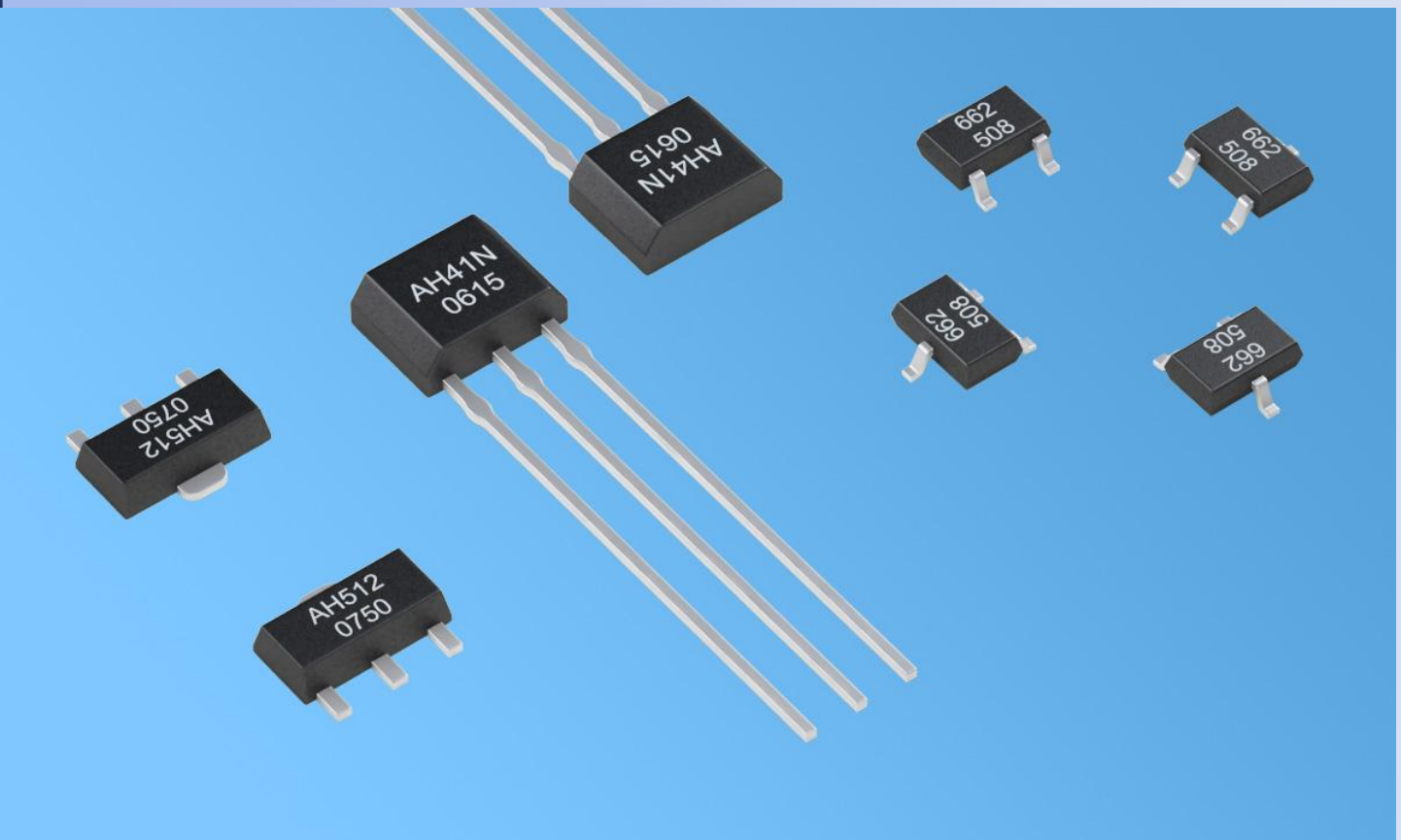




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Unipolar Hall Sensor AH441

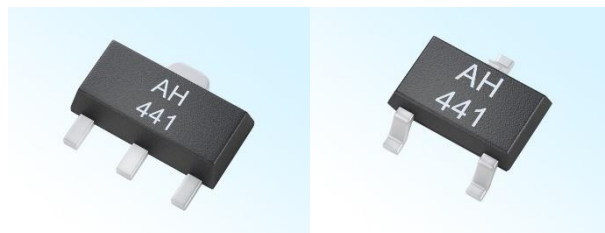


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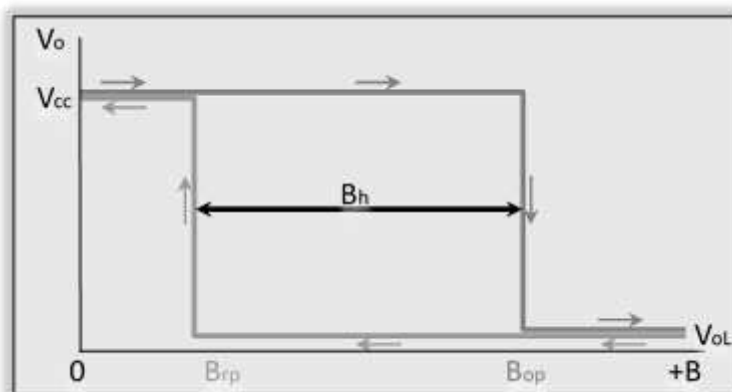
◆ Features

- 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

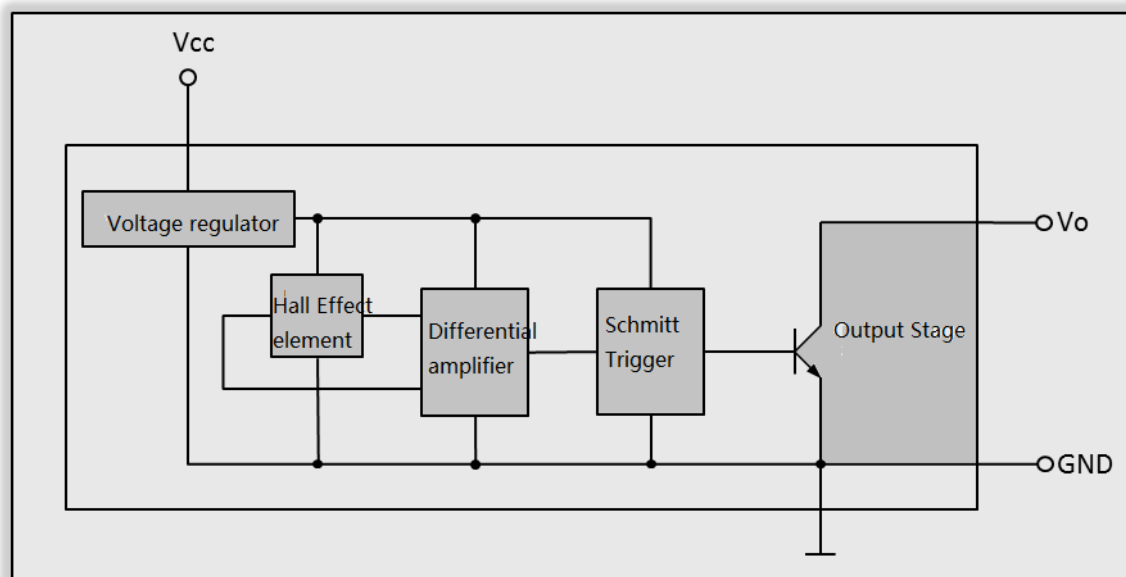


◆ Outline

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 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

Paramater	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 : $V_{CC1} = V_{CC2} = 24V$, $I_O = 50mA$

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

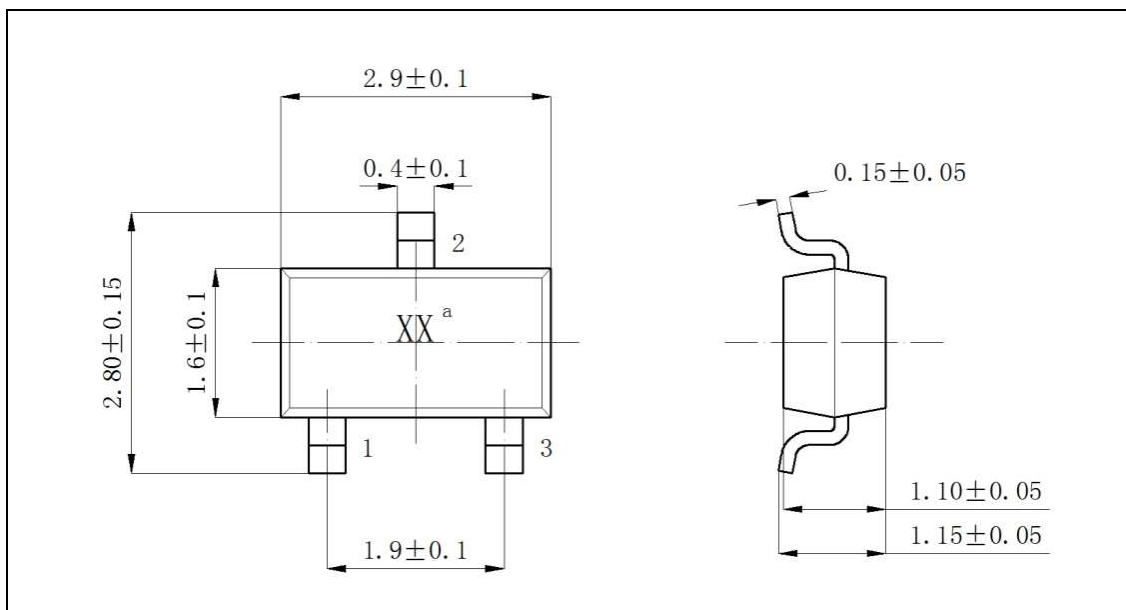
Note 1: Unit is mT, 1mT=10Gs

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

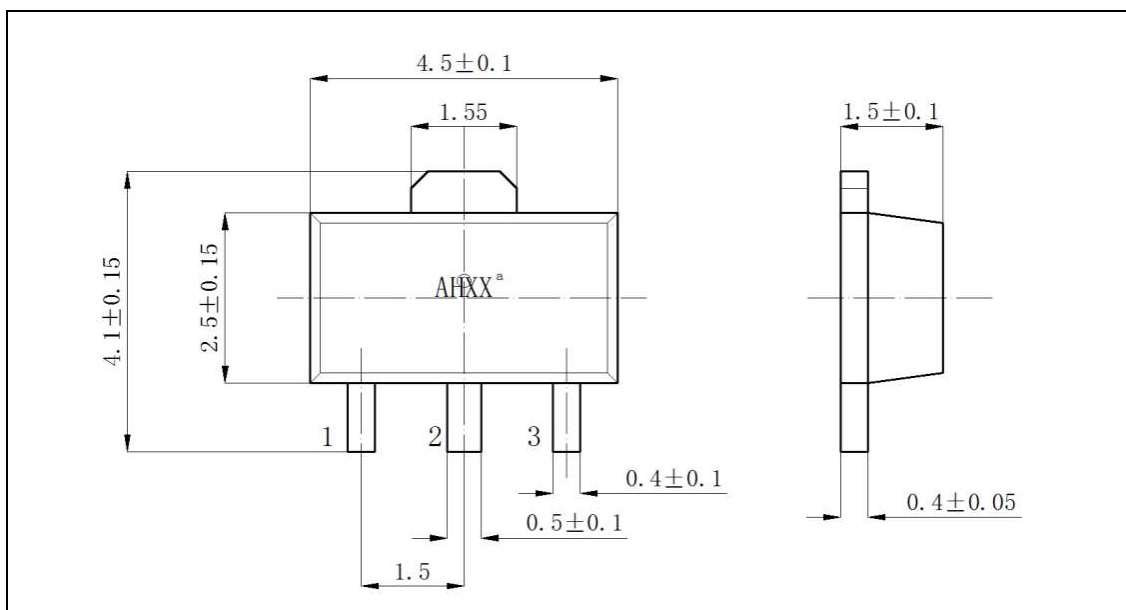
Note 3: For M type (SOT23-3L) product, the operating magnetic field is subject to “N” pole.

◆ Package Outline

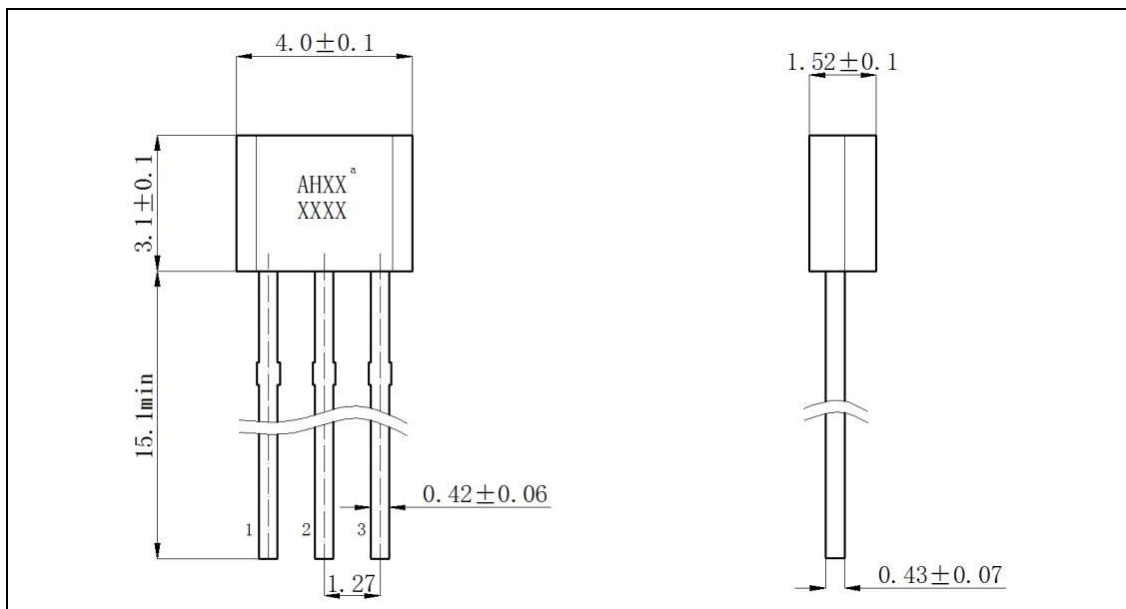
- SOT23-3L (M type) Package figure (Unit: mm)



- 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.