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INTERNATIONAL STANDARD

Semiconductor devices – Non-destructive recognition criteria of defects in silicon carbide homoepitaxial wafer for power devices – Part 4: Procedure for identifying and evaluating defects using a combined method of optical inspection and photoluminescence

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SEMICONDUCTOR DEVICES – NON-DESTRUCTIVE RECOGNITION CRITERIA OF DEFECTS IN SILICON CARBIDE HOMOEPITAXIAL WAFER FOR POWER DEVICES –

Part 4: Procedure for identifying and evaluating defects using a combined method of optical inspection and photoluminescence

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Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

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A list of all parts in the IEC 63068 series, published under the general title *Semiconductor devices – Non-destructive recognition criteria of defects in silicon carbide homoepitaxial wafer for power devices*, can be found on the IEC website.

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- reconfirmed,
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INTRODUCTION

Results of evaluating defects on silicon carbide homoepitaxial wafer by a single test method using optical inspection or photoluminescence often depends on examined wafer conditions such as surface morphology and spatial variation of impurity concentration, and thus need human visual confirmation of the results after inspection using equipment. The procedure described in this part of IEC 63068 uses a combined method of optical inspection and photoluminescence and can yield more accurate and reproducible results of defect recognition compared to when a single test method is used.

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SEMICONDUCTOR DEVICES – NON-DESTRUCTIVE RECOGNITION CRITERIA OF DEFECTS IN SILICON CARBIDE HOMOEPITAXIAL WAFER FOR POWER DEVICES –

Part 4: Procedure for identifying and evaluating defects using a combined method of optical inspection and photoluminescence

1 Scope

This part of IEC 63068 provides a procedure for identifying and evaluating defects in as-grown 4H-SiC (Silicon Carbide) homoepitaxial wafer by systematically combining two test methods of optical inspection and photoluminescence (PL). Additionally, this document exemplifies optical inspection and PL images to enable the detection and categorization of defects in SiC homoepitaxial wafers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 63068-1, *Semiconductor devices – Non-destructive recognition criteria of defects in silicon carbide homoepitaxial wafer for power devices – Part 1: Classification of defects*

IEC 63068-2, *Semiconductor devices – Non-destructive recognition criteria of defects in silicon carbide homoepitaxial wafer for power devices – Part 2: Test method for defects using optical inspection*

IEC 63068-3, *Semiconductor devices – Non-destructive recognition criteria of defects in silicon carbide homoepitaxial wafer for power devices – Part 3: Test method for defects using photoluminescence*

3 Terms and definitions

No terms and definitions are listed in this document.

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- IEC Electropedia: available at https://www.electropedia.org/
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4 Principle

Defects can be more accurately and reproducibly identified by systematically combining two test methods of optical inspection and PL.

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