Abstracts

Full Wave Characterization of a through Hole via Using the Matrix-Penciled Moment Method

S.-G. Hsu and R.-B. Wu. "Full Wave Characterization of a through Hole via Using the Matrix-Penciled Moment Method." 1994 Transactions on Microwave Theory and Techniques 42.8 (Aug. 1994 [T-MTT]): 1540-1547.

A full wave analysis was presented in this paper for the propagation characteristics of a via which connects two semi-infinitely long transmission lines through a hole in a ground plane. The current distribution on the via and a section of transmission line became solved under the thin wire approximation by the moment method and the scattering parameters are extracted by the matrix pencil method. Numerical results were included to investigate the frequency dependent propagation characteristics for via structures with various geometrical parameters, e.g. the via height, wire diameter, and via hole radius. The radiation loss was shown from a comparison with the quasi-static model to become important if the via height is larger than one tenth of a wavelength. The radiation mechanism could be mainly attributed towards the associated wire antenna structure and, at rather high frequencies, towards the associated grounded via structure.

❑ Return to main document.