Abstracts

On the definition of the generalized scattering matrix of a lossless multiport

A. Morini and T. Rozzi. "On the definition of the generalized scattering matrix of a lossless multiport." 2001 Transactions on Microwave Theory and Techniques 49.1 (Jan. 2001 [T-MTT] (Mini-Special Issue on 2000 Radio-Frequency Integrated Circuits (RFIC) Conference and Automatic Radio Frequency Techniques Group (ARFTG) Meeting)): 160-165.

In this paper, we reconsider the question of the definition of the generalized scattering matrix (GSM) of a lossless device, and show the conditions that the GSM must satisfy in order to correctly represent a lossless device, independently of the method used for its calculation. Moreover, starting from circuit theory, possible choices are considered, and among them the one is examined that seems to be the most meaningful when dealing with modes below cutoff. When the circuit is lossless, in fact, the resulting GSM is unitary, even when modes below cutoff are taken as accessible. This property provides an immediate check of the correctness of the computational implementation of actual problems. Finally, a practical example of the usefulness of the conditions provided is shown.

❑ Return to main document.