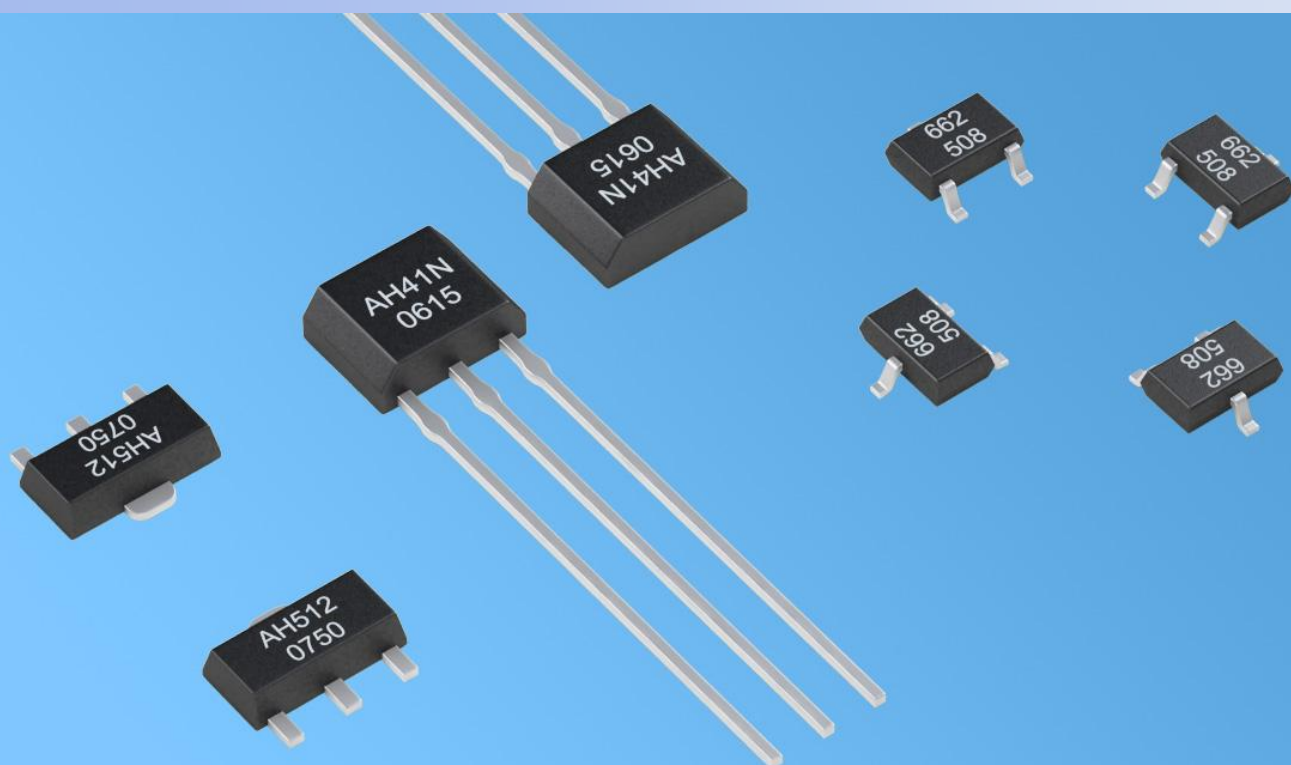


# Unipolar Hall Sensor AH441

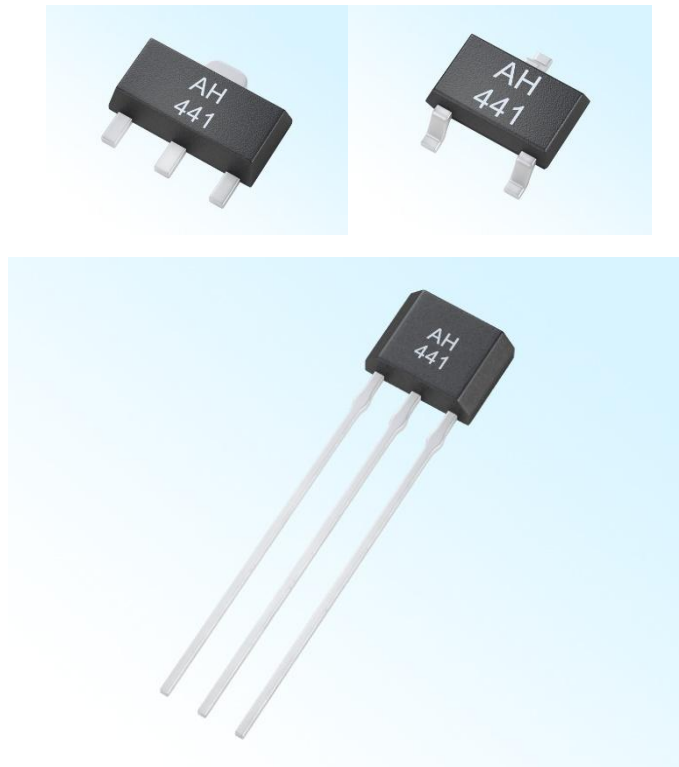


**AH**

NANJING AH

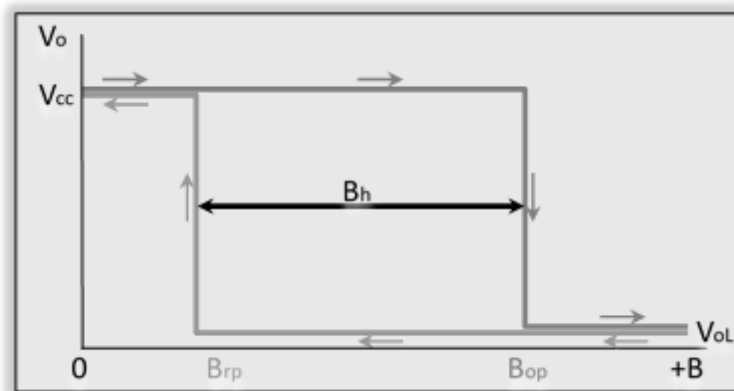
◆ Features

- 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

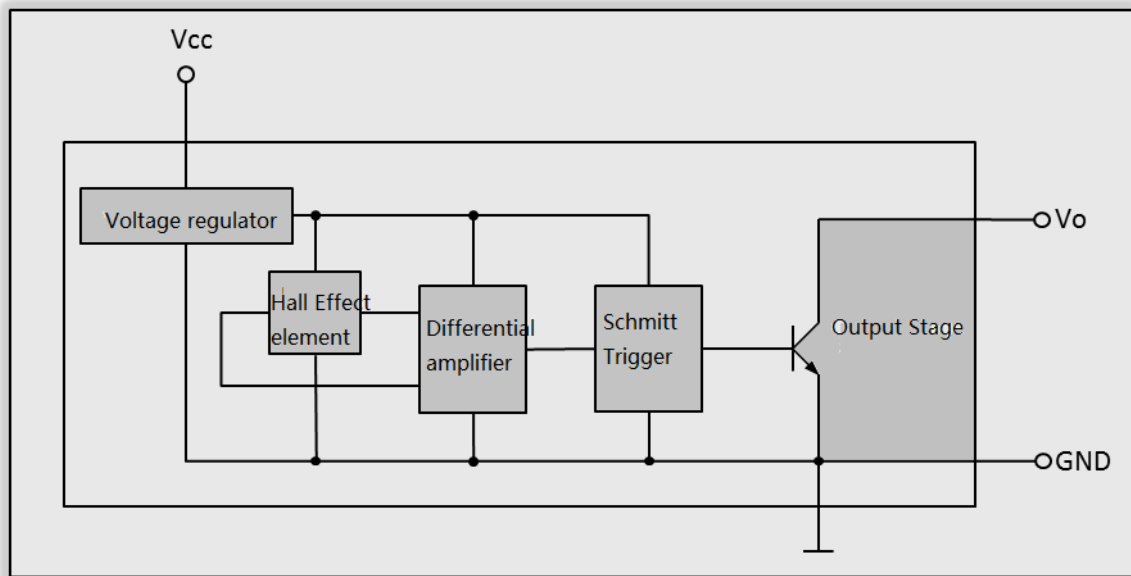


## ◆ Outline

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 the stable sensor's switch status. The magnet and electric transfer characteristic curve of AH441 is shown as the figure:



### ◆ Block Diagram



Hall sensor AH441 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 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	$I_o$	—	5 <sup>0</sup>	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	$\mu A$
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 :  $V_{CC1} = V_{CC2} = 24V$  ,  $I_0 = 50mA$

Parameter	Symbol	Min.	Typ.	Max.
Operate Point	$B_{OP}$	—	10	12
Release Point	$B_{RP}$	4	7	—
Hysteresis  Operate point-Release point	$B_H$   $B_{OP} - B_{RP}$	2	3.5	5

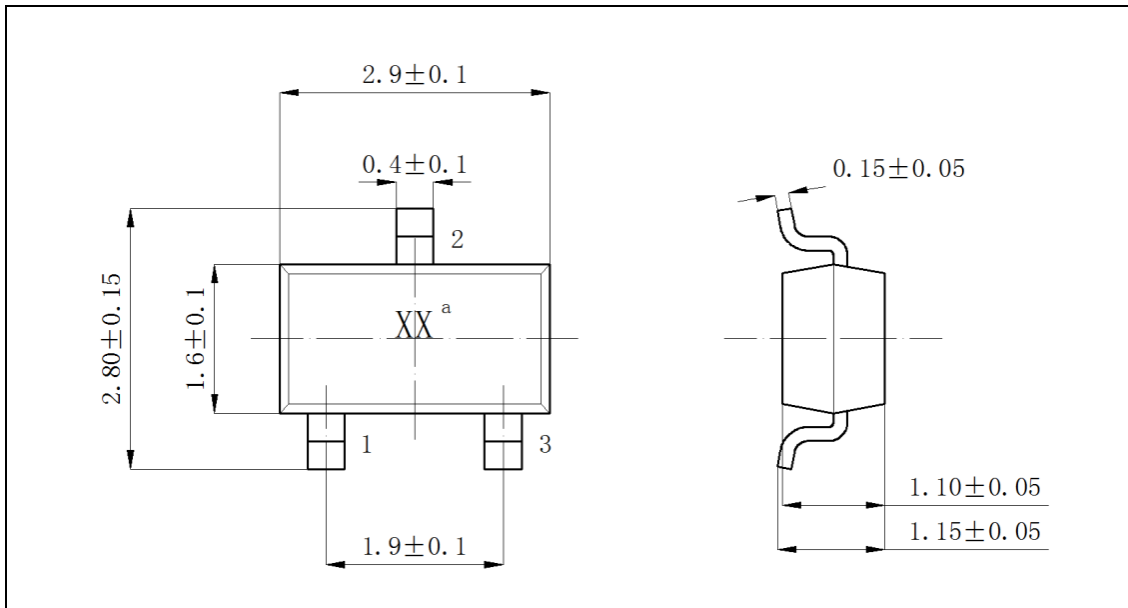
Note 1: Unit is mT, 1mT=10Gs

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

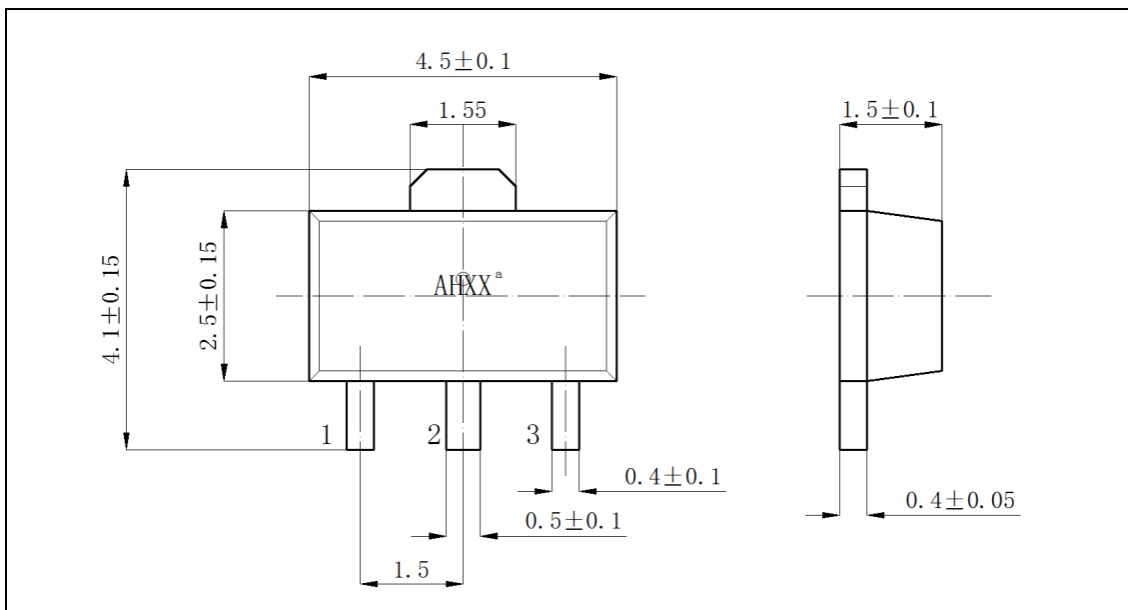
Note 3: For M type ( SOT23-3L) product, the operating magnetic field is subject to “N” pole.

◆ Package Outline

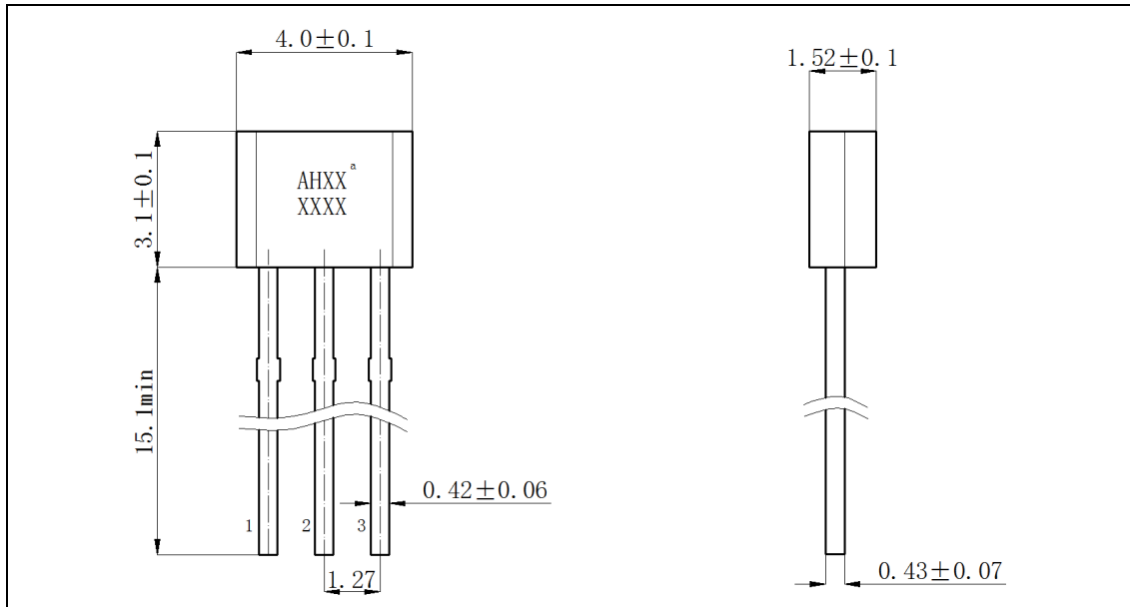
- SOT23-3L ( M type ) Package figure ( Unit: mm )



- 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.