Abstracts

The Effects of the Coupled Slotline Mode and Air-Bridges on CPW and NLC Waveguide Discontinuities

C.-Y. Lee, Y. Liu and T. Itoh. "The Effects of the Coupled Slotline Mode and Air-Bridges on CPW and NLC Waveguide Discontinuities." 1995 Transactions on Microwave Theory and Techniques 43.12 (Dec. 1995, Part II [T-MTT] (1995 Symposium Issue)): 2758-2764.

The extended spectral domain analysis is applied to analyze symmetrical and asymmetrical coplanar and non-leaky coplanar waveguide discontinuities. The three-dimensional dyadic Green's function is derived first to calculate the contributions of horizontal (vertical) magnetic (electrical) currents. No air-bridges are needed if the discontinuity is symmetrical. It is shown that the coupled slotline (CSL) mode excited by asymmetrical discontinuities drastically affects the CPW circuit performance. The effect of air-bridges used to suppress the unwanted CSL mode is studied. Experimental data agree very well with numerical results for CPW discontinuities. In addition, the discontinuities of a novel conductor-backed CPW structure, the nonleaky coplanar (NLC) waveguide, are also investigated. From experiment, it is found that the SMA-to-NLC transition causes power leakage. Except for the small leakage, theoretical and experimental results agree well.

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