www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

Translated English of Chinese Standard: GB/T13166-2018

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 17.220

L 85

GB/T 13166-2018

Replacing GB/T 13166-1991

Design Margin and Abuse Tests for Electronic Measuring Instrument

电子测量仪器设计余量与模拟误用试验

Issued on: June 07, 2018 **Implemented on: January 01, 2019**

Issued by: State Administration for Market Regulation;
Standardization Administration of PRC.

www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

Table of Contents

www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 13166-1991 *Design Margin and Abuse Tests for Electronic Measuring Instruments.*

Compared with GB/T 13166-1991, this Standard has the major technical changes as follows besides the editorial modifications:

--- Delete Test Objective (see Clause 2 of Edition 1991);

--- Add Normative References (see Clause 2 of this Edition);

--- Delete Test Requirements (see Clause 3 of Edition 1991);

--- Add Terms and Definitions (see Clause 3 of this Edition);

--- Delete Program (see Clause 4 of Edition 1991);

--- Increase the three-level indicator of the instrument (see 4.1.1 of this Edition);

--- Increase the design margin contents of the instrument (see 4.1.2 of this Edition);

--- Increase the parameter and indicator determination of the instrument (see 4.1.3 of this Edition);

--- Increase the margin design solution of the instrument (see 4.2 of this Edition);

--- Increase the software engineering design (see 4.2.4 of this Edition);

--- Increase the design verification (see 4.3 of this Edition);

--- Increase the Abuse (see Clause 5 of this Edition);

--- Add informative appendixes of “Example of Design Margin Test” and “Examples of Abuse and Preventive Measures” (see Appendix A and B of this Edition).

Please note some contents of this document may involve patents. The issuing organization of this document shall not assume the responsibility to identify these patents.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Electronic Measuring Instrument (SAC/TC 153).

Drafting organizations of this Standard: Institute of Electronic Industry Standardization for Ministry of Industry and Information Technology; Comprehensive Inspection &

www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

Design Margin and Abuse Tests for Electronic Measuring Instrument

1 Scope

This Standard specifies the design margin and abuse test that shall be carried out during the design of new electronic measuring instruments (hereinafter referred to as instrument).

This Standard is applicable to the electronic measuring instruments in all environmental groups.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB 4824 Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment - Electromagnetic Disturbance Characteristics - Limits and Methods of Measurement

GB/T 6587 General Specification for Electronic Measuring Instruments

GB/T 17626.2 Electromagnetic Compatibility - Testing and Measurement Techniques -Electrostatic Discharge Immunity Test

GB/T 17626.3 Electromagnetic Compatibility - Testing and Measurement Techniques – Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

GB/T 17626.4 Electromagnetic Compatibility - Testing and Measurement Techniques -Electrical Fast Transient/Burst Immunity Test

GB/T 17626.6 Electromagnetic Compatibility - Testing and Measurement Techniques - Immunity to Conducted Disturbances Induced by Radio-Frequency Fields

www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

4.2.1 Component derating design

Reduce the temperature stress and electrical stress that the component is subjected to in the circuit. The optimal derating shall be at or below the area near the inflection point of the reliability curve corresponding to the electrical stress and temperature stress; determine the derating level according to the different applications of the product. The derating shall not only consider the steady state, but also the transient overload and dynamic electrical stress that may occur in the circuit.

4.2.2 Derating design for mechanical and structural components

Find the best match between stress and strength; obtain the expected design values; so that the instrument can obtain best effects in the terms of weight, cost and material availability when the instrument meets stress and strength requirements.

4.2.3 Environmental adaptability design

The environmental adaptability design shall meet the requirements of internal control indicators from the developer, at least including high/low temperature design, vibration/impact design, electromagnetic compatibility design.

4.2.4 Software engineering design

The developer shall carry out the software engineering design.

4.2.5 Redundant design

The redundancy shall be designed in the following cases:

a) When required by the user;

b) When the user does not require; but the reliability of the product is still not met by other applied technologies (such as derating, simplifying the circuit, and applying more reliable components, etc.).

4.3 Design verification

4.3.1 General

It is used for the early failure due to the defects of components, processes and design or other causes; the instrument shall be tested repeatedly according to the margin design requirements; so that obtain the working limit of the product, and discover the potential weak links and components in the design phase. See Appendix A for Examples of Design Margin Tests.

4.3.2 High/Low temperature test

www.ChineseStandard.net --> Buy True-PDF --> Auto-delivered in 0~10 minutes.

the requirements of internal control indicators; while the electrostatic discharge immunity test shall, according to the provisions of GB/T 17626.2, improve one test level for each test till meets the requirements of internal control indicators.

5 Abuse

5.1 Identification and analysis of abuse

The abuse shall be predicted; identify and analyze the instrument performance degradation, instrument damage or personal injury due to the human error. The analytical procedures are as follows:

a) Record and analyze system failure; handle one failure at a time;

b) List and analyze the human operation relevant to each failure;

c) Classify and estimate the corresponding error probability.

5.2 Abuse type

The abuse type that may occur during the installation, use and handling of the instrument; including missing necessary operating procedures, increasing the redundant operating procedures, and reversing the operating sequence, etc. The following are typical examples; but not limited to the following examples; thereof, a) ~ f) abuse type that may result from improper installation; g) ~ o) abuse type that may occur due to improper use; p) ~ s) abuse type that may be caused by improper handling and storage.

a) Work in a narrow space such as cabinet; there is no proper exhaust ventilation;

b) The input signal is inconsistent with the signal specified by the signal terminal;

c) The power supply is poorly grounded or the wiring is incorrect;

d) Access to the wrong power supply;

e) Fail to take the anti-static measures;

f) Wrong connection of cable or adapter;

g) The input signal power of the instrument input port is greater than the maximum safe input power;

h) Input a large DC signal at the input and output port of the instrument;

i) Delete the exit-factory data file;

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. https://www.ChineseStandard.us

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. https://www.ChineseStandard.net

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - https://www.ChineseStandard.us).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading…): https://www.chinesestandard.net/AboutUs.aspx

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: https://www.linkedin.com/in/waynezhengwenrui/

------ The End ------