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**Measuring methods of shielding effectiveness of materials
(English Translation)**

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1 Scope

This standard specifies the methods for measuring resistivity, hall coefficient and determining hall mobility in semi-insulating GaAs single crystals.

This standard applies to the measurement of electrical parameters of semi-insulating GaAs single crystals, which have a resistivity in the range of $10^4 \text{ ohm}\cdot\text{cm} \sim 10^9 \text{ ohm}\cdot\text{cm}$.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 4326 Extrinsic semiconductor single crystals measurement of Hall mobility and Hall coefficient

GB/T 14264 Semiconductor materials - Terms and definitions

3 Terms and definitions

The terms and definitions, which are defined in GB/T 14264, apply to this document.

4 Principles of the method

When a current I is passed along the X-axis direction, on a rectangular semiconductor sheet, AND a magnetic field B is applied in the Z-axis direction, a potential difference

V_H is generated in the direction, which is perpendicular to the current and magnetic field (that is, the Y-axis direction). This phenomenon is called Hall effect, wherein V_H is called the Hall voltage. The cause of the Hall effect is the Lorentz force of the charged particles, that form the directional movement of the current, that is, the carrier in the magnetic field. The Hall effect can be used to measure the electrical parameters of the semi-insulating GaAs single crystals.

5 Interfering factors

Measurement temperature, ohmic contact electrode preparation, etc. will all affect the measurement results.

6 Instruments

The measuring instrument consists of the following parts:

- a) Hall test system. The applied magnetic field strength is 0.3 T ~ 1.0 T; the uniformity of the magnetic field within the sample measurement range is better than 1%; the input impedance is lower than 1013 ohm; the accuracy of the current source is better than 1%; the temperature accuracy is better than 0.1 °C;
- b) Micrometer, accuracy ± 0.01 mm;
- c) Sample holder, protected from light.

7 Environmental requirements

The ambient temperature is 22 °C ~ 24 °C; the relative humidity is less than 60%. The test shielding room shall not have mechanical shock, vibration, or electromagnetic interference.

8.1 Cutting, grinding, cleaning of specimen

Follow the requirements of GB/T 4326, to carry out cutting, grinding, cleaning of specimen.

8.2 Ohm contact electrodes

Follow the requirements of GB/T 4326, use In, AuGe/Au or AuGe/Ni alloys to prepare ohmic contact electrodes.

9 Measurement procedure

Make measurement, according to the measurement steps which are specified in GB/T 4326.

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