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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Semiconductor devices – Micro-electromechanical devices – Part 26: Description and measurement methods for micro trench and needle structures

Dispositifs à semiconducteurs – Dispositifs microélectromécaniques – Partie 26: Description et méthodes de mesure pour structures de microtranchées et de microaiguille

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 26: Description and measurement methods for micro trench and needle structures

FOREWORD

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International Standard IEC 62047-26 has been prepared by subcommittee 47F: Microelectromechanical systems, of IEC technical committee 47: Semiconductor devices.

The text of this standard is based on the following documents:

FDIS	Report on voting
47F/233/FDIS	47F/239/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62047 series, published under the general title *Semiconductor devices – Micro-electromechanical devices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,
- replaced by a revised edition, or
- amended.

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 26: Description and measurement methods for micro trench and needle structures

1 Scope

This part of IEC 62047 specifies descriptions of trench structure and needle structure in a micrometer scale. In addition, it provides examples of measurement for the geometry of both structures. For trench structures, this standard applies to structures with a depth of 1 μm to 100 μm; walls and trenches with respective widths of 5 μm to 150 μm; and aspect ratio of 0,006 7 to 20. For needle structures, the standard applies to structures with three or four faces with a height, horizontal width and vertical width of 2 μm or larger, and with dimensions that fit inside a cube with sides of 100 μm.

This standard is applicable to the structural design of MEMS and geometrical evaluation after MEMS processes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

None.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
trench structure
one or more rectangular structures engraved in a planar substrate, with a constant trapezoidal cross section profile

3.2
needle structure
projecting structures with a pointed tip formed of three or more faces, formed on a planar substrate with the plane of symmetry in the vertical plane

3.3
wall and trench
two or more of the trench structures arranged in parallel at regular intervals

3.4
scallop
irregularity formed cyclically in the side walls after a deep-reactive ion etching (DRIE) process with repeated deposition and selective etching of polymeric passivation layer and then etching of a silicon substrate