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YS

**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 14-2015

Replacing YS/T 14-1991

**Test method for thickness of heteroepitaxy layers and
polycrystalline layers**

异质外延层和硅多晶层厚度的测量方法

(English Translation)

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces YS/T 14-1991 "Method for measuring the thickness of heteroepitaxial layers and silicon polycrystalline layers".

This standard and YS/T 14-1991 "heteroepitaxial layer and silicon polycrystalline layer thickness measurement method" compared to the main changes are as follows.

- measuring range from $1\mu\text{m} \sim 20\mu\text{m}$ to $1\mu\text{m} \sim 100\mu\text{m}$;
- Added normative references to documents and interference factors;
- Method summary in the use of surface step meter to measure the height of the bench instead of surface finish measuring height;
- modified the sample preparation process, measurement steps and Figure 1, Figure 2;
- recalculate the precision.

This standard is proposed by the National Committee for Standardization of Nonferrous Metals (SAC/TC243).

The drafting of this standard. Nanjing Guosheng Electronics Co., Ltd., a new research materials Co., Ltd., Shanghai Crystal Union Silicon Materials Co., Ltd..

1 Scope

This standard specifies the measurement method for the thickness of the heteroepitaxial layer and the silicon polycrystalline layer.

This standard is applicable to measuring the thickness of the heteroepitaxial layer and the silicon polycrystalline layer with an interface layer thickness between the substrate and the

deposited layer of less than 100 nm, the measurement range is 1 μ m ~ 100 μ m.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 6617 Wafer resistivity determination Extended resistance probe method
GB/T 14264 terminology for semiconductor materials Measurement of Infrared Reflectance of Light - Doped Silicon Epitaxial Layer on heavily Doped Substrates

3 Terms and definitions

GB/T 14264 The terms and definitions defined apply to this document.

4 Method summary

In the surface of the test sample, in addition to leaving a certain measurement area outside all the wax hiding, the reserved area of the measured layer corrosion, the formation of A step. The thickness of the heteroepitaxial layer or the silicon polycrystalline layer can be obtained by removing the mask wax and measuring the height of the step with a surface step meter.

5 Interference factors

5.1

Ambient temperature and humidity, instrument vibration will affect the measurement results.

5.2

The finish after surface treatment of the specimen will affect the measurement trajectory.

5.3

The unevenness of the two measuring trajectories will affect the measurement accuracy.

6 Reagents and materials

6.1

hydrofluoric acid. $\rho = 1.15$ g/mL, analytical grade.

6.2

nitric acid. $\rho = 1.42$ g/mL, analytical grade.

6.3

high purity water. resistivity greater than 2Mohm · cm (25 °C).

6.4

Trichlorethylene. Analytical purity.

6.5

anhydrous ethanol. analytical grade.

6.6

Chemical etching agent A. A mixture of hydrofluoric acid (6.1). nitric acid (6.2) = 1. 80.

6.7

Chemical etching agent B. hydrofluoric acid (6.1). nitric acid (6.2) = 1. 10 mixture.