Abstracts

Two new measurement methods for explicit determination of complex permittivity

C. Wan, B. Nauwelaers, W. De Raedt and M. Van Rossum. "Two new measurement methods for explicit determination of complex permittivity." 1998 Transactions on Microwave Theory and Techniques 46.11 (Nov. 1998, Part I [T-MTT]): 1614-1619.

This paper presents two new measurement methods for explicit determination of complex permittivity. For the first time, these methods combine the explicit algorithm with a simplified yet accurate error-correction technique. The combination is made possible by the use of one sample of single length and another of double length. For low-loss materials, one of the methods is valid for any sample length and independent of sample positions, but needs a prior estimate of the permittivity, while the other requires no such estimate, but avoidance of the single length being multiples of half-wavelength in the sample. For high-loss materials, both methods may need the estimate. Advantages of each method can be taken if both methods are used simultaneously. Experimental results from the proposed methods show excellent agreement with those from a recent iterative method. Errors arising from small deviations from the double length are also analyzed and presented. The validity, explicitness, and simple error-correction capability make the new methods very useful.

❑ Return to main document.