# Abstracts

## Open-ended coaxial probe for high-temperature and broad-band dielectric measurements

*D.L. Gershon, J.P. Calame, Y. Carmel, T.M. Antonsen, Jr. and R.M. Hutcheon. "Open-ended coaxial probe for high-temperature and broad-band dielectric measurements." 1999 Transactions on Microwave Theory and Techniques 47.9 (Sep. 1999, Part I [T-MTT]): 1640-1648.*

A stainless steel open-ended coaxial probe was developed to measure the complex permittivity of solid dielectric materials at elevated temperatures and over a broad frequency range. The spring loading of the inner conductor insured that the probe maintained contact with the sample up to 1000/spl deg/C and eliminated errors due to differential thermal expansion of the probe. Comparison with an industry standard probe demonstrated that the spring-loaded probe accurately and reproducibly measured the complex permittivity of several samples over a broad frequency range of 0.3-6 GHz at room temperature. At temperatures up to 1000/spl deg/C, dielectric measurements of a glass ceramic and of a porous alumina composite performed with both a spring-loaded probe and a resonant cavity agreed to within 8% for the real part and 15% for the imaginary part of the complex permittivity. The probe's insensitivity in measuring low-loss materials constrained accurate dielectric measurements to materials with tan /spl delta//spl ges/0.05. Finally, optimization of an open-ended probe by varying the probe dimensions is presented.

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