Abstracts

Millimeter wave measurements of temperature dependence of complex permittivity of GaAs plates by a circular waveguide method

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A circular waveguide method is improved to measure the complex permittivity of low loss dielectric plates using the TE/sub 0m1/ mode with integer m of the higher order accurately in the millimeter wave range. The measurement principle is described on the basis of a rigorous analysis by the mode matching technique. A mode chart presented is effective to identify many resonance modes observed in the measurement. The temperature dependences for GaAs plates were measured at 26 GHz for the TE/sub 011/ mode and at 40 GHz for the TE/sub 021/ mode. It is verified that this method is useful to measure the temperature dependence precisely. Moreover it is expected to be able to evaluate the quantity of lattice defects of GaAs crystal.

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