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

GB/T 2423.64-2023

**Environmental testing - Part 2: Test methods - Test Fj: Vibration
- Long time history replication**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 64 of GB/T 2423. The published parts of GB/T 2423 are shown in Appendix NA.

This document is equivalent to IEC 60068-2-85:2019 "Environmental Testing Part 2-85. Test Method Test Fj. Vibration Long Time History

Process Reappearance".

This document has made the following minimal editorial changes.

a) In order to coordinate with the existing standards, the name of the standard is changed to "Environmental Testing Part 2. Test Method Test Fj. Vibration for a long time

"Reappearance of the Process";

b) Added informative appendix NA "Constituting Documents of GB/T 2423".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Vibration environment is the most basic and common mechanical environment. Depending on the characteristics of the vibration environment, GB/T 2423 "Environmental Test No.

Part 2. Test Methods" series of standards provide a variety of vibration test methods, such as GB/T 2423.10 [Test Fc. Vibration (Sinusoidal)] for

Periodic vibration of longer duration, GB/T 2423.48 (Test Ff. Vibration time history and sinusoidal beat frequency method) is for shorter duration

Transient vibration, GB/T 2423.56 (Test Fh. Broadband Random Vibration and Guidelines) is aimed at steady-state random vibration of longer duration,

GB/T 2423.58 (Test Method Test Fi. Vibration Mixed Mode) is aimed at superimposing sinusoidal or narrowband random on a broadband random background.

mixed vibration signal. Their use is generally recommended when the dynamic vibration environment to which the sample is subjected can be covered by these test methods. about how

To estimate the dynamic vibration environment of the sample and select the appropriate test method based on this, please refer to GB/T 2424.26 "Electrical and Electronic Products Environmental Protection

Environmental Testing Part 3. Supporting Documents and Guidelines for Vibration Test Selection.

When components, equipment and other products are likely to experience vibrations of a nature that cannot be covered by the above vibration test methods, this specification

The document presents a method for digitally controlled vibration testing based on a defined time history, which should be of long duration.

time. Compared with most other vibration test methods, the test method given in this document is by specifying a definite time domain history signal.

to define vibration requirements, so that when formulating relevant specifications, vibration conditions can be stipulated more flexibly according to specific situations, and in addition to testing

Apart from the technical limitations of the test equipment, there are almost no restrictions on the vibration characteristics. Because of this, it is difficult to give a test severity level in a single form

and tolerance requirements. Conducting long-term history reproduction testing always requires a high degree of engineering judgment on the part of users and specifiers, and requires

The specification preparer selects test procedures, test time histories and severity levels, tolerances, and analyzes appropriate to the sample and its intended use.

method.

Environmental testing Part 2. Test methods

Test Fj. Reproduction of long-term vibration history

1 Scope

The vibration test methods provided in this document are used to verify that the sample is subjected to a time history (long time history reproduction) to define the test requirements.

The ability to withstand dynamic loads without unacceptable functional and/or structural integrity degradation during specified vibration tests. these times

The history can be from actual measurement records or artificially generated. For both cases, this test method is performed for very specific applications

Experimental tailoring offers the possibility.

A typical application of this method is when the motion characteristics of the transient deterministic vibration, periodic vibration or random vibration test required are very specific.

In particular, other test standards cannot cover situations, including the inability to use the classic impact of IEC 60068-2-27 or the impact of IEC 60068-2-81.

Shock response spectrum, or periodic sinusoidal vibration according to IEC 60068-2-6, or Gaussian or non-Gaussian (kurtosis) broadband random according to IEC 60068-2-64

vibration to fully characterize the time history. Of course, users also understand that the time history used to reproduce a long-term history is deterministic, and any

The simulation of a random vibration is approximated using quasi-randomness.

In addition, this test method may be mixed with other methods in order to produce a time history that can characterize the desired signal. In this case

The next test will be very complicated.

The purpose of this test is different from IEC 60068-2-57. The purpose of IEC 60068-2-57 is mainly to use the synthetic time history to analyze transient vibration

Move to evaluate. The long-term history reproduction test mainly uses the actual time history measured in the real environment to conduct durability tests and functional tests.

Can test. It can also be used as a way to simulate non-Gaussian time histories.

This document is intended for use with samples that experience vibrations of very specific nature during transportation or use, such as aircraft, spacecraft or ground vehicles.

products in the vehicle. It is mainly used for samples without packaging, as well as samples with transport packaging, whose packaging is part of the sample itself.

Of course, for samples with packaging, the sample is regarded as a product, and the sample and its packaging are regarded as a sample. For packaged products

For product testing, this document is used in conjunction with GB/T 2423.43-2008.

Although this document mainly applies to electrical and electronic products, it is not limited to this and also applies to products in other fields (see Appendix A).

This document applies to single-axis excitation.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

IEC 60068-2-6 Environmental testing Part 2-6. Test method Test Fc. Vibration (sinusoidal) [Environmental

Note. GB/T 2423.10-2019 Environmental testing Part 2. Test method Test Fc. Vibration (sinusoidal) (IEC 60068-2-6.2007, IDT)

IEC 60068-2-47 Environmental testing Part 2-47. Test methods Installation of test pieces for vibration, impact and similar dynamic tests

dynamic tests)

Note. GB/T 2423.43-2008 Environmental testing of electrical and electronic products Part 2. Test methods Safety of vibration, impact and similar dynamic test samples

Installation (IEC 60068-2-47.2005, IDT)

IEC 60068-2-64 Environmental testing Part 2-64. Test methods Test Fh. Broadband random vibration and guidelines (Environ-