Abstracts

Precise computations of resonant frequencies and quality factors for dielectric resonators in MICs with tuning elements

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In this paper, the highly accurate results of resonant frequencies, field distributions, and quality factors of the TE/sub 01/spl delta// mode for the cylindrical shielded dielectric resonator (DR) in microwave integrated circuits (MIC's) with a practical tuning element, such as the metallic tuning screw and the dielectric tuning device, are presented. By using the newly developed FD-SIC method, numerical results can be calculated accurately and efficiently. The DR structures with tuning elements can be more easily modeled by the present approach than the other methods using approximate solutions or the mode-matching (MM) methods. Numerical results in the literature are compared to the present FD-SIC results for the DR without tuning elements and detailed discussions on these results are given. In addition, design curves are also presented for the DR with the metallic tuning screw and with the dielectric tuning device. These design curves are helpful for designing DR systems with tuning elements in MIC applications.

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