Abstracts

New Reciprocal Circuit Model for Lossy Waveguide Structures Based on the Orthogonality of the Eigenmodes

F. Olyslager, D. De Zutter and A.T. de Hoop. "New Reciprocal Circuit Model for Lossy Waveguide Structures Based on the Orthogonality of the Eigenmodes." 1994 Transactions on Microwave Theory and Techniques 42.12 (Dec. 1994, Part I [T-MTT]): 2261-2269.

In this contribution, we present a new consistent equivalent transmission line model to describe the propagation along lossy hybrid waveguide structures. All existing consistent transmission line models are based on the assumption that the power propagated by the modes considered in the waveguide is the same as the power propagated in the model. In a lossy reciprocal waveguide, this leads to a nonreciprocal transmission line model because the modes are not power orthogonal. We start from the Lorentz orthogonality condition to construct a reciprocal transmission line model, even for lossy waveguides. For multiconductor waveguides, we will discuss what we call RI- and RV-models, in analogy with the existing PI- and PV-models. We will also present a generalisation of these RI- and RV-models to general waveguide structures. The theory is illustrated with a comparison of an RI- and PI-model for a lossy thick microstrip structure.

❑ Return to main document.