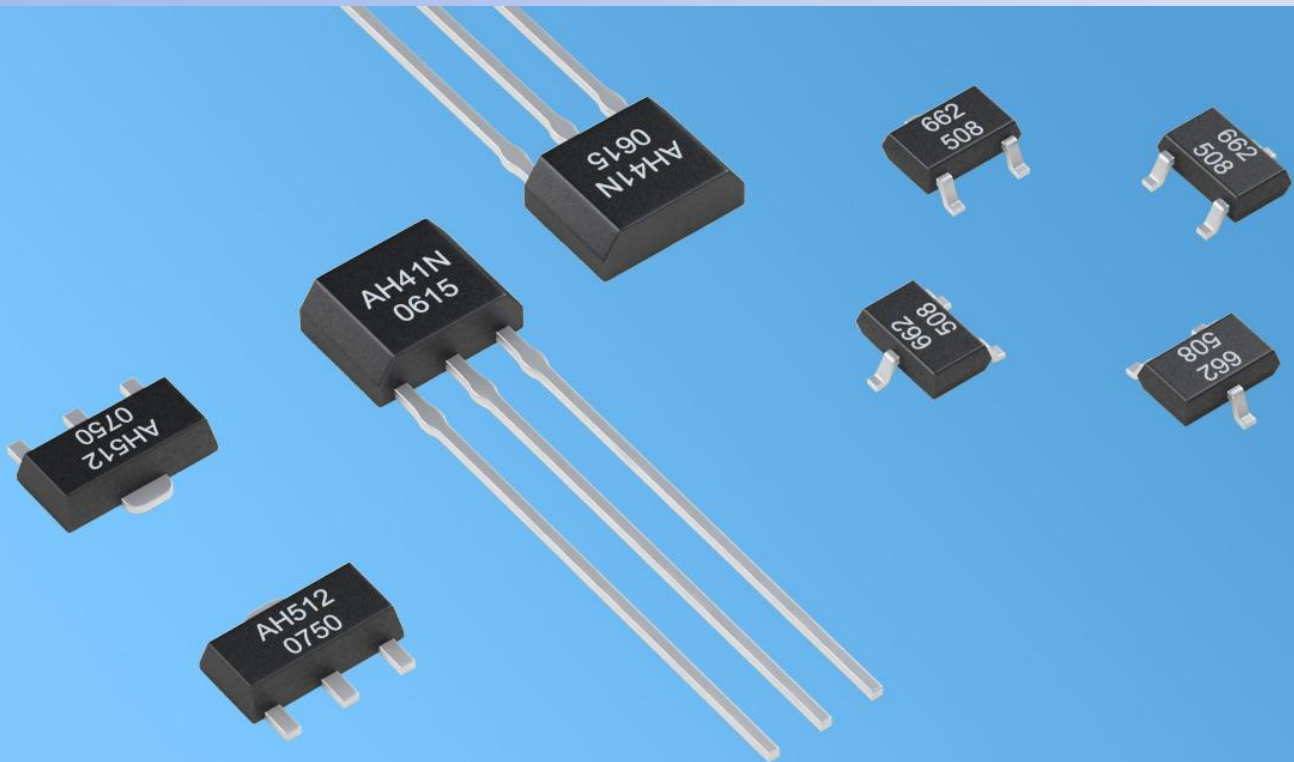


Unipolar Hall Sensor AH543

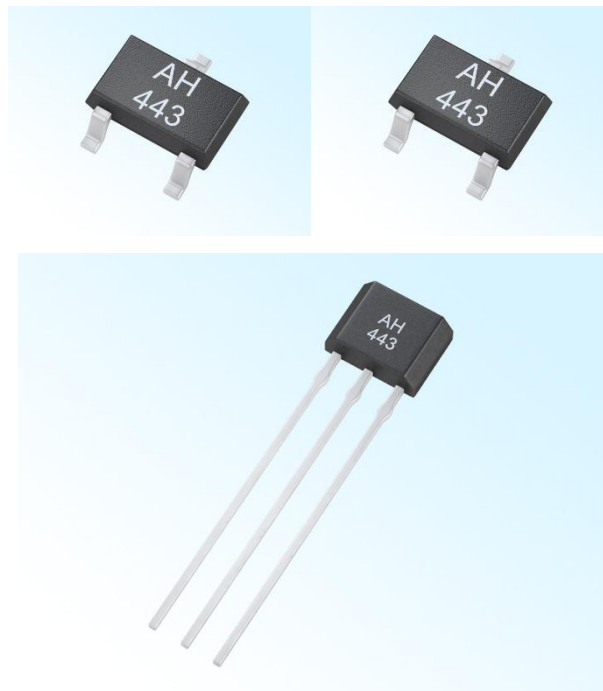


AH

NANJING AH

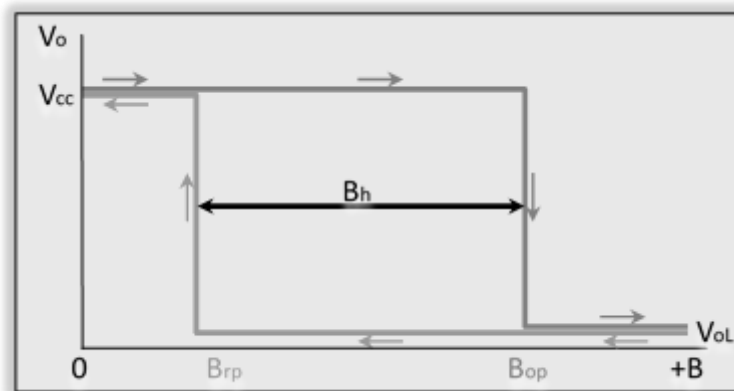
◆ Features

- Rated working voltage 4.5 V ~ 24 V, the limit voltages as low as 3.5 V;
- Operating temperature range: -40°C ~ 150°C;
- Rated output current(sink) : 25 mA, the maximum output current(sink): 50 mA
- Switch response time is about 1μs, the operating frequency DC ~ 100 kHz;
- Small temperature drift between operating point and release point;
- There are variety of packages and out packing options;
- No mechanical contact, no spark, switch signal stability, no shaking moment, high reliability and safety;
- Products meet the EU RoHS instruction 2011/65 / EU and REACH regulations 1907/2006 / EU requirements

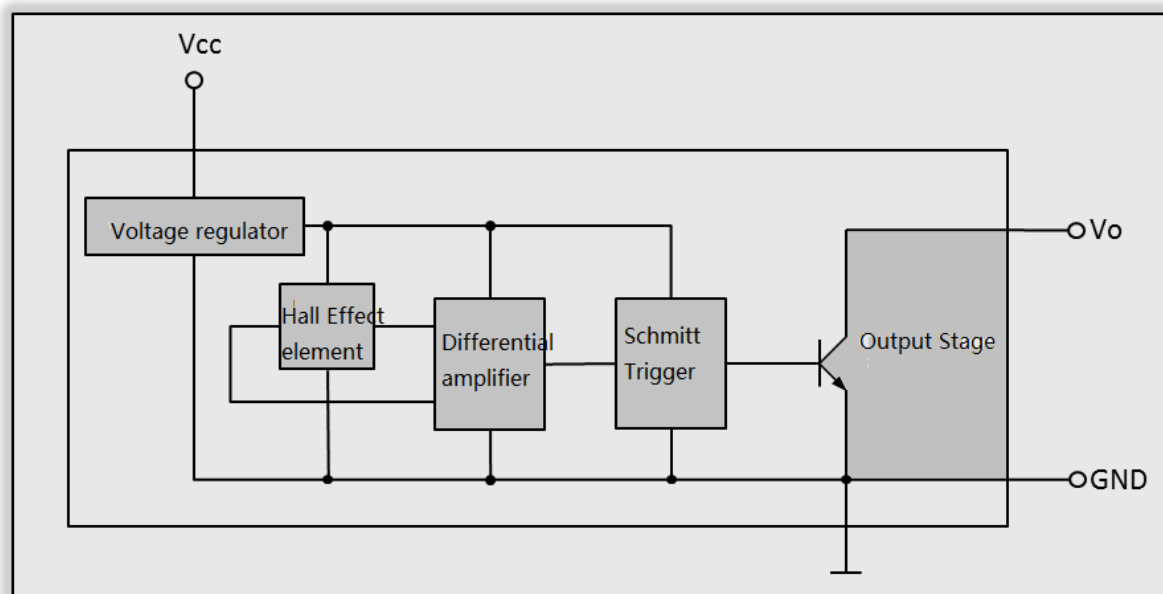


◆ Outline

When the “S” pole of magnet faces the mark surface of the sensor and is closed to sensor ($B \geq B_{OP}$), the sensor outputs low level; When magnet is far away from sensor ($B \leq B_{RP}$), the sensor outputs high level. When the “N” pole faces the mark surface, the sensor is no response. Stable Hysteresis ($B_H = |B_{OP} - B_{RP}|$) ensure Stable sensor's switch status. The magnet and electric transfer characteristic curve is shown as the figure:



◆ Block Diagram



Hall sensor AH543 is one of unipolar excitation single-ended digital output Hall IC. The sensor chip has built-in reverse voltage protection, voltage regulators, temperature compensation circuit, Hall-voltage generator, signal amplifier, Schmitt trigger and open collector output driver circuit unit etc. Excellent voltage regulator and temperature compensation circuit ensure the sensor stable operates over a wide voltage range and temperature range, and the reverse voltage protection circuit avoids the sensor to be damaged by reverse voltage.

◆ Limit Parameter

| Parameter | Symbol | Min. | Max. | Unit |
|------------------------|---------------|-----------|----------------|------|
| Storage Temp. | T_s | -55 | 175 | °C |
| Supply Voltage | V_{CC} | 3.5 | 28 | V |
| Output Cut-off Voltage | V_O (off) | — | 25 | V |
| Magnetic Induction | B | unlimited | unlimited | mT |
| Output Current | I_O | — | 5 ⁰ | mA |

◆ Electrostatic Grade

Under human being mode, the Electrostatic compression is large than $\pm 6\text{kV}$.

◆ Operating Condition

| Parameter | Symbol | Min. | Max. | Unit |
|-----------------|----------|------|------|------|
| Supply Voltage | V_{CC} | 4.5 | 24 | V |
| Operating Temp. | T_a | -40 | 150 | °C |
| Output Current | I_O | — | 5 | mA |

◆ Electrical Characteristic

| Parameter | Symbol | Test Condition | Typ. | Max | Unit |
|------------------------|----------|--|------|-----|---------|
| Output Low Level | V_{OL} | $V_{CC1}=4.5, V_{CC2}=24V, I_O=25mA,$ $B \geq B_{OP}$ | 0.2 | 0.4 | V |
| Output High Level | V_{OH} | $V_{CC1}=4.5, V_{CC2}=24V, I_O=25mA,$ $B \leq B_{RP}$ | 23.5 | 24 | V |
| Output Leakage current | I_{OH} | $V_{CC2}=24V, V_{CC1}$ Open circuit | 0.1 | 10 | μA |
| Supply Current | I_{CC} | $V_{CC1}=24V, V_o$ Open Circuit | 3.5 | 8 | mA |
| Output Rise Edge Time | t_R | $V_{CC1}=V_{CC2}=12V,$ | 125 | 150 | ns |
| Output Fall Edge Time | t_F | $R_L=1.2k\Omega, C_L=20pF$ | 60 | 80 | ns |

◆Magnetic Characteristic

Test Condition : $V_{CC1} = V_{CC2} = 24V$, $I_0 = 50mA$

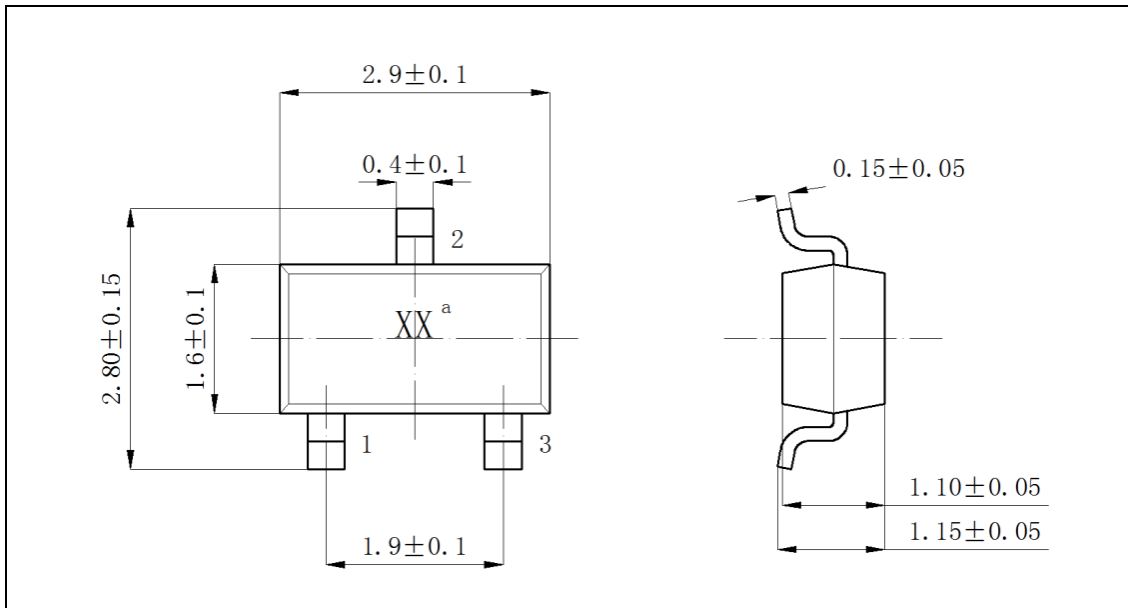
| Parameter | Symbol | Min. | Typ. | Max. |
|---|----------------------------|------|------|------|
| Operate Point | B_{OP} | — | — | 25 |
| Release Point | B_{RP} | 3 | — | — |
| Hysteresis Operate point-Release point | B_H $B_{OP}-B_{RP}$ | 2 | — | 6 |

Note 1: Unit is mT, 1mT=10Gs

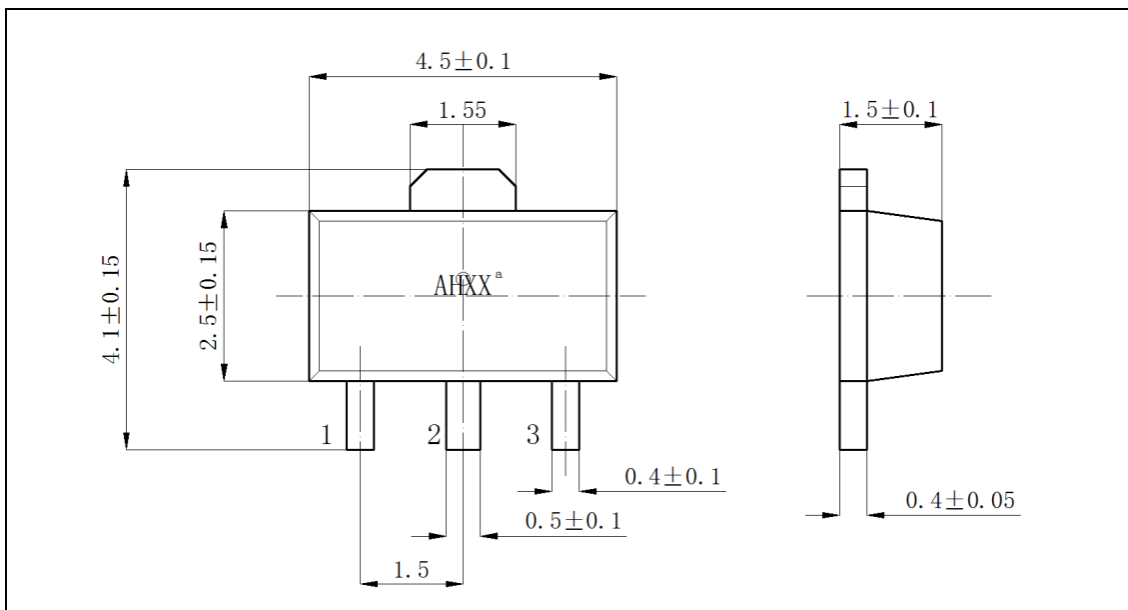
Note2: When the “S”Pole of the magnetic field is vertical to the front mark of product, we call the magnetic field $B > 0$.

◆ Package Outline

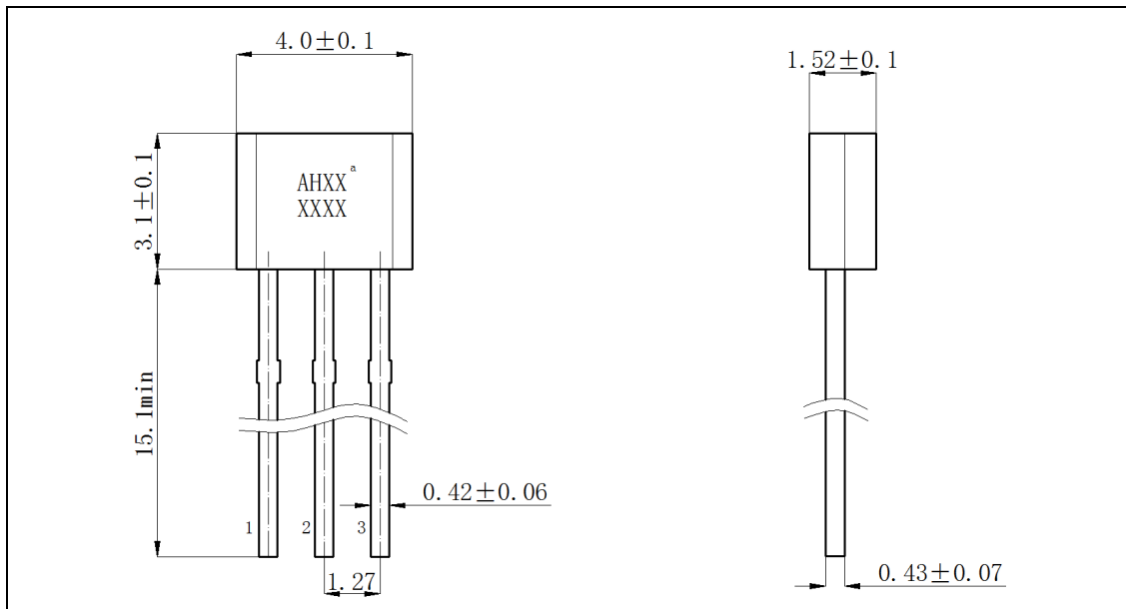
- SOT23-3L (M type) Package figure (Unit: mm)



- SOT89-3L (S type) Package figure (Unit: mm)



- TO-92UA/TO-92S (UA type) Package figure (Unit: mm)



Note: In the above package outline figure, Pin 1: Vcc, Pin2: GND, Pin 3: Output terminal.

- Mark

Mark "XX" or "AHXX" are abbreviation form of the parts No., the second line "XXXX" means product lot No.