Abstracts

Broadside Coupled Strip Inset Dielectric Guide and its Directional Coupler Application

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A theoretical and numerical method is presented for the analysis of broadside-coupled strip inset dielectric guide. The method of analysis is based on an integral equation formulation and Galerkin's procedure. Besides propagation constants for two fundamental and higher order modes, the characteristic impedances for the two fundamental modes are calculated using the total propagating power and the longitudinal strip currents. The propagation characteristics of the two fundamental modes are then used to compute 4-port circuit parameters that are essential for accurate analysis and design of coupled line circuits. The effects of various structural parameters on the S-parameters are investigated and it is found that this broadside coupled strip IDG structure is useful for the realization of the directional couplers. Examples of strong and weak directional couplers are given. Furthermore, the propagation constants and S-parameters of coaxially excited coupled strips are measured, and are in good agreement with the theoretical analysis.

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