Abstracts

Complex Modes in Shielded Planar Microstrip Lines

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This paper analyzes the existence of complex modes, which have important effects on the properties of planar transmission line discontinuities, in electrically shielded microstrip lines. A rigorous full-wave spectral domain approach (SDA) with a newly proposed and tested set of basis functions can efficiently and accurately determine the complex modes of a class of general planar transmission line problems if the complex modes exist. Under the case studies of this paper, it shows that the complex modes may exist in every shielded microstrip lines. Both convergence study and the cross-sectional field patterns, which guarantee the correct boundary conditions being satisfied, confirm the validity of the solutions for complex modes. Theoretical results for fundamental, higher order, evanescent, and complex modes are presented for symmetric coupled microstrip lines.

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