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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Semiconductor devices – Micro-electromechanical devices – Part 32: Test method for the nonlinear vibration of MEMS resonators

Dispositifs à semiconducteurs – Dispositifs microélectromécaniques – Partie 32: Méthode d'essai pour la vibration non linéaire des résonateurs MEMS

IEC 62047-32:2019-01(en-fr)

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 32: Test method for the nonlinear vibration of MEMS resonators

FOREWORD

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The text of this International Standard is based on the following documents:

FDIS	Report on voting
47F/322/FDIS	47F/325/RVD

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

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

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

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 32: Test method for the nonlinear vibration of MEMS resonators

1 Scope

This part of IEC 62047 specifies the test method and test condition for the nonlinear vibration of MEMS resonators. The statements made in this document apply to the development and manufacture for MEMS resonators.

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 62047-1, *Semiconductor devices – Micro-electromechanical devices – Part 1: Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62047-1 and the following apply.

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
nonlinear vibration
vibration whose displacement has a nonlinear relationship with the elastic restoring force, with the change of the vibration amplitude

3.2
nonlinear jump
jump phenomenon of the frequency response curve when the vibration amplitude exceeds a certain threshold

3.3
frequency deviation
deviation of the vibration frequency of the resonator in a closed-loop system from the natural frequency of the resonator

4 Test parameters of nonlinear vibration of the resonators

Test parameters of nonlinear vibration of the resonators are:

a) amplitude-frequency response of the nonlinear vibration, $A(\omega)$;

b) phase-frequency response of the nonlinear vibration, $P(\omega)$;