are presented and compared with theoretical curves. Limitations on maximum coupling and fabrication problems will probably confine the number of lines in practical circuits to a small value. Bandwidths of couplers of this class tend to become narrower for the same total coupling off the main line as the number of lines is increased; however, standard techniques for broadbanding are applicable. Experimental results on the six-port hybrid junction agreed well with theory, and the circuit proved to be relatively compact.

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