Abstracts

The Transient Analysis of Certain TEM Mode Four-Port Networks

G.F. Ross. "The Transient Analysis of Certain TEM Mode Four-Port Networks." 1966 Transactions on Microwave Theory and Techniques 14.11 (Nov. 1966 [T-MTT]): 528-542.

This paper presents the transient analysis of certain four-port TEM mode microwave networks. Flow graph techniques are employed to determine in closed form the system function between two given ports. This representation reveals the pole-zero pattern of the component which is used to graphically obtain the amplitude spectrum (CW response). In the time domain, the impulse response (the inverse transform of the system function) is used to determine the step modulated response of the network at its resonant frequency. This proves to be a particularly easy task for certain symmetrical networks. The flow graph technique is illustrated by analyzing three often used microwave networks (namely; the ring hybrid, the 3-dB branch line coupler, and the branch line phase shifter), and an estimate is made of their "settling times" for a step modulated input. Experimental methods are introduced which permit an investigator to generate a 0.2 nanosecond pulse and/or a microwave step modulated source. These test functions are then used to critically evaluate the theoretical results in the laboratory.

❑ Return to main document.