Abstracts

An elliptical cavity for triple-mode filters

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An empty cavity resonator with elliptical cross-section is proposed for realizing triple-mode narrowband filters. Triple-mode coupling is generated by the step discontinuity between the input rectangular waveguide and an inclined-displaced elliptical waveguide resonator. Proper choice of ellipticity, inclination angle, and displacement of the cavity with respect to input iris, allows one to control generation of the three resonant modes inside the cavity. Representative prototypes of elliptical cavities exhibiting various degrees of coupling have been carefully measured proving the accuracy of the model and its applicability for narrowband X/Ku band filter design. The full-wave analysis of a complete 6-pole triple-mode filter demonstrates the capability of generating elliptical responses with finite transmission zeros.

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