Abstracts

Computations for radiation and surface-wave losses in coplanar waveguide bandpass filters

A new approach is developed to simulate both radiation and surface-wave losses in general coplanar waveguide (CPW) discontinuity structures. The newly derived formulas are concise, simple, and efficient for computation. Full-wave characterization of CPW filter structures are first accomplished by the mixed-potential integral equation and the method of moments. Given equivalent magnetic-current distributions on the apertures of a CPW, the matrix pencil approach is applied to extract the scattering parameters and the new formulas are employed to obtain the losses and far-field patterns of the space-wave radiation and surface wave. Simulation of the calculated radiation and surface-wave losses by field theory is found to be consistent to the total power loss determined from the scattering parameters by circuit theory, which verifies the correctness of our new expressions.

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