Abstracts

Dissipation and Scattering Matrices of Lossy Junctions (Short Papers)

J. Helszajn. "Dissipation and Scattering Matrices of Lossy Junctions (Short Papers)." 1972 Transactions on Microwave Theory and Techniques 20.11 (Nov. 1972 [T-MTT]): 779-782.

The purpose of this short paper is to construct the dissipation and scattering matrices of lossy junctions in terms of the eigenvalues of the dissipation matrix. This removes the need to rely on inequality relations between the scattering parameters of lossy circulators. The eigenvalues of the dissipation, scattering, and admittance matrices are related. The eigenvalues of the dissipation matrix give the dissipation associated with each possible way of exciting the junction. The ones of the scattering matrix give the reflection coefficients associated with these different excitations. The admittance eigenvalues define in each instance the eigennetworks of the junction. This leads to the definition of the entries of the dissipation matrix in terms of the loaded and unloaded Q-factors of the junction eigennetworks. The scattering matrices of a number of lossy 3-port junctions are also constructed directly in terms of the elements of the eigennetworks.

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