Abstracts

A Planar-Lumped Model for Coupled Microstrip Lines and Discontinuities

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This paper presents a convenient model for analyzing coupled microstrip line discontinuities. Similar to the planar waveguide model for single microstrip lines, a planar-lumped model is developed for coupled microstrip lines. Fields underneath the two strips and those fringing at the outer edge are modeled by two equivalent planar waveguides. Electric and magnetic field coupling in the gap region is modeled by a lumped network. The lumped network parameters are evaluated such that [C] and [L] matrices for the model are identical with those for coupled lines. The model is verified by comparing coupler characteristics with those obtained by the conventional coupled line analysis. Just as the planar model of a single microstrip has been used for characterizing microstrip discontinuities, the planar-lumped model developed here is used for coupled line discontinuities. Examples given here include a coupled microstrip section with chamfered right-angled bends to single microstrip lines, for which the results are in good agreement with experimental values.

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