Abstracts

Systematic evaluation and analysis for 60-GHz dielectric resonators coupled to a microstrip line on a GaAs substrate

K. Hosoya, T. Inoue, M. Funabashi and K. Ohata. "Systematic evaluation and analysis for 60-GHz dielectric resonators coupled to a microstrip line on a GaAs substrate." 1998 Transactions on Microwave Theory and Techniques 46.4 (Apr. 1998 [T-MTT]): 352-358.

This paper presents the first systematic evaluation and analysis of 60-GHz-band TE/sub 01/spl delta//-mode cylindrical dielectric resonators coupled to a microstrip line on a GaAs substrate. The loss components of the unloaded Q are analyzed using simple numerical techniques. The distance between the resonator center and the microstrip line which gives the maximum coupling coefficient is found to be approximately 3/5 of the resonator radius, whose ratio is almost constant for all practical cases. The temperature characteristics are also demonstrated and the origins of temperature dependences of the unloaded Q and the coupling coefficient are discussed. An equivalent circuit model for the dielectric resonator coupled to the microstrip line is presented, whose element parameters can express the dependences of the resonant frequency, the unloaded Q, and the coupling coefficient on the structural parameters and the temperature.

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