

INTERNATIONAL STANDARD



**Semiconductor devices – Micro-electromechanical devices –
Part 29: Electromechanical relaxation test method for freestanding conductive
thin films under room temperature**



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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references	5
3 Terms and symbols	5
3.1 Terms and definitions.....	5
3.2 Symbols and designations	6
4 Test piece	7
4.1 General.....	7
4.2 Shape of a test piece	7
4.3 Measurement of dimensions	7
5 Test principle and test apparatus.....	7
5.1 Test principle	7
5.2 Test environment	7
5.3 Test machine	7
5.4 Test procedure.....	8
5.5 Data analysis	8
6 Test report.....	9
Annex A (informative) Electromechanical relaxation test example of freestanding Au film	10
A.1 Testing overview.....	10
A.2 Testing results	11
Figure 1 – Freestanding test piece.....	6
Figure 2 – Experimental setup	8
Figure A.1 – Photograph of test equipment and a schematic for experimental setup	10
Figure A.2 – Electromechanical relaxation data of freestanding Au film with a thickness of 1 µm	12
Table 1 – Symbols and designations of a test piece.....	6

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –
MICRO-ELECTROMECHANICAL DEVICES –

**Part 29: Electromechanical relaxation test method for freestanding
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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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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 29: Electromechanical relaxation test method for freestanding conductive thin films under room temperature

1 Scope

This part of IEC 62047 specifies a relaxation test method for measuring electromechanical properties of freestanding conductive thin films for micro-electromechanical systems (MEMS) under controlled strain and room temperature. Freestanding thin films of conductive materials are extensively utilized in MEMS, opto-electronics, and flexible/wearable electronics products. Freestanding thin films in the products experience external and internal stresses which could be relaxed even under room temperature during a period of operation, and this relaxation leads to time-dependent variation of electrical performances of the products. This test method is valid for isotropic, homogeneous, and linearly viscoelastic materials.

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 62047-2:2006, *Semiconductor devices – Micro-electromechanical devices – Part 2: Tensile testing method of thin film materials*

IEC 62047-3:2006, *Semiconductor devices – Micro-electromechanical devices – Part 3: Thin film standard test piece for tensile testing*

IEC 62047-8:2011, *Semiconductor devices – Micro-electromechanical devices – Part 8: Strip bending test method for tensile property measurement of thin films*

IEC 62047-21:2014, *Semiconductor devices – Micro-electromechanical devices – Part 21: Test method for Poisson's ratio of thin film MEMS materials*

IEC 62047-22:2014, *Semiconductor devices – Micro-electromechanical devices – Part 22: Electromechanical tensile test method for conductive thin films on flexible substrates*

3 Terms and symbols

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
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