Abstracts

Mutual Coupling Between Microstrips through a Printed Aperture of Arbitrary Shape in Multilayered Media

A concise formulation of mixed-potential integral equation (MPIE) is developed to account for the mutual coupling effects between electric and magnetic current sources in a multi-layered medium. Unlike the electric field integral equation (EFIE) or magnetic field integral equation (MFIE), this expression only requires the less singular vector potential to evaluate the mutual impedance integral. As a result, computational speed and accuracy are enhanced. In addition, this formulation provides a physical insight of how this mutual coupling occurs, Although the odd symmetry of the impedance matrix concluded from reciprocity theorem is not obvious, it is numerically evaluated and justified. Finally, a vertical transition between back-to-back microstrip lines is calculated and compared with published data. Bandwidth improvement of this transition is also demonstrated by introducing a bowtie slot for the vertical coupling.

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