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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 14144-2009

Replacing GB/T 14144-1993

**Testing method for determination of radial interstitial oxygen
variation in silicon**

硅晶体中间隙氧含量径向变化测量方法

(English Translation)

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Foreword

This revised standard adopts SEMIMF1188-1105 "standard method for measuring interstitial oxygen atoms in the silicon content by infrared absorption method." this standard compared with SEMIMF1188-1105, have the following main differences.

- Increasing the measurement points selected program;
- Standard prepared according to GB/T 1.1 format, part of SEMI standard chapters of the merger and consolidation.

This standard replaces GB/T 14144-1993 "interstitial oxygen content in the silicon crystal radial variation measurement method." this standard compared with the original standards, the main changes are as follows.

- Oxygen content measurement range has been revised;
- Added "measuring instrument", "term" and "disturbing factors" section;
- Increase the use of certified reference materials oxygen content in the silicon content spectrometer calibration;
- Original standard "This standard applies to room temperature resistivity greater than $0.1\text{ohm} \cdot \text{cm}$ silicon crystal" to "This standard applies to electrical room Greater than $0.1\text{ohm} \cdot \text{cm}$ resistivity n-type silicon single crystal at room temperature is greater than $0.5\text{ohm} \cdot \text{cm}$ resistivity p-type silicon single crystal";
- Sample thickness range changed to "0.04cm ~ 0.4cm".

This standard by the National Standardization Technical Committee of semiconductor equipment and materials proposed.

This standard by the National Standardization Technical Committee materials and equipment at the Technical Committee of semiconductor material.

This standard was drafted. Emei Semiconductor Material Factory.

1 Scope

Measuring the change in the silicon crystal radial interstitial oxygen content of the present standard by infrared spectroscopy. The need to use the standard reference sample and an anaerobic Sets certified standard samples used to calibrate the device.

This standard applies to room temperature resistivity greater than $0.1\Omega\cdot\text{cm}$ at room temperature and n-type silicon single crystal resistivity greater than $0.5\Omega\cdot\text{cm}$ p-type silicon Single crystal gap measure oxygen content.

The effective scope of the standard to measure the oxygen content of the gap from $1 \times 10^{16}\text{at}\cdot\text{cm}^{-3}$ to the silicon crystal maximum solubility of oxygen.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 1557 interstitial oxygen content in the silicon crystal infrared absorption measurement method GB/T 14264 semiconductor material terms

3 Terms

GB/T 14264 and specified the following terms and definitions apply to this standard.

A method of using a prism or a grating as dispersive element infrared spectrometer. It does this by amplitude - get data wavenumber (or wavelength) spectrum.

Wavenumber (or wavelength) spectrum to get the data - one for the amplitude of the Fourier transform interferometer obtained by converting the interference spectrum infrared spectrometer.

Reference sample spectrum. When measured with a double beam spectrometer which can directly reference sample into the light path, so that the reference light Road empty obtained; when measured with a single beam spectrometer, it can be a reference sample spectrum obtained by the infrared light path is calculated after deducting background After obtaining spectra.

Spectrum of the test sample. When measured with a double beam spectrometer, it can be directly tested sample into the light path, so that the reference light Road empty obtained; when using single-beam spectrometer, which is by the test samples were placed in the optical path of infrared spectra obtained after deducting the background spectrum count Out.

4 Principle of the method

Use a calibrated infrared spectrometer and a suitable reference material, obtained by a double-sided polished silicon wafer containing oxygen reference method infrared transmission spectrum