Abstracts

Transmission Theory of a Parallel-Two-Wire-Transmission-Line Covered with Three Layer Media

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A parallel-two-wire-transmission-line covered by a three layer media has particular transmission characteristics. It is expected that this type of line might therefore be applied to new microwave circuits and antennas. Such lines have been analyzed by solving Laplace equations as a two dimensional boundary value problem. However, at higher frequencies, it is not appropriate to explain these particular properties using the quasi-TEM mode analysis. Transmission theory for these lines has to be solved using a rigorous three dimensional analysis. In this paper, we describe a new three dimensional analysis technique that is used to obtain more accurate propagation constants by considering the E/sub z/, H/sub z/ components of the field. The assumed current distribution of the Parallel-two-wire-line system is Fourier expanded over the angular coordinate 0, and the boundary value problem is solved by hybrid modes are transmitted via this type of transmission system and that the propagation constant varies discontinuously at frequencies where the dipole mode can exist on the three layer dielectric media itself. Numerical results are presented and compared with experimental data.

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