Abstracts

Determination of Complex Permittivity of Arbitrarily Dimensioned Dielectric Modules at Microwave Frequencies

W. Rueggeberg. "Determination of Complex Permittivity of Arbitrarily Dimensioned Dielectric Modules at Microwave Frequencies." 1971 Transactions on Microwave Theory and Techniques 19.6 (Jun. 1971 [T-MTT]): 517-521.

A method of evaluating the microwave dielectric properties of any geometrically defined sample is described by general theory and through experimental verification. The typical mathematical relations that describe specimen loss tangent by cavity methods are uniquely modified through inclusion of the derivative of cavity resonant frequency with respect to dielectric constant of the material comprising the particular configuration studied. The dielectric modules under study need not meet the small volume requirements demanded by perturbation theory; they may even occupy a very large volume of the cavity. A particular advantage of the described evaluation technique is the continuity of use of a given dielectric specimen for tests at microwave frequencies, without geometric alteration, after its properties at lower frequencies have been determined.

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