Abstracts

An optimal circular-waveguide dual-mode filter without tuning screws

Ke-Li Wu. "An optimal circular-waveguide dual-mode filter without tuning screws." 1999 Transactions on Microwave Theory and Techniques 47.3 (Mar. 1999 [T-MTT]): 271-276.

A novel circular-waveguide dual-mode (CWDM) filter structure is proposed. The coupling between the degenerate modes in the same cavity is provided by an off-centered circular iris built in at the middle of the resonant cavities. Considering the facts of: (1) simplicity of the mechanical process; (2) a potentially high Q; (3) a wide spurious-free frequency band; and (4) the effectiveness of electromagnetic (EM) modeling, the structure can be considered as an optimal coupling structure for CWDM filters when a precise EM design is required. A rigorous mathematical proof is given for explaining its working mechanism. The detailed formulations for designing the new coupling structure is also discussed. To validate the new structure, a narrow-bandwidth four-pole Ku-band elliptic filter is designed, manufactured and tested. Very good agreement is obtained between the calculated and measured responses.

❑ Return to main document.