Abstracts

Waves Guided by Conductive Strips Above a Periodically Perforated Ground Plane

B.J. Rubin and H.L. Bertoni. "Waves Guided by Conductive Strips Above a Periodically Perforated Ground Plane." 1983 Transactions on Microwave Theory and Techniques 31.7 (Jul. 1983 [T-MTT]): 541-549.

This paper considers the propagation of waves along an array of conductive strips situated above a periodically perforated conductive plane. Each conductor has zero thickness and finite sheet resistance, and the dielectric is homogeneous. The surface current density on the conductors is approximated by a finite number of current elements having rooftop spatial dependence. The transverse electric field is expressed in terms of the current, and the electric field boundary condition is satisfied in an integral sense over the conductors. This generates a matrix equation whose solution gives the dispersion curve relating the propagation constant to frequency, as well as the current distribution. The simulation results are used to obtain equivalent transmission-line parameters applicable to printed circuit boards found in high-performance computers. A characteristic impedance is defined and it is shown that, with proper interpretation, the uniform transmission-line equations for propagation constant and characteristic impedance apply to such computer packages. The coupling between adjacent strips is caculated, and the effect of finite resistivity discussed.

❑ Return to main document.