Abstracts

Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors

I.-S. Tsai and C.H. Chen. "Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 754-759.

A novel perturbed-TEM approach is proposed to study the detailed current distribution and the propagation constant of a multi-conductor transmission line system with imperfect conductors. In this study, the perturbed fields are derived under the assumption that the fields outside the conductors are TEM waves of the corresponding lossless system and those inside the conductors satisfy the TM modal equations. These fields are then substituted into a perturbational formula to obtain the propagation constant of the lossy system. Presented as an example are the current distribution and the propagation constant of a lossy two-wire transmission line, which clearly illustrates the loss mechanism due to the skin effect and the proximity effect.

❑ Return to main document.