Abstracts

Simplified Analysis of Coupled Transmission-Line Networks

R. Sato and E.G. Cristal. "Simplified Analysis of Coupled Transmission-Line Networks." 1970 Transactions on Microwave Theory and Techniques 18.3 (Mar. 1970 [T-MTT]): 122-131.

A relatively simple method is presented for analyzing coupled transmission-line networks by using network graphs and graph transformations. The network graph symbolism is easy to draw and to manipulate. All the graphs consist only of inductor, capacitor, and transformer symbols, and straight lines, which represent unit elements. The method of analysis is illustrated by several two-wire-line and multiwire-line examples. Also presented are several new useful transmission-line transformations and a graph equivalent for the general coupled transmission-line network. The graph-transformation method has four principal advantages: 1) explicit open-wire-line equivalent circuits of coupled line networks can be obtained relatively easily and without knowledge of network synthesis techniques; 2) the form of equivalent circuits can often be obtained without using any algebra; 3) at each step of the analysis, a positive-real network in graph form is available; consequently, in many analysis problems several equivalent circuits for the same network are derived; and 4) multiport networks are as easily dealt with as two-port networks.

❑ Return to main document.