Abstracts

Generalized Multiport Reciprocity Analysis of Surface-to-Surface Transitions Between Multiple Printed Transmission Lines

N.K. Das. "Generalized Multiport Reciprocity Analysis of Surface-to-Surface Transitions Between Multiple Printed Transmission Lines." 1993 Transactions on Microwave Theory and Techniques 41.6 (Jun./Jul. 1993 [T-MTT]): 1164-1177.

A new method of analysis of surface-to surface transitions between arbitrary combinations of multilayered printed transmission lines using a general multiport reciprocity formulation is presented. The scattering parameter at a given port of the transition is computed by directly relating it to simple reactions of the known eigenfields of the particular port on various induced strip currents or slot electric fields of other transmission lines. With simplifying practical assumptions in this general analysis, and by use of an efficient "singularity extraction technique," equivalent circuit models for particular cases are extracted with simple closed-form expressions for the equivalent circuit parameters. The multiport scattering matrix of the transition completely describes the coupling characteristics of the transition, and via standard network analysis can be conveniently used for design optimization of any port terminations and/or matching circuits. Detailed case studies of the general analysis include: 1) a single-layered microstrip line-to-slotline transition, 2) a microstrip-to-crossed covered microstrip transition, 3) a double microstrip line-to-slotline transition, and 4) a stripline-to-dual slotline transition.

❑ Return to main document.