ICS 17.220.20
CCS L 15

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47563-2026

Micro-electromechanical systems (MEMS) technology - Technical specification for MEMS magnetic field sensors

微机电系统（MEMS）技术 MEMS磁场传感器技术规范

Issued on: April 30, 2026 **Implemented on: August 1, 2026**

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

Table of Contents

Foreword

The symbol names and units are shown in Table

1.The symbol names and units in Table 1 are applicable to this document.

5.1 Direction of the magnetic sensing axis MEMS magnetic field sensors (hereinafter referred to as "sensors") can be classified according to the direction of the magnetic sensing axis as follows:

5.2 Principle Sensors can be classified according to their operating principle as follows:

b) Reluctance type;

c) Magnetoelectric coupling type;

d) Giant magnetoresistance type;

e) Fluxgate type;

5.3 Types of Magnetic Fields Measured Sensors can be classified according to the type of magnetic field they measure.

a) Constant formula;

b) Alternating pattern.

5.4 Output Signal Type Sensors can be classified according to the type of output signal.

6.1.1 Appearance and Marking

6.1.1.1 The sensor should be in good condition, without any damage or defects, and its structure should be robust; the markings should be clear and complete. The marking information should include at least... include.

a) Model number;

b) Traceability code (or batch number);

c) Pin markings.

6.1.1.2 The identification information should preferably include.

b) Manufacturer's name;

c) Direction of the magnetic sensing axis;

d) The center of the sensitive area.

6.1.1.3 The identification information should be consistent with the description in the device manual.

6.1.2 Temperature Range The sensor's maximum operating temperature range is -55°C to 125°C, and its maximum storage temperature range is -65°C to.200°C. If any of these ranges are exceeded... The specific temperature range requirements mentioned above should be clearly specified in the product's detailed specifications. The upper and lower limits of the operating temperature range and storage temperature range should be given in the device datasheet, with the lower limit preferably selected from the following temperature values. Select the following temperatures. -65°C, -55°C, -50°C, -43°C, -40°C, -33°C, -25°C, -20°C, -10°C, -5°C, 5°C. Upper limit. The values should preferably be selected from the following temperature ranges. 30°C, 35°C, 40°C, 45°C, 50°C, 55°C, 60°C, 65°C, 70°C, 85°C, 100°C. 125°C, 155°C, 175°C,.200°C.

Note. -65°C, 155°C, 175°C, and.200°C are only recommended values for storage temperature.

6.1.3 Relative Humidity Range The relative humidity of the sensor's operating environment should meet the requirements in Table 2.

6.1.4 Atmospheric pressure The sensor should operate within an atmospheric pressure range of 86 kPa to 106 kPa. Any special requirements exceeding this range should be specified in the product details. The detailed regulations clearly stipulate this.

6.1.5 Device Manual The manufacturer should provide a detailed device manual, providing a detailed description and illustrations of the sensor's external markings (see 6.1.1). The manual content should... At least include.

6.2 Electrical Requirements

6.2.1 Operating Voltage The nominal operating voltage of the sensor is specified by the manufacturer, and the sensor should be guaranteed to operate normally within the specified operating voltage range. Instruments are typically powered by DC power, and can be divided into two categories. unipolar power supply and bipolar power supply. Unless otherwise specified, the typical operating voltage of the sensor is... The following standard values should be selected for the type value.

a) Unipolar power supply options. 3.3V, 5V, 12V, 24V;

b) Bipolar power supply. ±3.3V, ±5V, ±12V, ±15V, ±24V. This requirement does not apply if the sensor itself does not require an external power source (such as a sensor that uses magnetoelectric coupling).

6.2.2 Static operating current The current consumed at the power supply terminal of the sensor when the measured magnetic field is zero under the nominal operating voltage, measured in milliamperes (mA). The static current of the sensor... The operating current should meet the requirements of the product technical conditions or detailed specifications.

6.2.3 Output Signal The sensor's output should preferably be an analog voltage signal. If other output formats are used, their output characteristics should meet the product's technical specifications. The provisions of the document or detailed specifications.

6.3 Performance Requirements

6.3.1 General Provisions According to the classification in Chapter 5, the applicable items in

6.3.15 can be selected as the performance requirements of the sensor.

6.3.2 Measurement Range The sensor's measurement range should conform to the product's technical specifications or detailed specifications. The unit of measurement range should preferably be Tesla (T). Millitesla (mT), microtesla (μT), or nanotesla (nT). Note

1.Tesla (T) and millitalas (mT) are generally suitable for sensors with a large measurement range, such as sensors using the Hall effect or those using the magnetoresistive effect. Sensors; nanotesla (nT) are typically suitable for sensors with small measurement ranges, such as sensors using the fluxgate principle or sensors using magnetoelectric coupling. Sensors. Note

2.Appendix A provides the conversion relationship between the International System of Units (SI) and the Centimeter-Gram-Sec (CGS) system of units.

6.3.3 Basic Error The fundamental error is expressed as a percentage error relative to the full-scale output (%FS). The sensor operates across its entire measurement range. The basic error within the range should comply with the provisions of the product technical

conditions or detailed specifications.

6.3.4 Linearity Linearity is measured by the absolute value of the maximum deviation of the sensor's actual output characteristic curve relative to a reference straight line (least squares fitting) and the full-scale output. The ratio is expressed as %FS. The linearity of the sensor across its entire measurement range should comply with the product technical specifications or detailed specifications.

6.3.5 Sensitivity Under the specified power supply voltage and environmental conditions, the sensitivity of the sensor should meet the requirements of the product technical conditions or detailed specifications.

Note. The unit of sensitivity depends on the output form, such as the sensitivity of analog voltage output, which is expressed in V/T.

6.3.6 Zero-point output error The zero-point output error of the sensor should comply with the product technical conditions or detailed specifications, and the unit is μT (nT, pT).

Note. If the sensor's measurement range does not include zero magnetic field, the zero point is the minimum absolute value of the lower limit of the measurement range.

6.3.7 Hysteresis The hysteresis of the sensor should conform to the product technical conditions or detailed specifications, and the unit is μT (nT, pT).

6.3.8 Magnetic noise The magnetic noise performance of a sensor can be expressed as noise spectral density, with units of pT/Hz (μT/Hz, nT/Hz); or as a peak-to-peak value. The unit is pT (μT, nT). The magnetic noise measured by the sensor under specified conditions should conform to the product technical conditions or detailed specifications.

6.3.9 Amplitude-Frequency Response The amplitude-frequency response of the sensor should conform to the product technical conditions or detailed specifications; the -3dB cutoff frequency of the sensor should preferably be provided. Point, the unit is Hertz (Hz).

6.4.1 Temperature and Humidity

6.4.1.1 Low temperature After the sensor has undergone low-temperature testing, its appearance should meet the requirements of 6.1.1, and its relevant performance should meet the requirements of 6.3.

6.4.1.2 High Temperature After the sensor has undergone high-temperature testing, its appearance should meet the requirements of 6.1.1, and its relevant performance should meet the requirements of 6.3.

6.4.1.3 Temperature Change After the temperature change test, the appearance of the sensor should meet the requirements of 6.1.1, and the relevant performance should meet the requirements of 6.3.

6.4.1.4 Alternating Humid and Heat After undergoing alternating damp heat testing, the