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

GB/T 2423.56-2023

Replacing GB/T 2423.56-2018

**Environmental testing - Part 2: Test methods - Test Fh:
Vibration, broadband random and guidance**

环境试验 第2部分：试验方法 试验Fh：宽带随机振动和导则

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Foreword

This document is drafted in accordance with the rules provided in GB/T 1.1-2020 Directives for standardization - Part

1. Rules for the structure and drafting of standardizing documents. This document is part 56 of GB/T 2423. See Annex NA for the published parts of GB/T 2423. This document replaces GB/T 2423.56-2018 Environmental testing - Part

2. Test methods - Test Fh. Vibration, broadband random and guidance. Compared with GB/T 2423.56-2018, except for structural adjustments and editorial changes, the main technical changes are as follows:

- a) Add the term "kurtosis" (see 3.39);
- b) Add the term "skewness" (see 3.40);
- c) Add the term "beta distribution" and "Figure 4" (see 3.41);
- d) Add relevant provisions for "parameters determined during non-Gaussian vibration testing" (see Clause 5);
- e) Add "For non-Gaussian vibration testing, the time history shall be recorded and the kurtosis, skewness (if applicable) and amplitude probability density shall be established as required by the relevant specification" and "Figure 5" (see 8.4.1). This document is identical to IEC 60068-2-64.2019 Environmental testing - Part 2-64. Test - Test Fh. Vibration, broadband random and guidance. This document makes the following minimal editorial changes.

- a) In order to coordinate with the existing standards, change the standard name to Environmental testing - Part

2. Test methods - Test Fh. Vibration, broadband random and guidance;

- b) Add Annex NA. Please note that some of the contents of this document may involve patents. The issuing organization of this document is not responsible for identifying patents. This document was proposed and managed by the National Technical Committee on Environmental Conditions of Electric and Electronic Products and Environmental Test of Standardization Administration of China (SAC/TC 8). Drafting organizations of this document. Guangzhou University, The Fifth Institute of Electronics, Ministry of Industry and Information Technology, Beijing University of Aeronautics and Astronautics, Shanghai Institute of Quality Inspection and Technical Research, Suzhou Sushi Testing Group CO., LTD., Zhongyuan Mechanical Instruments Ltd., China Aviation Technology Research Institute, Guangdong Labtone Testing Equipment Co., Ltd., Guangzhou Ceprei Information Technology Co., Ltd., Suzhou Xinke Testing Technology Co., Ltd. Main drafters of this document. Xu Zhonggen, Ji Chunyang, Chen Bochen, Wu Sa, Guo Xuan, Liu Fangfei, Xu

Yi, Huang Xiaoguang, Zhang Yue, Sun Jianyong, Yang Guofu, Wang Miao, Wu Huan. This document was first published in 2006, and first revised in 2018. This is the second revision.

1 Scope

GB/T 2423.56 specifies Test Fh, broadband random vibration. Sinusoidal vibration testing sweeps one frequency at a time and finds resonances; random vibration excites the whole band at once, which is what actually happens to a product in a vehicle, an aircraft or a shipping container, and it excites several resonances simultaneously in a way a sine sweep never does. That is why random has become the default for transport and service vibration and why this test appears in so many product specifications. The standard specifies the test: the severities and how a power spectral density profile is defined and tolerated, the requirements on the vibration generator and the control system and on the number and placement of control accelerometers, the control strategy and the tolerance on the achieved spectrum, the mounting of the specimen, the preconditioning, the initial and final measurements and functional checks, the duration and its relationship to the intended service life, and the reporting, together with substantial guidance on selecting a severity. It is aligned with IEC 60068-2-64. The 2023 edition replaces GB/T 2423.56-2018.

This document demonstrates the adequacy of specimens to resist dynamic loads without unacceptable degradation of its functional and/or structural integrity when subjected to the specified random vibration test requirements.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2041, Vibration and shock - Vocabulary

GB/T 2298-2010, Mechanical vibration, shock and condition monitoring - Vocabulary (ISO 2041.2009, IDT)

IEC 60050-300, International Electrotechnical Vocabulary - Electrical and electronic measurements and measuring instruments - Part 311: General terms relating to measurements - Part 312: General terms relating to electrical measurements - Part 313. Types of electrical measuring instruments - Part 314: Specific terms according to the type of instrument

GB/T 2421-2020, Environmental testing - General and guidance (IEC 60068- 1.2013, IDT)

GB/T 2423.10-2019, Environmental testing - Part

3 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in IEC 60050-300, IEC 60068-1, IEC 60068-2-6, IEC 60068-5-2 and ISO 2041, apply.

3.1 cross-axis motion motion not in the direction of the stimulus; generally specified in the two axes orthogonal to the direction of the stimulus

3.2 actual motion motion represented by the wideband signal returned from the reference point transducer

4 Requirements for test apparatus

4.1 General The required characteristics apply to the complete vibration system, which includes the power amplifier, vibrator, test fixture, specimen and control system when loaded for testing.

5 Severities

The test specifies an acceleration spectral density curve with increasing, decreasing and flat horizontal portions.

6 Preconditioning

If the relevant specification calls for preconditioning it shall then prescribe the conditions.

7 Initial measurements and functional performance test

The specimen shall be submitted to visual, dimensional and functional and any other checks as prescribed by the relevant specification.