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I.S. EN 62047-22:2014

Semiconductor devices - Micro-electromechanical devices - Part 22: Electromechanical tensile test method for conductive thin films on flexible substrates

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This document is based on:	*Published:*
EN 62047-22:2014	2014-09-26

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
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EN 62047-22

September 2014

ICS 01.080.99

English Version

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

Dispositifs à semiconducteurs - Dispositifs microélectromécaniques - Partie 22: Méthode d'essai de traction électromécanique pour les couches minces conductrices sur des substrats souples (CEI 62047-22:2014)

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Ref. No. EN 62047-22:2014 E

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Foreword

The text of document 47F/186/FDIS, future edition 1 of IEC 62047-22, prepared by SC 47F “Microelectromechanical systems” of IEC/TC 47 “Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62047-22:2014.

The following dates are fixed:

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(normative)

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Publication	Year	Title	EN/HD	Year
IEC 62047-2	2006	Semiconductor devices - Micro-electromechanical devices - Part 2: Tensile testing method of thin film materials	EN 62047-2	2006
IEC 62047-3	2006	Semiconductor devices - Micro-electromechanical devices - Part 3: Thin film standard test piece for tensile testing	EN 62047-3	2006
IEC 62047-8	2011	Semiconductor devices - Micro-electromechanical devices - Part 8: Strip bending test method for tensile property measurement of thin films	EN 62047-8	2011
ISO 527-3	1995	Plastics - Determination of tensile properties - Part-3: Test conditions for films and sheets	EN ISO 527-3	1995

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Edition 1.0 2014-06

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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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IEC 62047-22

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ICS 31.080.99

ISBN 978-2-8322-1649-1

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 22: Electromechanical tensile test method for conductive thin films on flexible substrates

FOREWORD

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

FDIS	Report on voting
47F/186/FDIS	47F/190/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.

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 22: Electromechanical tensile test method for conductive thin films on flexible substrates

1 Scope

This part of IEC 62047 specifies a tensile test method to measure electromechanical properties of conductive thin micro-electromechanical systems (MEMS) materials bonded on non-conductive flexible substrates. Conductive thin-film structures on flexible substrates are extensively utilized in MEMS, consumer products, and flexible electronics. The electrical behaviours of films on flexible substrates differ from those of freestanding films and substrates due to their interfacial interactions. Different combinations of flexible substrates and thin films often lead to various influences on the test results depending on the test conditions and the interfacial adhesion. The desired thickness of a thin MEMS material is 50 times thinner than that of the flexible substrate, whereas all other dimensions are similar to each other.

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.

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*

ISO 527-3:1995, *Plastics – Determination of tensile properties – Part 3: Test conditions for films and sheets*

3 Terms, definitions, symbols and designations

3.1 Terms and definitions

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

3.1.1
gauge factor
G_F
ratio of the change in electrical resistance divided by the original resistance (R_O, resistance in the undeformed configuration) to engineering strain (e)

Note 1 to entry: Gauge factor is expressed as $G_F = (R - R_O)/R_O e$, where R is the electrical resistance in the deformed configuration.

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