Abstracts

Tunable, Temperature-Compensated Dielectric Resonators and Filters

S.-W. Chen, K.A. Zaki and R.G. West. "Tunable, Temperature-Compensated Dielectric Resonators and Filters." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1046-1052.

A thermal and an electromagnetic model of a tunable hybrid-mode dielectric double resonator is introduced and then analyzed by the mode-matching technique. Results of the analysis show the temperature sensitivity of the structure as a function of the center frequency as well as the other resonator parameters. A simple optimization procedure is described which allows the design of the resonator to simultaneously have a wide tunability range and good thermal stability of the resonant frequency. A circuit model is presented for a tunable four-pole dual-mode filter. The model exhibits interesting dual pass-bands, separated by a very high attenuation stopband. Measured results obtained from an experimental four-pole dual-mode dielectric resonator filter designed using the tunable hybrid-mode resonators showed excellent tunability range (200 MHz at C-band) and good agreement with the circuit model.

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