Abstracts

Synthesis and Design of Wide-Band Equal-Ripple TEM Directional Couplers and Fixed Phase Shifters

J.P. Shelton and J.A. Mosko. "Synthesis and Design of Wide-Band Equal-Ripple TEM Directional Couplers and Fixed Phase Shifters." 1966 Transactions on Microwave Theory and Techniques 14.10 (Oct. 1966 [T-MTT]): 462-473.

An approximate synthesis technique is described for TEM directional couplers and fixed phase shifters consisting of multiple parallel-coupled quarter-wave sections. Synthesis is accomplished without the use of polynomials by a first-order relationship between the components and Chebyshev antenna arrays. The design procedure has the important advantage of allowing the maximum coupling coefficient between transmission lines to be an independent parameter. An iterative correction procedure for bringing the performance arbitrarily close to equal-ripple is described. The process has been programmed for electronic computation, and the results have been tabulated for directional couplers of 3, 6, 10, and 20 dB overall coupling and for phase shifters of 90, 45, and 22.5 degrees differential phase shifts. Bandwidth ratios range between 2 and 25, and the number of coupled sections ranges from 3 to 21 for couplers and from 2 to 9 sections for phase shifters. Maximum normalized even-mode impedance ranges from 1.83434 to 4.5.

❑ Return to main document.