Abstracts

Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities

A. Khebir, A.B. Kouki and R. Mittra. "Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1427-1432.

In this paper, the finite element method is used to analyze open region three-dimensional transmission line structures in the quasi-TEM regime. Starting with the general form of the solution to the three-dimensional Laplace's equation in spherical coordinates, a set of asymptotic boundary condition (ABC) operators is derived. Later, the second-order ABC is applied on a conformable outer boundary for the purpose of truncating the mesh in an efficient manner. To illustrate its application, the method is used to compute the capacitance of a rectangular microstrip path, and the results are found to be in good agreement with data published elsewhere.

❑ Return to main document.