

ICS 31.080.99
CCS L 40



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

GB/T 20521.2-2025

**Semiconductor devices - Part 14-2: Semiconductor sensors -
Hall elements**

半导体器件 第14-2部分：半导体传感器 霍尔元件

(English Translation)

Issued on: December 2, 2025

Implemented on: July 1, 2026

Issued by: State Administration for Market Regulation

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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 14-2 of GB/T 20521 "Semiconductor Devices". GB/T 20521 has already published the following parts.

---Part 14-1.General Principles and Classification of Semiconductor Sensors (GB/T 20521-2006);

---Part 14-3.Semiconductor Sensors - Pressure Sensors (GB/T 20522-2006);

---Part 14-5.Semiconductor Sensors PN Junction Semiconductor Temperature Sensor

(GB/T 20521.5-2025).

This document is modified to adopt IEC 60747-14-2:2000 "Semiconductor devices - Part 14-2.Hall elements for semiconductor sensors".

Compared with IEC 60747-14-2:2000, this document has undergone many structural adjustments. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table of contents.

The technical differences between this document and IEC 60719-14-2:2000, and the reasons therefor, are as follows.

---The definition of "semiconductor Hall element" has been changed to suit my country's technological conditions (see 3.1).

The following editorial changes have been made to this document.

---The notes column in Table 1 has been deleted;

---The formula numbering has been edited, and the meanings of the symbols in the formulas have been supplemented;

---Appendix A (information) has been added.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Semiconductor Device Standardization Technical Committee (SAC/TC78).

Introduction

Semiconductor sensors are fundamental products in the electronics industry chain, widely used in smart cars, industrial manufacturing, consumer electronics, and medical devices.

Applications include healthcare and other fields. GB/T 20521 "Semiconductor Devices" is proposed to consist of eight parts.

---Part 14-1.Semiconductor Sensors - General Specification. This section aims to define the basic requirements for various types of semiconductor sensors.

---Part 14-2.Semiconductor Sensor Hall Elements. The purpose is to specify the relevant requirements for semiconductor Hall elements.

---Part 14-3.Semiconductor Pressure Sensors. This section specifies the requirements for

semiconductor pressure sensors.

---Part 14-4.Semiconductor Sensors - Semiconductor Accelerometers. The purpose is to specify the relevant requirements for semiconductor accelerometers.

---Part 14-5.Semiconductor Sensors PN Junction Semiconductor Temperature Sensors. The purpose is to specify the temperature transmission characteristics of semiconductor PN junctions.

Requirements related to sensors.

---Part 14-10.Performance Evaluation Methods for Wearable Glucose Sensors. The aim is to specify the performance evaluation methods for wearable glucose sensors.

Performance evaluation method for glucose sensors.

---Parts 14-11.Semiconductor Sensors for Measuring Ultraviolet Light, Light, and Temperature. Surface Acoustic Wave-Based Integrated Sensors Test methods. The aim is to specify the performance of integrated surface acoustic wave-based sensors used to measure ultraviolet light, ambient light, and temperature.

Test method.

---Parts 14-12.Performance testing methods for semiconductor sensors based on CMOS imaging gas sensors. The aim is to regulate...

This document defines a performance testing method for CMOS imaging-based gas sensors, including terminology and definitions, test environment conditions, and test system.

Test methods and test reports.

semiconductor devices Part 14-2.Hall Elements in Semiconductor Sensors

1 Scope

This document specifies the requirements for packaged semiconductor Hall elements that utilize the Hall effect.

This document applies to packaged semiconductor Hall elements that utilize the Hall effect.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

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

This document.

GB/T 17573-1998 Semiconductor devices-Discrete devices and integrated circuits-Part 1: General principles (IEC 60747-1:1983, IDT) IEC 61340-5-1:2016 Electrostatics - Part 5-1.General requirements for protection against electrostatic phenomena in electronic devices

3 Terms and Definitions

The following terms and definitions apply to this document.

A semiconductor device that generates a voltage when subjected to a magnetic field of varying magnetic flux density. The generated voltage is proportional to the control voltage and the magnetic flux density.

Directly proportional.

Note: The definition of control voltage is given in 3.4.

Hall mobility

Electron mobility measured based on the Hall effect.

control current

A constant current is applied to the input terminal of the component when the output terminal is unloaded.

control voltage

A constant voltage is applied to the input terminal of the component when the output terminal is unloaded.

offset voltage

residual voltage

The voltage generated at the output terminal when a specified voltage (current) is applied to the input terminal of a component without a magnetic field.