

A Review of the Four-Probe Method for Electrical Resistivity Measurement and its Engineering Applications

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Abstract: *The four-probe method is a well-established technique for measuring the electrical resistivity of various materials, notably semiconductors, metals, thin films, and nanomaterials. Its primary advantage lies in eliminating contact resistance errors, making it essential for applications requiring precise resistivity measurements. This paper provides a comprehensive review of the theoretical principles, working mechanism, instrumentation, and key engineering applications of the four-probe method. Additionally, recent advancements in the technique and its impact on material science and semiconductor engineering are discussed*

Keywords: Electrical resistivity, Four-probe method, Semiconductor, Thin films, Nanotechnology, Contact resistance