Abstracts

Resonant frequency and quality factors of a silver-coated /spl lambda//4 dielectric waveguide resonator

A. Chandra Kundu and I. Awai. "Resonant frequency and quality factors of a silver-coated /spl lambda//4 dielectric waveguide resonator." 1998 Transactions on Microwave Theory and Techniques 46.8 (Aug. 1998 [T-MTT]): 1124-1131.

In this paper, resonant frequency, radiation loss, conductor loss, and dielectric loss of a silver-coated /spl lambda//4 dielectric waveguide resonator are investigated. Leakage of the electromagnetic field from the open-end face of the resonator is the only source of radiation, which also affects the resonant frequency. New theoretical expressions are devised to calculate resonant frequency, conductor quality (Q) factor, dielectric Q factor, and radiation Q factor. Effective conductivity of the silver-coated resonator is estimated from experimental unloaded Q factor. The theoretical analysis is validated by the experimental result and the data obtained using the finite-difference time-domain (FDTD) technique. Finally, we have designed and fabricated a dual-mode bandpass filter using this resonator.

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