Abstracts

Submillimeter Guided-Wave Experiments with Polyethylene Slab Waveguides

M. Tsuji, K. Kawai, H. Shigesawa and K. Takiyama. "Submillimeter Guided-Wave Experiments with Polyethylene Slab Waveguides." 1979 Transactions on Microwave Theory and Techniques 27.11 (Nov. 1979 [T-MTT]): 873-878.

The attenuation constants of a symmetric polyethylene slab waveguide are measured in the submillimeter-wave region at lambda/sub 0/= 337 µm. In our experiments the fine metal grating is used as a coupler, instead of a usual prism coupler. Our coupler which is different from the conventional grating coupler fixed on a slab is easily movable along a slab without a fluctuation in the coupling efficiency, and the loss measurement is successfully performed for several kinds of slab thicknesses by using such couplers. As a result, the attenuation constant of about 1.3 dB/m is measured, in good reliability, for a slab of 10 µm in thickness. Finally, to make clear the accuracy of our loss measurements, the transverse broadening of the field along the propagating direction of a slab is measured experimentally, and it is concluded that there is little influence of the transverse broadening on the measured attenuation constants.

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