

# INTERNATIONAL STANDARD



**Semiconductor devices – Micro-electromechanical devices –  
Part 30: Measurement methods of electro-mechanical conversion characteristics  
of MEMS piezoelectric thin film**



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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Test bed of MEMS piezoelectric thin film .....	6
4.1 General.....	6
4.2 Functional blocks and components .....	8
4.2.1 General .....	8
4.2.2 Clamp.....	8
4.2.3 Linear actuator .....	8
4.2.4 Displacement meter .....	9
4.2.5 Electric measurement instrument.....	9
4.2.6 Power source .....	9
5 Thin film under testing .....	9
5.1 General.....	9
5.2 Measurement principle.....	9
5.3 Measuring procedures of direct transverse piezoelectric coefficient .....	10
5.4 Measuring procedures of converse transverse piezoelectric coefficient.....	10
6 Test report.....	11
Annex A (informative) Example of measuring method of MEMS piezoelectric thin film.....	13
A.1 General.....	13
A.2 Sample preparation procedures .....	13
A.3 Measuring procedures .....	13
A.3.1 Measuring procedures of direct transverse piezoelectric coefficient .....	13
A.3.2 Measuring procedures of converse transverse piezoelectric coefficient.....	15
A.4 Test report .....	18
A.5 Equation of neutral plane .....	19
Bibliography.....	20
Figure 1 – Test bed of direct and converse transverse piezoelectric coefficient of MEMS piezoelectric thin film .....	7
Figure A.1 – Tip displacement and calculated direct transverse piezoelectric coefficient.....	15
Figure A.2 – Input voltage and calculated converse transverse piezoelectric coefficient.....	17
Table 1 – Symbols and designations of test bed .....	8
Table A.1 – Poling treatment conditions .....	14
Table A.2 – Material properties for calculation of direct transverse piezoelectric coefficient .....	14
Table A.3 – Output voltage and calculated transverse piezoelectric coefficient .....	14
Table A.4 – Material properties for calculation of converse transverse piezoelectric coefficient .....	16
Table A.5 – Tip displacement of cantilever and calculated transverse piezoelectric coefficient.....	16

Table A.6 – Example of measuring conditions and results of electro-mechanical characteristics of piezoelectric thin film as mandatory ..... 18

Table A.7 – Example of measuring conditions and results of electro-mechanical characteristics of piezoelectric thin film as optional ..... 19

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –  
MICRO-ELECTROMECHANICAL DEVICES –

**Part 30: Measurement methods of electro-mechanical conversion  
characteristics of MEMS piezoelectric thin film**

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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 30: Measurement methods of electro-mechanical conversion characteristics of MEMS piezoelectric thin film

### 1 Scope

This part of IEC 62047 specifies measuring methods of electro-mechanical conversion characteristics of piezoelectric thin film used for micro sensors and micro actuators, and its reporting schema to determine the characteristic parameters for consumer, industry or any other applications of piezoelectric devices. This document applies to piezoelectric thin films fabricated by MEMS process.

### 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 terminological databases for use in standardization at the following addresses:

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

#### 3.1

##### **unimorph beam**

beam composed of piezoelectric thin film on substrate

#### 3.2

##### **direct transverse piezoelectric coefficient**

transverse piezoelectric coefficient of the piezoelectric thin film calculated from generated charge or voltage caused by strain or stress

#### 3.3

##### **converse transverse piezoelectric coefficient**

transverse piezoelectric coefficient of the piezoelectric thin film calculated from strain or stress caused by electric field or voltage

### 4 Test bed of MEMS piezoelectric thin film

#### 4.1 General

These measuring methods of the transverse piezoelectric properties apply to the unimorph beam. Symbols and designations of test bed are shown in Table 1.