Abstracts

Anomalous Low-Loss Transmission in a Gas-Confined Dielectric Waveguide for Millimeter and Submillimeter Wavelengths (Short Papers)

K. Yamamoto. "Anomalous Low-Loss Transmission in a Gas-Confined Dielectric Waveguide for Millimeter and Submillimeter Wavelengths (Short Papers)." 1981 Transactions on Microwave Theory and Techniques 29.9 (Sep. 1981 [T-MTT] (Special Issue on Open Guided Wave Structures)): 983-987.

A novel low-loss (gas-confined) dielectric waveguide for millimeter and submillimeter wavelengths was previously reported by the author. The waveguide consists of a thin dielectric tube separating an internal high-dielectric-constant gas from an external low-dielectric-constant gas. The attenuation constant of this form of waveguide usually increases with increasing tube thickness. The thick tube is indispensable for a mechanically stable waveguide. In this paper, anomalous low-loss transmission characteristics in a gas-confined dielectric waveguide with a thick tube are described. Some condtions are theoretically found where the attenuation constant of the waveguide with a thick tube is extremely low, due to tight field confinement within the internal gas. A qualitative explanation of the operation mechanism is also given.

❑ Return to main document.