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

GB/T 26113-2010

**Micro-electromechanical system (MEMS) technology - General
rules for the assessment of micro-geometrical parameters**

微机电系统 (MEMS) 技术 微几何量评定总则

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. This standard by the National MEMS Technology Standardization Technical Committee (SAC/TC336) and focal points. This standard is mainly drafted by: The machine Productivity Promotion Center, Xi'an Jiaotong University, Tianjin University, Zhongyuan University of Technology. The main drafters of this standard. Ding Hongyu, Zhang Ping, Liu Wei, Jiang Zhuang Germany, King Xuan Wei, Hu Xiaodong, Zhao Zexiang. Micro-electromechanical systems (MEMS) technology Micro Geometrical assessment - General

1 Scope

China's national general rules for assessing the micro-geometrical parameters of micro-electromechanical systems. It specifies the terms, the principles, the measurement conditions and the evaluation rules for dimensions, form, surface texture and related geometrical quantities at the micrometre scale. Measuring a MEMS device is not measuring a small machine part. The dimensional metrology of engineering was built for objects a hand can hold and an instrument can touch, and almost all of its assumptions fail at these scales. A contact probe deforms or destroys a structure whose beams are a few micrometres thick, so measurement is optical or by scanning probe, and each of those methods has its own systematic errors, its own dependence on the surface's optical properties, and its own definition of where the surface actually is. The features being measured are produced by lithography and etching, not by cutting, so the shapes are sidewalls with an angle, undercuts, and edges whose roundness is comparable with the tolerance - and the classical definitions of a diameter or a flatness do not map onto them cleanly. And the parts are not rigid at the measuring force or free of the substrate they were fabricated on, so the reference from which anything is measured has to be defined rather than assumed. That is what a general rules standard is for: it fixes the terminology, states which parameters are meaningful at this scale and how each is defined, sets the environmental and instrument conditions under which a measurement is valid, and prescribes how the uncertainty is stated. Without it two laboratories measuring the same device report different numbers and both are defensible. Issued on 10 January 2011 and in force since 1 October 2011.

This standard specifies the basic principles of assessment of the amount of the micro-geometry, elements of assessment, assessment procedures, evaluation methods and assessment rules. This standard applies to enterprises, research institutions, testing institutions engaged in MEMS technology and product research, design, production and testing.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the edition are not applicable to the present file. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 3505 Geometrical product specifications (GPS) Surface texture Profile method - Terms, definitions and surface texture parameters

GB/T 18779.2 Geometrical Product Specifications (GPS) - Inspection by measurement of workpieces and measuring equipment - Part 2. measuring equipment Calibration and product testing in GPS measurements Uncertainty Evaluation Guide

GB/T 26111 micro-electromechanical systems (MEMS) technology terms

3 Terms and Definitions

Terms and definitions in GB/T 3505 and GB/T 26111 and given the following terms and definitions apply to this document.

3.1 Micro geometric elements micro-geometricalfeature Dots microstructure geometric features basic, line, surface.

3.2 Micro-geometry micro-geometricalparameter Geometric parameters of MEMS components.

3.3 Dimensional characteristics featureofsize By a certain size of linear or angular dimensions sizing geometry.

3.4 Surface structure surfacestructure Geometric repetitive or accidental deviation surface, these deviations form a three dimensional topography of the surface.

3.5 Surface (structural) parameter surface (structure) parameter Surface micro-geometry parameters representing characteristics.

3.6 Shape Feature characteristicofform The actual shape of the single elements of the whole amount of variation allowed. * * *