Abstracts

The Use of Coxial Probes for Precise Dielectric Measurements: A Reevaluation

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A convenient method has been developed during the past few years for study in the dielectric properties of materials. The method consists of placing the open end of a semirigid coaxial line against the sample and measuring the probe reflection coefficient with an automated network analyzer (ANA). As part of an ongoing attempt to confirm previous reports of resonant-type absorption in DNA solutions at 1-10 GHz, we have analyzed the technique to estimate the magnitude of resonance-type artifacts expected from instrumental factors. Tire reflection coefficients of the probe were measured using the HP-8510 ANA with time domain gating to exclude connector artifact. We propose an improved probe technique that greatly diminishes artifacts arising from variation of the probe from nominal dimensions, and radiation conductance above 1 GHz.

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