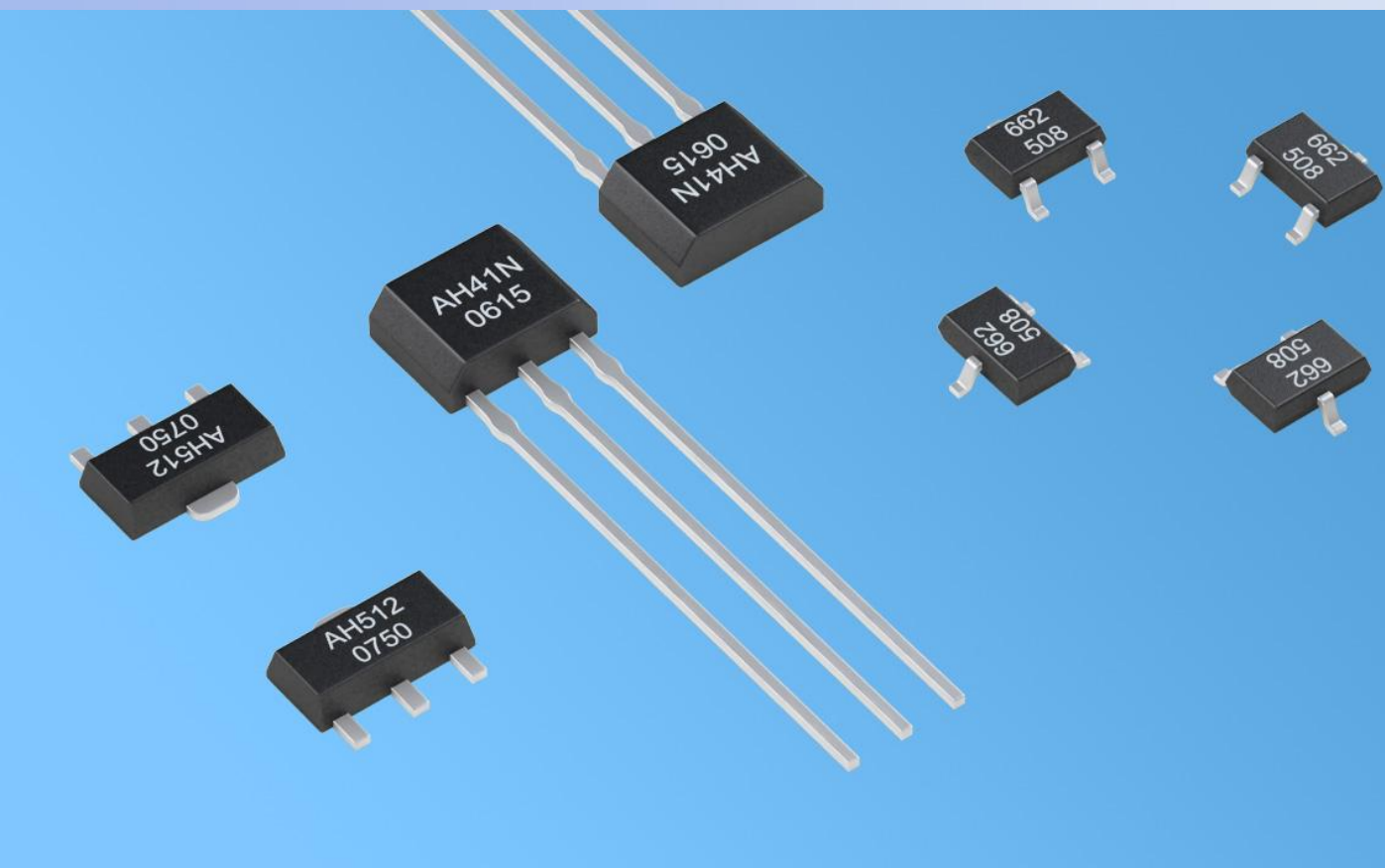


# Latch type Hall Sensor AH513



**AH**  
NANJING AH

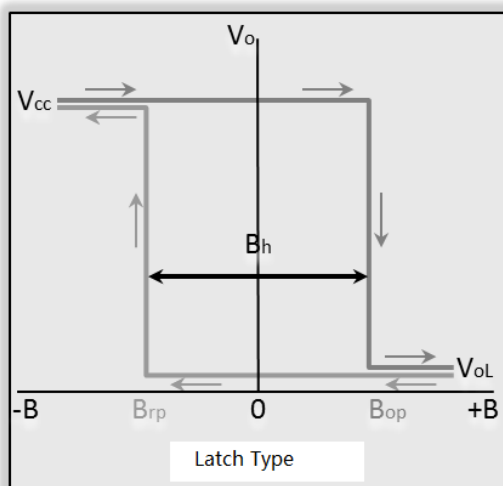
## ◆ Features

- Rated working voltage 4.5 V ~ 24 V, the limit voltages as low as 3.5 V;
- Operating temperature range: -55°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;
- 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

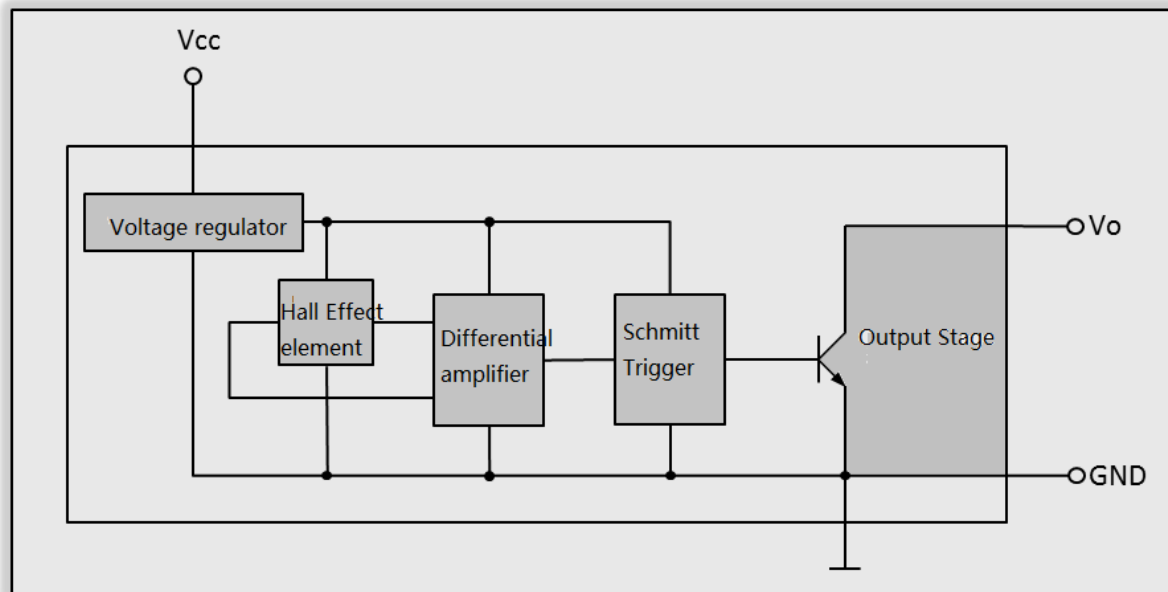


## ◆ Outline

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 the N pole faces the mark surface and is closed to sensor ( $B \leq B_{rp}$ ), the sensor outputs high level. When the magnet is far away with the sensor ( $B=0$ ), the output status of the sensor is latched and keeps constant. In order to change the output status, the applied magnetic field must be opposite polarity. The magnet and electric transfer characteristic curve of AH513 is shown as the figure:



## ◆ Block Diagram



Hall sensor AH513 is one of bipolar excitation single-ended digital output Hall IC. The output signal owns latch function. 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 drives circuit unit. 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         | $I_o$         | —         | 50        | mA   |

### ◆ Electrostatic Grade

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

### ◆ Operating Condition

| Parameter       | Symbol   | Min. | Max. | Unit |
|-----------------|----------|------|------|------|
| Supply Voltage  | $V_{CC}$ | 4.5  | 24   | V    |
| Operating Temp. | $T_a$    | -55  | 150  | °C   |
| Output Current  | $I_O$    | —    | 8    | mA   |

### ◆ Electrical Characteristic

| Parameter              | Symbol   | Test Condition   | Typ. | Unit |         |
|------------------------|----------|--|------|------|---------|
| Output Low level       | $V_{OL}$ | $V_{CC1}=4.5, V_{CC2}=24V,$<br>$I_O=25mA, B \geq B_{OP}$ | 0.2  | 0.4  | V       |
| Output High Level      | $V_{OH}$ | $V_{CC1}=4.5, V_{CC2}=24V,$<br>$I_O=25mA, B \leq B_{RP}$ | 23.5 | 24   | V       |
| Output Leakage Current | $I_{OH}$ | $V_{CC2}=24V, V_{CC1}$ Open Circuit                      | 0.1  | 10   | $\mu A$ |
| 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 :  $V_{CC1} = V_{CC2} = 24V$  ,  $I_O = 50mA$ 

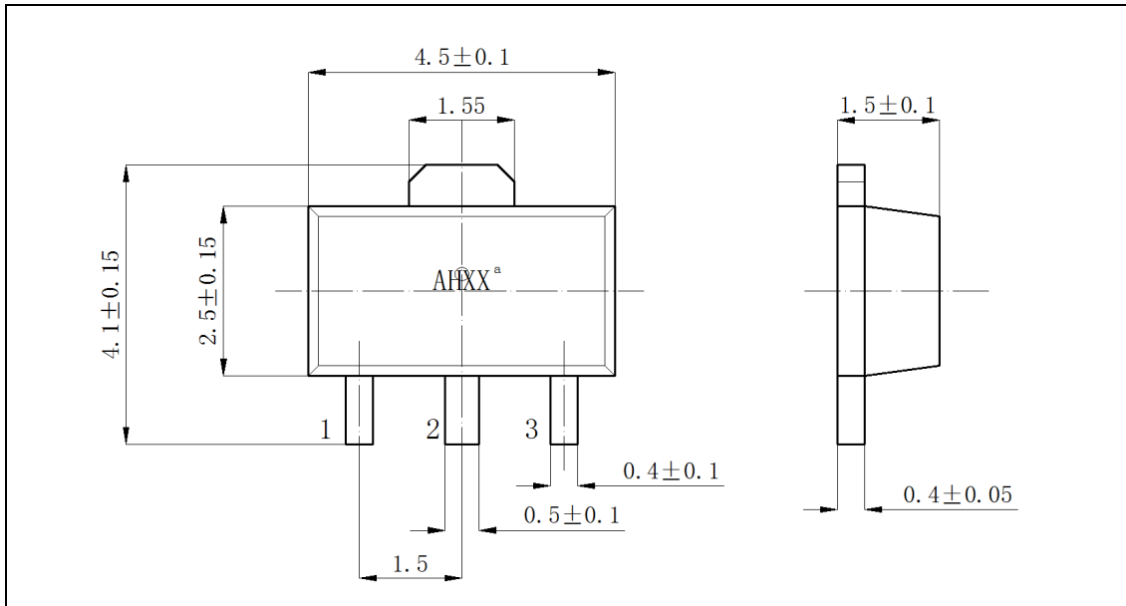
| Parameter                                       | Symbol                       | Min. | Typ. | Max. |
|---|------------------------------|------|------|------|
| Operate Point                                   | $B_{OP}$                     | —    | 4    | 7    |
| Release Point                                   | $B_{RP}$                     | -7   | -4   | —    |
| Hysteresis<br>  Operate point –Release<br>Point | $B_H$<br>  $B_{OP} - B_{RP}$ | 4    | 8    | 14   |

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

Note 2: 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

- SOT-89 Package figure ( Unit: mm )



Note: In the package outline, Pin1 is Vcc, Pin 2: GND, Pin3: output terminal.

- Mark

Mark “XX” or “AHXX” are abbreviation form of parts No.