Abstracts

Dual Mode Coupling by Square Corner Cut in Resonators and Filters (Dec. 1992 [T-MTT])

X.-P. Liang, K.A. Zaki and A.E. Atia. "Dual Mode Coupling by Square Corner Cut in Resonators and Filters (Dec. 1992 [T-MTT])." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2294-2302.

A new method for realization of dual mode coupling in rectangular waveguide cavities is described and analyzed. The method completely replaces the coupling screw, and therefore can be used to eliminate the need for tuning in dual mode waveguide cavity filters. It also offers a wide range of coupling values and can achieve higher power handling capability than coupling screws. Mode matching method is used to calculate the mode chart of the infinitely long square corner cut rectangular waveguide (SCCRW), the field distributions of each mode, and the resonant frequencies of the cavity. Evanescent mode rectangular waveguide is used to provide dual mode couplings between adjacent cavities. The junction discontinuity between the SCCRW and the rectangular waveguide is modeled by double mode matching method, obtaining modal scattering parameters of the junction. A 4-pole dual mode elliptic function rectangular waveguide cavity filter using the new coupling method was constructed. The natural frequencies of the whole filter structure is calculated and is verified by measurements. The experimental filter results showed excellent agreement with theory.

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