Abstracts

A Novel Analytic Method for the Broadband Determination of Electromagnetic Impedances and Material Parameters

R. Pelster. "A Novel Analytic Method for the Broadband Determination of Electromagnetic Impedances and Material Parameters." 1995 Transactions on Microwave Theory and Techniques 43.7 (Jul. 1995, Part I [T-MTT]): 1494-1501.

A simple analytic technique is described that allows the determination of complex impedances from quasistatic frequencies (some Hz) up to 2 GHz with one setup and a single sweep. Samples are placed in a shielded capacitor-like measurement cell that is inserted into a transmission line. The transmission coefficient of the setup is measured for one signal direction, i.e., only two receiver channels are needed. A complete calibration is achieved with only two standards. Dielectric and, with restrictions in the frequency range, magnetic material parameters can be determined via these impedance measurements. Temperature-dependent calibration and measurement are possible and even low losses down to tan delta = 5 · 10/sup -4/ and small impedances Z >= 0.05 Omega can be determined. The applicability of the method is experimentally verified over a frequency range of nearly nine decades from 5 Hz to 2 GHz.

❑ Return to main document.