Abstracts

Analysis of Transmission Lines of Finite Thickness Above a Periodically Perforated Ground Plane at Oblique Orientations

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A general method is formulated for the analysis of signal lines of finite thickness in the presence of a periodically perforated ground plane. Utilizing the dyadic Green's functions, a set of electric and magnetic field integral equations (EFIE, MFIE) is established, which are then transformed into the spectral domain by the Fourier transform. Galerkin's method is used to solve the combined integral equations. The B-spline functions are chosen as basis functions to achieve a higher order of convergence. The dispersive characteristics of the transmission lines are studied and the characteristic impedance of the signal lines are evaluated by both the voltage-current definition and the power-current definition, with good consistency. The effect of signal locations versus apertures in the ground plane is discussed. Finally, measurements are conducted, and the results agreed very well with the theory.

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