Abstracts

A planar resonant sensor for the complex permittivity characterization of materials

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A microwave planar resonant sensor for the measurement of the complex permittivity in compact areas and thin layers of the material under test (MUT) is presented. Compared to transmission or reflection sensors, the adoption of a scalar 2-port measurement procedure reduces the cost of the system and improves its robustness. Compared to coaxial line sensors, a substantial cost reduction is achieved. The low cost of the sensor allows its use even in a disposable manner. Through the fullwave characterization of the probe a simple equivalent semilumped model of the interaction with the MUT has been derived along with a software calibration procedure. An excellent measurement accuracy in a wide range of complex dielectric permittivities is shown to be feasible.

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