Abstracts

High-Power Microwave Rejection Filters Using Higher-Order Modes

J.H. Vogelman. "High-Power Microwave Rejection Filters Using Higher-Order Modes." 1959 Transactions on Microwave Theory and Techniques 7.4 (Oct. 1959 [T-MTT]): 461-465.

In order to obtain filters capable of handling very high power, the use of radial lines and uniform line discontinuities was investigated. Forty-five-degree tapers and uniform lines were used to design a high-power microwave filter capable of handling 700 kw at 15 pounds pressure in a 0.900 by 0.400 ID waveguide. In addition to the filtering which results from the discontinuities in the TE/sub 10/ mode in the waveguide, high insertion loss elements are effected when the enlarged uniform line section is larger than the TE/sub 10/ mode waveguide wavelength and when the length of the enlarged section is approximately (2n -1)lambda/sub g//4. Extremely large insertion losses are possible by the cascading of these elements. Tuning, in the standard-size waveguide, has no effect on the insertion loss of the higher-mode enlarged waveguide at its resonant frequency. Empirical design formulas are evolved and the design procedure for band-rejection filters is given, using these high insertion loss elements.

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