

Translated English of Chinese Standard: GB/T40309-2021
www.ChineseStandard.net → Buy True-PDF → Auto-delivery.
Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 33.100

CCS L 06

GB/T 40309-2021

**Electrical Self-balancing Vehicle - Electromagnetic
Compatibility - Emission and Immunity Requirements**

电动平衡车 电磁兼容 发射和抗扰度要求

Issued on: August 20, 2021

Implemented on: March 1, 2022

Issued by: State Administration for Market Regulation;

**Standardization Administration of the People's Republic of
China.**

Table of Contents

Foreword.....	3
1 Scope.....	4
2 Normative References	4
3 Terms and Definitions	5
4 General Requirements	7
4.1 Operating Modes.....	7
4.2 Test Items	7
4.3 Test Configuration	7
4.4 Test Environment.....	8
5 Emission	8
5.1 Conducted Emission	8
5.2 Radiated Emission	11
5.3 Harmonic Current, Voltage Fluctuations and Flicker	13
6 Immunity	13
6.1 Performance Criteria	13
6.2 Requirements and Tests.....	14
7 Test Report.....	17
Appendix A (informative) Common Functions and Performance Degradation Phenomena of Immunity	19
Bibliography	20

Electrical Self-balancing Vehicle - Electromagnetic Compatibility - Emission and Immunity Requirements

1 Scope

This document specifies the general requirements, emission and immunity requirements, as well as test methods and test report requirements for the electromagnetic compatibility of electrical self-balancing vehicle.

This document is applicable to electrical self-balancing vehicle with storage battery as the power source.

This document does not apply to electrical self-balancing vehicle for military and other special purposes.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 4365-2003 Electrotechnical Terminology - Electromagnetic Compatibility

GB/T 6113.104 Radio Disturbance and Immunity Measuring Apparatus and Methods - Part 1-4: Radio Disturbance and Immunity Measuring Apparatus - Radiated Disturbance Measuring Antenna and Test Site

GB/T 6113.201 Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods - Part 2-1: Methods of Measurement of Disturbances and Immunity - Conducted Disturbance Measurements

GB/T 6113.203 Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods - Part 2-3: Methods of Measurement of Disturbances and Immunity - Radiated Disturbance Measurements

GB 17625.1 Electromagnetic Compatibility - Limits - Limits for Harmonic Current Emissions (equipment input current ≤ 16 A per phase)

GB/T 17625.2 Electromagnetic Compatibility (EMC) - Limits - Limitation of Voltage Changes, Voltage Fluctuations and Flicker in Public Low-voltage Supply Systems, for

functions cannot be simultaneously configured, then, they need to be separately tested. During the emission measurement, under the typical application and actual installation conditions specified by the manufacturer, the electrical self-balancing vehicle shall be measured under the operating state that generates the greatest disturbance at the measurement frequency.

If the electrical self-balancing vehicle has auxiliary equipment, then, the electrical self-balancing vehicle shall be connected to the least number and representative auxiliary equipment of the application port during the operation test.

If the manufacturer requires external filtering and / or shielding devices or has prescribed measures in accordance with the user manual, then, the test in this document shall be carried out with the prescribed devices and measures, and the specific devices and measures shall be clarified in the test report.

4.4 Test Environment

The tests shall be carried out in a designated environment, so as to ensure the correct operation of the EUT. The following shall be adopted:

- a) Ambient temperature: 15 °C ~ 35 °C;
- b) For the electrostatic discharge immunity test, the relative humidity range is 30% ~ 60%; for other tests, the relative humidity is not greater than 75%;
- c) Air pressure: 86 kPa ~ 106 kPa;
- d) For the site of the radiated emission measurement, the requirements for semi-anechoic chamber or open test field shall comply with the stipulations of GB/T 6113.104.

If the electrical self-balancing vehicle cannot normally function under the above-mentioned environmental conditions, it may be tested in accordance with the operating environment required by the manufacturer, and the environmental conditions of the actual operation shall be recorded in the test report.

5 Emission

5.1 Conducted Emission

5.1.1 Requirements for conducted emission

The electrical self-balancing vehicle shall:

- a) Simultaneously satisfy the specified average value limit when using the average reading detector for measurement and the specified quasi-peak limit

GHz;

---If the highest internal operating frequency of the electrical self-balancing vehicle is 108 MHz ~ 500 MHz, then, the measurement shall only be carried out to 2 GHz;

---If the highest internal operating frequency of the electrical self-balancing vehicle is 500 MHz ~ 1 GHz, then, the measurement shall only be carried out to 5 GHz;

---If the highest internal operating frequency of the electrical self-balancing vehicle is higher than 1 GHz, then, the measurement shall be carried out to 5 times of the highest frequency or 6 GHz, whichever is smaller.

5.3 Harmonic Current, Voltage Fluctuations and Flicker

For the electrical self-balancing vehicle with an input current not greater than 16 A, the harmonic current emission shall comply with the requirements of GB 17625.1.

For the electrical self-balancing vehicle with a rated current not greater than 16 A, the voltage fluctuation and flicker limits shall comply with the requirements of GB/T 17625.2.

6 Immunity

6.1 Performance Criteria

6.1.1 Overview

During and after the immunity test in accordance with the stipulations of 6.2, the compliance determination (see Table 5 ~ Table 7) shall be performed in accordance with the different performance criteria in 6.1.2 ~ 6.1.4, and the details shall be recorded in the test report.

During the formulation of the test scheme, the manufacturer shall provide necessary functional descriptions of the electrical self-balancing vehicle published in public prints and supplement the detailed performance criterion index requirements during and after the immunity test.

Examples of some of the functions specified by the manufacturer and evaluated during the test are as follows, but not limited to:

---mobile function;

---meter display;

---power supply;

---communication function.

During and after the immunity test of the electrical self-balancing vehicle, the common functions and performance degradation phenomena are shown in Appendix A.

6.1.2 Performance criterion A

During and after the test, without operator intervention, the EUT shall be able to continuously work as expected. When the equipment is used as expected, no degradation or functional loss below the minimum performance level specified by the manufacturer is allowed. The allowable performance degradation may be used in place of the performance level. If the manufacturer does not specify the minimum performance level or the allowable performance degradation, then, it may be obtained from the product's instruction manual or technical documents. In addition, the user has reason to require the used equipment to reach this stipulation.

6.1.3 Performance criterion B

After the test, without operator intervention, the EUT shall be able to continue to work as expected. When the equipment is used as expected, after the harassment is applied, no degradation or functional loss below the performance level specified by the manufacturer is allowed. The allowable performance degradation may be used in place of the performance level.

During the test, performance degradation is allowed, but after the test, the operating state shall not be changed, and the stored data shall not be lost.

If the manufacturer does not specify the minimum performance level (or the allowable performance loss), then, it may be obtained from the product's instruction manual or technical documents. In addition, the user has reason to require the used equipment to reach this stipulation.

6.1.4 Performance criterion C

During and after the test, a temporary loss of function is allowed, and the function can be restored by itself, or in accordance with the manufacturer's instructions, the user can restore it through the controller operation or re-powered EUT.

The functions and / or information stored in the non-volatile memory or protected by the backup battery shall not be lost.

6.2 Requirements and Tests

6.2.1 Overview

The equipment immunity requirements and tests involved in this document are provided one by one by ports (enclosure port, signal port and power port).

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 -----