Abstracts

Microwave Measurement of a Complex Dielectric Constant Over a Wide Range of Values by Means of a Waveguide-Resonator Method

C. Das Gupta. "Microwave Measurement of a Complex Dielectric Constant Over a Wide Range of Values by Means of a Waveguide-Resonator Method." 1974 Transactions on Microwave Theory and Techniques 22.4 (Apr. 1974 [T-MTT]): 365-372.

A new method of measuring complex dielectric constants at microwave frequencies by introducing a resonant circuit comprised of the experimental sample within a waveguide is described. The theoretical evaluation of working equations for the complex dielectric constant under the quasi-stationary distribution of the field within the sample is given. In this case, the equations are derived 1) considering the elements as lumped parameters and 2) distributed parameters are treated by means of transmission line equations. The two sets of equations are compared. The working equations are also derived for the condition when the experimental sample takes up the form of a radial line. The accuracy of determining the parameters is computed and experimental results are provided as verification of the applicability of the given method.

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