Abstracts

Novel planar, square-shaped, dielectric-waveguide, single-, and dual-mode filters

Chi-Yang Chang and Wei-Chen Hsu. "Novel planar, square-shaped, dielectric-waveguide, single-, and dual-mode filters." 2002 Transactions on Microwave Theory and Techniques 50.11 (Nov. 2002 [T-MTT] (Mini-Special Issue on the 2002 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 2527-2536.

This paper presents a novel concept of a square-shaped dielectric-waveguide resonator, which can easily realize a dielectric-waveguide cross-coupled filter or a dielectric-waveguide dual-mode filter, using the conventional printed circuit board (PCB) process. This planar dielectric-waveguide resonator has a higher Q value than a microstrip resonator. The physical mechanisms of both single- and dual-mode filters are elucidated. Some new coupling structures are developed for undergoing the PCB process. Filter design procedures are detailed. Design curves for the coupling coefficients of internal- and external-coupling structures are determined by full-wave finite-element-method electromagnetic calculations. Measurement results are highly consistent with theory for all trial filters. This study offers an effective means of producing low-cost high-performance planar circuit filters.

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