Abstracts

Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide

C. Yeh, F.I. Shimabukuro and J. Chu. "Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 691-702.

Dielectric ribbon waveguide supporting the /sub e/HE/sub 11/ dominant mode can be made to yield an attenuation constant for this mode of less than 20 dB/km in the millimeter/submillimeter-wavelength range. The waveguide is made with a high-dielectric-constant, low-loss material such as alumina or sapphire. It takes the form of thin dielectric ribbon surrounded by lossless dry air. A detailed theoretical analysis of the attenuation and field extent characteristics for the low-loss dominant/sub e/HE/sub 11/ mode along a ribbon dielectric waveguide was carried out using the exact finite-element technique as well as two approximate techniques. Analytical predictions were then verified by measurements on ribbon guides made with Rexolite using the highly sensitive cavity resonator method. Excellent agreement was found.

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