Abstracts

Coupling Characteristics of Eccentric Arranged Dielectric Disk and Ring

Q. Han, Y. Kogami, Y. Tomabechi and K. Matsumura. "Coupling Characteristics of Eccentric Arranged Dielectric Disk and Ring." 1996 Transactions on Microwave Theory and Techniques 44.11 (Nov. 1996 [T-MTT]): 2017-2024.

An analysis is presented for a novel coupling configuration in which a circular dielectric disk and ring are arranged eccentrically. Whispering gallery (WG) mode coupling characteristics between the dielectric disk and ring are investigated. In this paper, a coupled-mode equation based on the Lorentz's reciprocity theorem is utilized. Distributed coupling coefficients and electric field distributions around the coupling region are obtained numerically through solving the coupled-mode equation. The theory described in this paper is confirmed by comparing measured electric field distributions with calculated ones. Electromagnetic powers flowed along the disk are also calculated. It is shown that coupling quantity of the eccentric configuration would be easily controlled by changing a radius of the disk or ring. The results obtained here will be used to design a WG mode coupled resonator for millimeter wave integrated circuits.

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