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JJF 1760-2019

Calibration Specification for Standard Slices of Single Crystal Silicon Resistivity

硅单晶电阻率标准样片校准规范

(English Translation)

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Introduction

This specification is based on JJF 1071-2010 "Rules for Compiling National Measurement and Calibration Specifications" and JJF 1059.1-2012 Compilation of "Measurement Uncertainty Evaluation and Representation".

This specification replaces JJG48-2004 "Silicon Single Crystal Resistivity Standard Sample", compared with JJG48-2004, except in addition to the editorial changes, the main technical changes are as follows.

--- Added introduction, cited documents, terminology and unit of measurement;

--- Removed the level classification of silicon single crystal resistivity standard samples;

--- Removed the cleaning method of silicon single crystal resistivity standard sample;

--- Modified the measurement range of resistivity, changed from the original 0.005ohm · cm ~ 5000ohm · cm 0.003ohm · cm ~ 1000ohm · cm;

--- Modified the calibration method of the silicon single crystal resistivity standard sample diameter;

--- Modified the calibration method of silicon single crystal resistivity standard sample thickness;

--- Modified the calibration method of the uniformity of the radial resistivity of the standard

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sample of silicon single crystal resistivity.

Previous releases of this specification.

--- JJG48-2004;

--- JJG48-1990.

Calibration Specification for Standard Sample of Silicon Single Crystal Resistivity

1 Scope

This specification applies to silicon single crystal resistivity standard samples with resistivity between 0.003ohm · cm ~ 1000ohm · cm Calibration.

2 Reference documents this specification refers to the following documents.

JJG508-2004 Four Probe Resistivity Tester GB/T 14264 Terminology of semiconductor materials for dated reference documents, only the dated version applies to this specification; for those without date references the latest version (including all amendments) is applicable to this specification.

3 Terms and units of measurement

3.1 Resistivity

A measure of the degree to which a charged carrier is blocked by a material. Resistivity is the reciprocal of conductivity. Symbol is rho, unit it is ohm · cm.

3.2 Thickness

The distance through the wafer through a given point on the wafer perpendicular to the surface direction. Usually the thickness of the geometric center of the wafer is the nominal thickness of the wafer. The unit is μm.

3.3 diameter

The length of the line that traverses the surface of the wafer, passes the center point of the wafer, and does not intersect with the reference plane or other reference areas on the circumference degree. The unit is mm.

3.4 Sheet resistance the sheet resistance of a semiconductor or thin metal film, the potential gradient parallel to the current multiplied by the current density and thickness ratio. Also called square resistance. The symbol is Rs and the unit is ohm/-.

3.5 Conductivity type Conductive characteristics determined by the nature of most carriers in semiconductor materials.

3.6 Four-point probe A point probe device for measuring the resistivity of materials. One pair of probes is used to pass the current flowing through the sample, the other the probe measures the potential difference caused by the current.

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3.7 Regional uniformity of radialresistivity the center point of the wafer and a number of symmetrically distributed set points (typical settings the change of resistivity between the radius of 5mm and the radius of 10mm from the center point is taken. Divide the maximum difference by medium Interval, expressed as a percentage.

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