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GB/T 43885-2024

Silicon carbide epitaxial wafers

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents"

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1 Scope

GB/T 43885-2024 is the Chinese standard for silicon carbide epitaxial wafers, the substrates on which SiC power devices are built. SiC has become the material of electric vehicle traction inverters and of fast charging, China is investing in the whole chain from crystal to device, and the epitaxial layer is where the device's blocking voltage and on-resistance are actually determined. The specification is therefore a list of things that must not be present: the thickness and doping of the epilayer and their uniformity across the wafer, the surface defects, triangles, carrots, downfalls and comets, whose density directly costs die, the basal plane dislocations that cause bipolar degradation, the surface roughness and particles, the warp and bow, and the resistivity and orientation of the substrate beneath. The standard sets those requirements and the corresponding test methods, together with the marking, packaging, transport and storage of a product that is easily contaminated. It takes effect on 1 November 2024.

This document specifies the product classification, technical requirements, test methods, inspection rules and marking, packaging, transportation and storage of silicon carbide epitaxial wafers, Accompanying documents and order form contents: This document is applicable to epitaxial wafers grown on conductive silicon carbide substrates with homogeneous epitaxial layers of silicon carbide: The product is used to make silicon carbide power Electronic devices:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document: For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document:

GB/T 2828.1-2012 Sampling procedures for inspection by attributes Part 1: Sampling for batch inspection based on acceptance quality limit (AQL) plan

GB/T 6624 Visual inspection method for surface quality of silicon polished wafers

GB/T 14146 Determination of carrier concentration in silicon epitaxial layers - Capacitance-voltage method

GB/T 14264 Terminology of Semiconductor Materials

GB/T 19921 Test method for surface particles of silicon polishing wafers

GB/T 29505 Surface roughness measurement method for flat surfaces of silicon wafers

GB/T 30656 Silicon carbide single crystal polishing sheet

GB/T 32278 Test method for flatness of silicon carbide single crystal wafer

GB/T 39145 Determination of metal element content on silicon wafer surface - Inductively coupled plasma mass spectrometry

GB/T 42902 Test of surface defects of silicon carbide epitaxial wafers - Laser scattering method

GB/T 42905 Test method for thickness of silicon carbide epitaxial layer - infrared reflection method YS/T

28 Wafer Packaging

3 Terms and definitions

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

4 Product Categories

1 Silicon carbide epitaxial wafers are divided into n-type and p-type according to the conductivity type of the epitaxial layer: The carrier element of the n-type epitaxial layer is nitrogen, and the carrier element of the p-type epitaxial layer is nitrogen: The daughter element is aluminum: 4:

2 Silicon carbide epitaxial wafers are divided into types such as 76:2mm, 100:0mm, 150:0mm, and:200:0mm according to their diameters: 4:

3 Silicon carbide epitaxial wafers are divided into 4H and 6H according to their crystal form: