
Polprevodniški elementi - Mikroelektromehanski elementi - 13. del: Preskusne metode "upogibaj in reži" za merjenje adhezivne trdnosti struktur MEMS

Semiconductor devices - Microelectromechanical devices - Part 13: Bend- and shear-type test methods of measuring adhesive strength for MEMS structures

Halbleiterbauelemente - Bauelemente der Mikrosystemtechnik - Teil 13: Biege- und Scherprüfverfahren zur Messung der Haftfestigkeit bei MEMS Strukturen

Dispositifs à semiconducteurs - Dispositifs microélectromécaniques - Partie 13: Méthodes d'essais de types courbure et cisaillement de mesure de la résistance d'adhérence pour les structures MEMS

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Ta slovenski standard je istoveten z: EN 62047-13:2012

ICS:

31.080.01	Polprevodniški elementi (naprave) na splošno	Semiconductor devices in general
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SIST EN 62047-13:2012**en**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62047-13

April 2012

ICS 31.080.99

English version

**Semiconductor devices -
Micro-electromechanical devices -
Part 13: Bend- and shear- type test methods of measuring adhesive
strength for MEMS structures
(IEC 62047-13:2012)**

Dispositifs à semiconducteurs -
Dispositifs microélectromécaniques -
Partie 13: Méthodes d'essais de types
courbure et cisaillement de mesure de la
résistance d'adhérence pour les structures
MEMS
(CEI 62047-13:2012)

Halbleiterbauelemente -
Bauelemente der Mikrosystemtechnik -
Teil 13: Biege- und Scherprüfverfahren
zur Messung der Haftfestigkeit bei MEMS-
Strukturen
(IEC 62047-13:2012)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 47F/109/FDIS, future edition 1 of IEC 62047-13, prepared by SC 47F, "Micro-electromechanical systems", of IEC TC 47, "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62047-13:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-01-03
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Annex ZA
(normative)
Normative references to international publications
with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62047-2	2006	Semiconductor devices - Micro-electromechanical devices - Part 2: Tensile testing methods of thin film materials	EN 62047-2	2006

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IEC 62047-13

Edition 1.0 2012-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Semiconductor devices – Micro-electromechanical devices –
Part 13: Bend - and shear - type test methods of measuring adhesive strength
for MEMS structures**

**Dispositifs à semiconducteurs – Dispositifs microélectromécaniques –
Partie 13: Méthodes d'essais de types courbure et cisaillement de mesure de la
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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

P

ICS 31.080.99

ISBN 978-2-88912-937-9

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 13: Bend - and shear - type test methods of measuring adhesive strength for MEMS structures

FOREWORD

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International Standard IEC 62047-13 has been prepared by subcommittee 47F: Micro-electromechanical systems, of IEC technical committee 47: Semiconductor devices.

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

FDIS	Report on voting
47F/109/FDIS	47F/119/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 of 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 web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

Part 13: Bend - and shear - type test methods of measuring adhesive strength for MEMS structures

1 Scope

This part of IEC 62047 specifies the adhesive testing method between micro-sized elements and a substrate using the columnar shape of the specimens. This international standard can be applied to adhesive strength measurement of microstructures, prepared on a substrate, with width and thickness of 1 μm to 1 mm, respectively.

Micro-sized elements of MEMS devices are made up of laminated fine pattern films on a substrate, which are fabricated by deposition, plating, and/or coating with photolithography. MEMS devices include a large number of interfaces between dissimilar materials, at which delamination occasionally occurs during fabrication or in operation. Combination of the materials at the junction determines the adhesive strength; moreover, defects and residual stress in the vicinity of the interface, which are changing by processing condition, strongly affect the adhesive strength. This standard specifies the adhesive testing method for micro-sized-elements in order to optimally select materials and processing conditions for MEMS devices.

This standard does not particularly restrict test piece material, test piece size and performance of the measuring device, since the materials and size of MEMS device components range widely and testing machine for micro-sized materials has not been generalized.

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*

3 Terms and definitions

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

3.1

adhesive bend strength

nominal strength at failure on adhesive joint area by bending mode

3.2

adhesive shear strength

nominal strength at failure on adhesive joint area by shear mode