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Electrical Impedance: Principles, Measurement, and Applications provides a modern and much-needed overview of electrical impedance measurement science and its application in metrology, sensor reading, device and material characterizations. It presents up-to-date coverage of the theory, practical methods, and modeling. The author covers the main impedance measurement techniques, stressing their practical application. The book includes a large set of measurement setup schematics, and diagrams and photos of standards and devices. It also offers an extensive list of references to both historical and recent papers on devices, methods, and traceability issues.

Reviews the main definitions of the quantities related to impedance, some theorems of particular interest, the issue of impedance representation, and introduces the problem of impedance definition

Lists devices, appliances, circuits, and instruments employed as building blocks of impedance measurement setups

Classifies the main impedance measurement methods, including details on their implementation when a specific impedance definition is chosen

Discusses the increasing use of mixed-signal electronics in impedance measurement setups

Covers applications including details on the measurement of electromagnetic properties of materials

Introduces impedance metrology, including artifact impedance standards, and the realization and reproduction of SI impedance units