Abstracts

Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters

J. Bornemann and F. Arndt. "Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1104-1113.

Utilizing the rigorous field distribution of the ridge waveguide eigenmodes, this paper presents an accurate computer-aided design of compact, low-cost, low-insertion-loss evanescent-mode waveguide band-pass filters with bilateral metallic E-plane fins. The design theory takes into account the influences of both the finite fin thickness and the higher order mode interaction at all discontinuities. The numerical advantage of the transverse resonance method for solving the related cross-sectional eigenvalue problem is demonstrated for the design of quasi-high-pass and band-pass filters of different ridge gap widths and is compared with the classical standing wave and resonator mode-matching techniques. Computer-optimized design data are given for filters with passbands in X-band (8-12 GHz) and E-band (60-90 GHz), which achieve high skirt selectivity and wide stopband. The theory is verified by measurements.

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