

# INTERNATIONAL STANDARD



**Semiconductor devices – Micro-electromechanical devices –  
Part 47: Silicon based MEMS fabrication technology – Measurement method of  
bending strength of microstructures**



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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 31.080.99

ISBN 978-2-8322-9556-4

**Warning! Make sure that you obtained this publication from an authorized distributor.**

# CONTENTS

FOREWORD..... 3

1 Scope..... 5

2 Normative references ..... 5

3 Terms and definitions ..... 5

4 Requirements ..... 6

    4.1 In-situ on-chip tester design requirements..... 6

    4.2 In-situ on-chip tester fabrication requirements..... 8

    4.3 Testing environment requirements ..... 8

5 Testing method..... 7

    5.1 General..... 8

    5.2 Microstructure bending strength testing method operation process ..... 8

    5.3 Microstructure bending strength testing method result process ..... 9

6 Test report..... 10

Annex A (informative) Examples of bending strength testing for microstructures ..... 11

    A.1 General..... 11

    A.2 Design dimensions of the testing device ..... 11

    A.3 Microstructures bending strength test ..... 14

Bibliography..... 16

  

Figure 1 – The in-situ on-chip bending strength tester..... 6

Figure 2 – Three-view drawing of the testing structure ..... 7

Figure 3 – Microstructure bending strength testing method operation process ..... 8

Figure 4 – Scheme of the beam of constant strength ..... 9

Figure 5 – Scheme of the magnifying lever ..... 9

Figure 6 – Scheme of the elastic beam ..... 10

Figure A.1 – Overall dimension labeling of the testing device ..... 11

Figure A.2 – Local dimension labeling of the testing device..... 12

Figure A.3 – Design of the deflection ruler and the displacement ruler ..... 13

Figure A.4 – Test area ..... 15

  

Table 1 – Dimensions for testing structure ..... 9

Table A.1 – Design dimensions of the testing device..... 14

Table A.2 – Microstructure bending strength test results ..... 15

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –  
MICRO-ELECTROMECHANICAL DEVICES –

**Part 47: Silicon based MEMS fabrication technology –  
Measurement method of bending strength of microstructures**

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

Draft	Report on voting
47F/474/FDIS	47F/481/RVD

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

The language used for the development of this International Standard is English.

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## SEMICONDUCTOR DEVICES – MICRO-ELECTROMECHANICAL DEVICES –

### Part 47: Silicon based MEMS fabrication technology – Measurement method of bending strength of microstructures

#### 1 Scope

This part of IEC 62047 specifies the requirements and testing method to measure the bending strength of microstructures which are fabricated by micromachining technology used in silicon-based micro-electromechanical system (MEMS).

This document is applicable to the in-situ bending strength measurement of microstructures manufactured by microelectronic technology process and other micromachining technology.

With the devices scaling, the bending strength degradation, induced by defects and contaminations, becomes more severe. This document specifies an in-situ testing method of the bending strength based on MEMS technique. This document does not need intricate instruments (such as scanning probe microscopy and nanoindenter) and special test specimens.

Since in-situ on-chip tester in this document and device are fabricated with the same process on the same wafer, this document can give some practical reference for the design part.

#### 2 Normative references

There are no normative references in this document.

#### 3 Terms and definitions

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

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

- IEC Electropedia, available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

##### 3.1

##### **testing structure**

microstructure (for example, cantilevered or fixed beams) specially made to measure the properties of materials

[SOURCE: IEC 62047-45:2024, 3.1]

##### 3.2

##### **testing device**

microstructure that transmits force or displacement to a testing structure and the force or displacement can be read out at the same time

[SOURCE: IEC 62047-45:2024, 3.2]