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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 42709.21-2026

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

半导体器件 微电子机械器件 第21部分：MEMS薄膜材料泊松比测试方法
(English Translation)

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1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 21 of GB/T 42709 "Semiconductor Devices - Microelectromechanical Devices". GB/T 42709 has been published as follows.

Part 2.

---Part 2: Tensile Testing Methods for Thin Film Materials;

---Part 3: Standard test pieces for tensile testing of thin films;

---Part 5: Radio Frequency MEMS Switches;

---Part 6: Axial fatigue testing methods for thin film materials;

---Part 7: MEMS Bulk Acoustic Filters and Duplexers for RF Control and Selection;

---Part 8: Bending Test Methods for Measuring the Tensile Properties of Strip Films;

---Part 12: Bending fatigue testing method for thin film materials using MEMS structural resonance method;

---Part 19: Electronic Compass;

- Part 21: Methods for Measuring Poisson's Ratio in MEMS Thin Film Materials;
- Part 22: Electromechanical Tensile Testing Methods for Conductive Thin Films on Flexible Substrates;
- Part 29: Electromechanical relaxation test methods for suspended conductive films at room temperature;
- Part 35: Methods for testing the electrical properties of flexible MEMS devices under bending deformation;
- Part 36: Environmental and Dielectric Permeability Testing Methods for MEMS Piezoelectric Thin Films;
- Part 38: Test Method for Adhesion Strength of Metal Powder Paste in MEMS Interconnects;
- Part 40: Threshold testing method for MEMS inertial shock switches.

"Poisson's ratio test method".

The following minimal editorial changes have been made to this document.

---Correct the dimension symbols in Figure 1b);

---Added a reference to Appendix A.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document was prepared by the National Integrated Circuit Standardization Technical Committee (SAC/TC599) and the National Microelectromechanical Technology Standardization Technical Committee.

(SAC/TC336) are jointly under the jurisdiction of the State Administration of Taxation.

Introduction

This document specifies methods for testing and calculating Poisson's ratio using uniaxial and biaxial loads on thin film materials, applicable to lengths and widths less than [missing information].

MEMS thin film materials with a thickness of less than 10 μm and a diameter of 10 mm. GB/T 42709 "Semiconductor Devices - Microelectromechanical Devices" is proposed to consist of 23...

Partial composition.

---Part 2: Tensile Testing Methods for Thin Film Materials. The purpose is to specify tensile testing methods for MEMS thin film materials.

---Part 3: Standard Test Pieces for Tensile Testing of Thin Films. The purpose is to specify the test pieces for tensile testing of MEMS thin film materials.

Relevant requirements.

---Part 5: Radio Frequency MEMS Switches. The purpose is to define the terminology, definitions, characteristic requirements, and test methods for radio frequency MEMS switches.

---Part 6: Axial Fatigue Testing Methods for Thin Film Materials. The purpose is to specify axial fatigue testing methods for MEMS thin film materials.

method.

---Part 7: MEMS Bulk Acoustic Filters and Duplexers for RF Control and Selection. The purpose is to specify MEMS bulk acoustic filters and duplexers.

Terminology, definitions, characteristic requirements, and test methods for acoustic resonators, filters, and duplexers.

---Part 8: Bending Test Method for Measuring the Tensile Properties of Strip Films. The purpose is to specify the method for measuring the tensile properties of strip films.

A bending test method for sexuality.

---Part 9: Measurement of inter-wafer bonding strength. The purpose is to specify the testing methods for the bonding strength of MEMS wafers.

---Part 11: Test method for the linear thermal expansion coefficient of materials in suspended microelectromechanical systems. The purpose is to specify the linear thermal expansion coefficient of materials in suspended microelectromechanical systems.

Method for testing the linear thermal expansion coefficient of MEMS materials.

---Part 12: Bending Fatigue Testing Method for Thin Film Materials Using MEMS Structural Resonance. The purpose is to specify the testing methods for MEMS thin film materials.

Methods for testing the bending fatigue of membrane materials.

---Part 13: Bending and Shear Test Methods for the Adhesion Strength of MEMS Structures. The purpose is to specify the adhesion strength of MEMS structures.

Strength test method.

---Part 16: Test methods for residual stress in MEMS films using wafer curvature and cantilever beam deflection. The purpose is to specify the testing methods for MEMS films.

Two test methods were used. residual stress wafer curvature and cantilever beam