

## AH35 Series Linear Digital Hall Effect Sensor

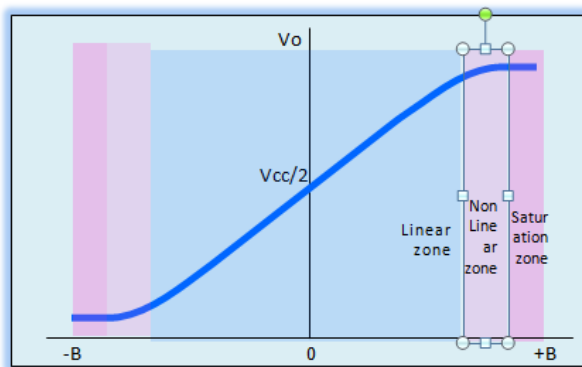
### ◆ Outline

AH35 Series Hall sensor is an analog signal outputs Hall IC, output voltage varies with the intensity of the magnetic field. The sensor chip has built-in reverse voltage protection, voltage regulators, temperature compensation circuit, Hall voltage generator, signal amplifier etc circuit unit. Excellent voltage regulator and temperature compensation circuit enable the sensor stable operation within a wide voltage range and temperature range, the reverse voltage protection circuit avoids the sensor being reverse voltage damage.

### ◆ Magnetic and electric transfer characteristic

#### Linear Hall effect Sensor magnetic and electric transfer characteristic: :

The Sensor will pass the linear zone/non linear zone/saturation zone during the period when the magnetic strength increases: when no magnetic field applied on the sensor ( $B=0$ ), the output of the sensor is about half of the  $V_{cc}$  ( $V_{cc}/2$ ); When “N” pole faces sensor’s mark surface and be closed to it ( $B \rightarrow -\infty$ ), the output voltage of the sensor begins to reduce, the voltage doesn’t reduce with the enhancing of the field when it reached saturation status; when “s” pole faces the sensor’s mark surface and be closed to it ( $B \rightarrow +\infty$ ), the output voltage begins to increase, and the voltage won’t increase with the enhancing of the field when it reached saturation status. The linear Hall effect sensor magnetic and electric transfer characteristic curve is shown as the figure:

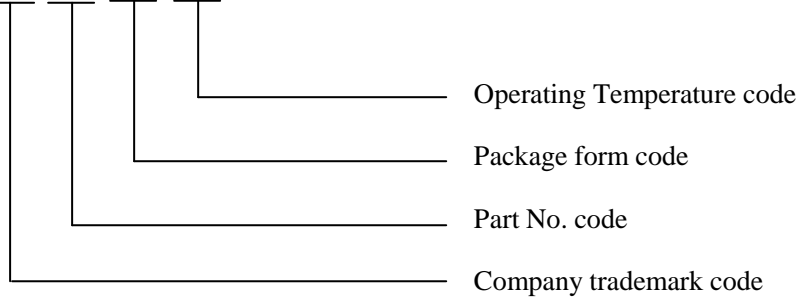




### ◆ Ordering information

Parts No. and order mark

AH



- Company trademark code:  
AH ——Nanjing AH Electronic Science & Technology CO.,LTD
- Parts No. code  
35—— Linear analog signal output Hall effect intergrated circuit series  
XX —— Type. No.
- Package form code  
M——SOT-23-3L (SMD)  
S—— SOT-89 (SMD)  
UA —— TO-92UA/TO-92S (DIP)

Note: M and S type are in reel,

M type is 3k pcs/reel, S type is 1kpcs/reel,

UA type is in bag, 1kpcs/bag or 0.5kpcs/bag.



◆ Features:

- Operating temperature range: -40°C ~ 150°C;
- Rated working voltage 4.5 V ~ 10.5V, the limit voltages as low as 12V;
- Signal stability, reliability and safety;
- There are two packages and packing options;
- Small drift of output signal
- Strong Resistance to mechanical stress and thermal stress capability;
- It can connect directly with digital circuit;
- Products meet the EU RoHS instruction 2011/65 / EU and REACH regulations 1907/2006 / EU requirements.

◆ Application

- Contactless Potentiometer
- Magnetic encoder
- Current sensor
- Electric bike speed control device
- Smart Furniture
- Liquid level sensor
- Ferrous metal detection
- Oil level meter
- Magnetic field strength measurement

◆ Limit Condition

Parameter	Symbol	Limit Value		Unit
		Min.	Max.	
Storage Tempt.	<i>T<sub>s</sub></i>	-65	170	°C
Supply Voltage	<i>V<sub>cc</sub></i>	4.5	8.0 (注 1)	V
Magnetic Strength	<i>B</i>	unlimited	unlimited	mT

NOTE1: For AH3506(AH496B),the supply voltage limit value is 12.0V.

### ◆ Operating Condition

Parameter	Symbol	Limit Value		Unit
		Min.	Max	
Supply Voltage	$V_{CC}$	4.5	6.0 (Note 1)	V
Operating Temp.	$T_a$	-40	125 (Note 2)	°C
Supply Current	$I_{CC}$	—	12 (Note 3)	mA

Note 1: For AH3506 (AH496B) , supply voltage is 10.5V ;  
 Note 2: For AH3506 (AH496B) ,operating temp. is 150°C ;  
 Note 3: For AH3506 (AH496B) ,operating current is 10mA.

### ◆ Electrical Characteristic

Part No.	Test Condition	Quiescent Output Voltage			Unit
		Min.	Typ,	Max.	
AH3503	TA=25°C, B=0mT, Vcc=5V	2.25	2.50	2.75	V
AH3505 (AH49E)		2.30	2.50	2.70	
AH3506 (AH496B)		2.35	2.50	2.65	

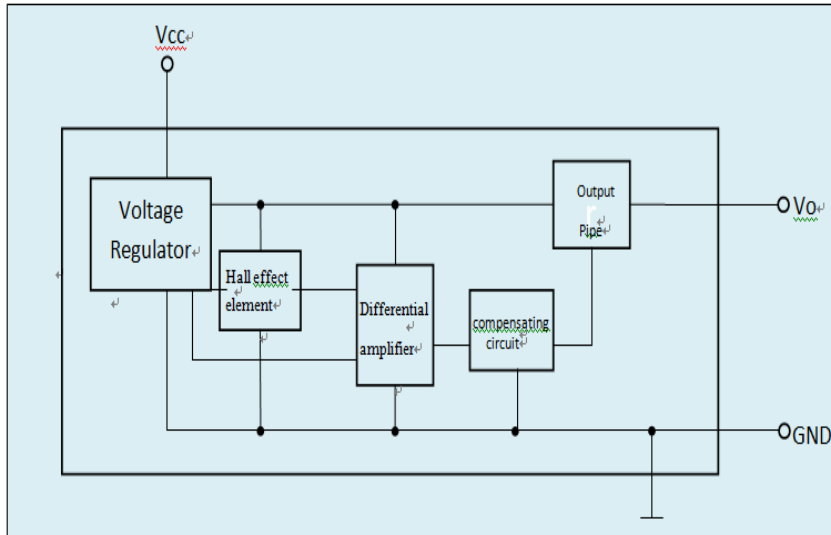
### ● Magnetic Characteristic

Part No.	Package	sensitivity (Note1)			Linearity range (Note2)	
		Min.	Typ	Max	Min.	Max.
AH3503	M, S, UA	19.5	22.0	25.5	-100	100
AH3505 (AH49E)		12.5	17.0	20.5	-90	90
AH3506 (AH496B)		24.5	28.0	31.5	-85	85

Note1: Unit is mV/ mT. The sensitivity has certain reference significance only when the sensor is in the linearity zone. When the magnetic strength of the filed being tested is over the linearity range, It's no way to give the corresponding relations between magnetic strength and the voltage.

Note 2: Unit is mT: 1mT=10Gs .We suggest the sensor's operating field should be less than the range given in the above form in the actual application.

● **Block Diagram**

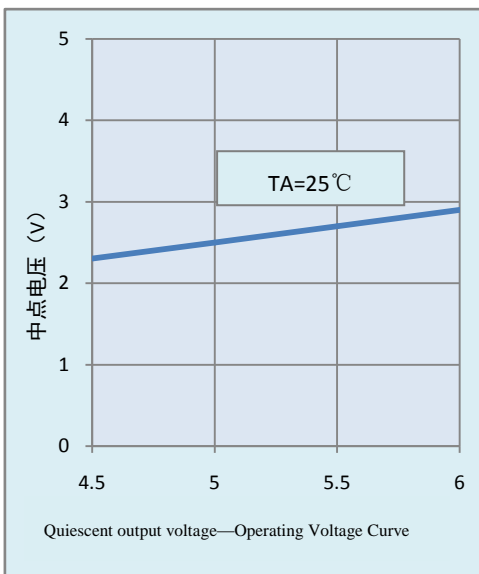
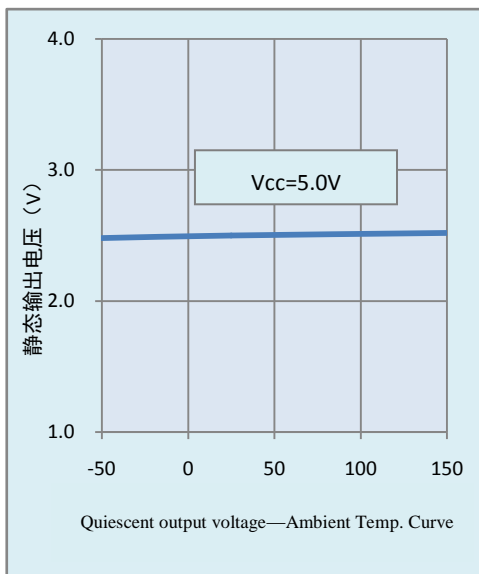


● **Pin Function**

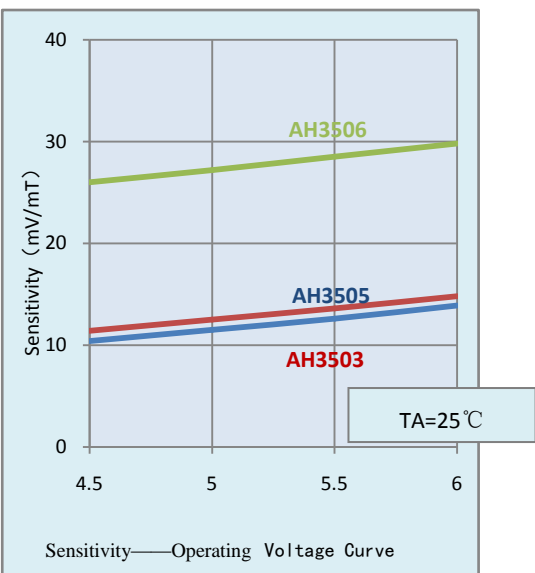
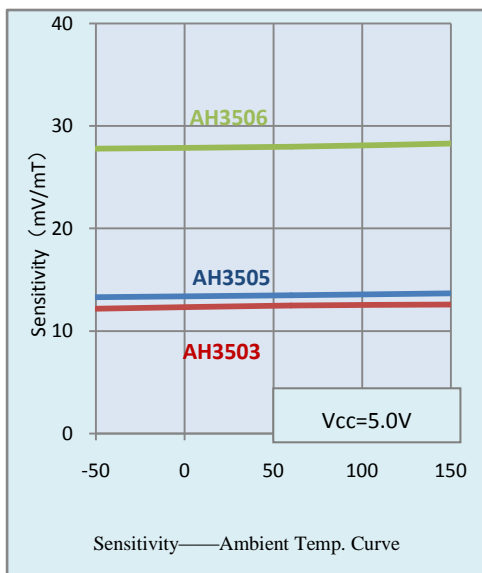
Pin No.	Pin Symbol	Pin Name	Function
1	Vcc	Power Supply	Power Supply (+)
2	GND	Ground	Power Supply (-)
3	Vo	Output	Analog Voltage

◆ **Typical Characteristic Curve**

● **Electrical Characteristic**

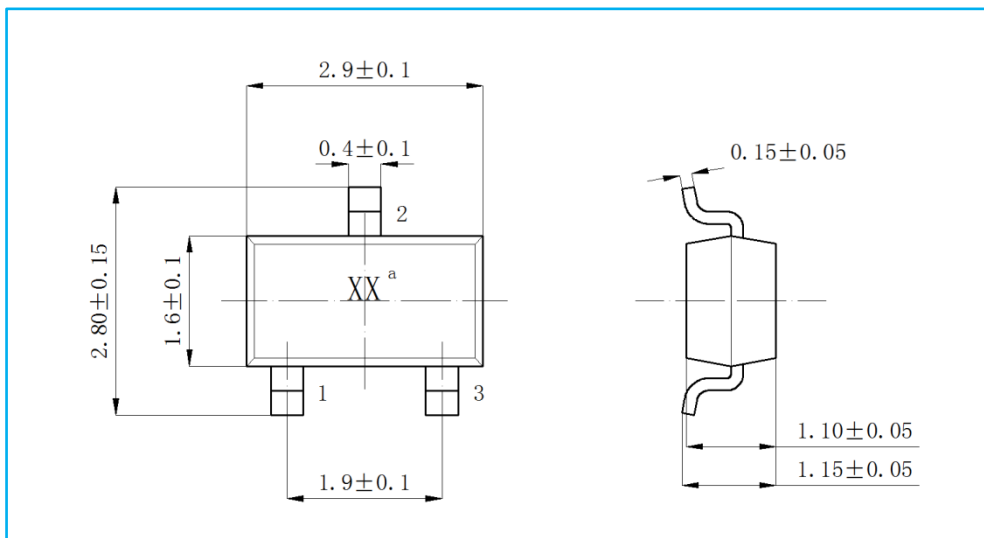


● **Magnetic Characteristic**

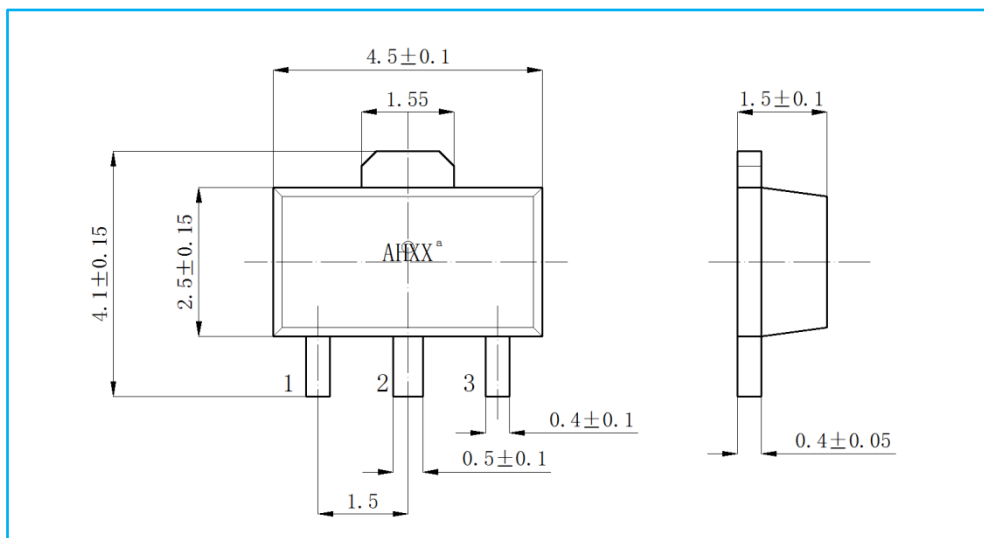


◆ Package Outline and Pin Identify

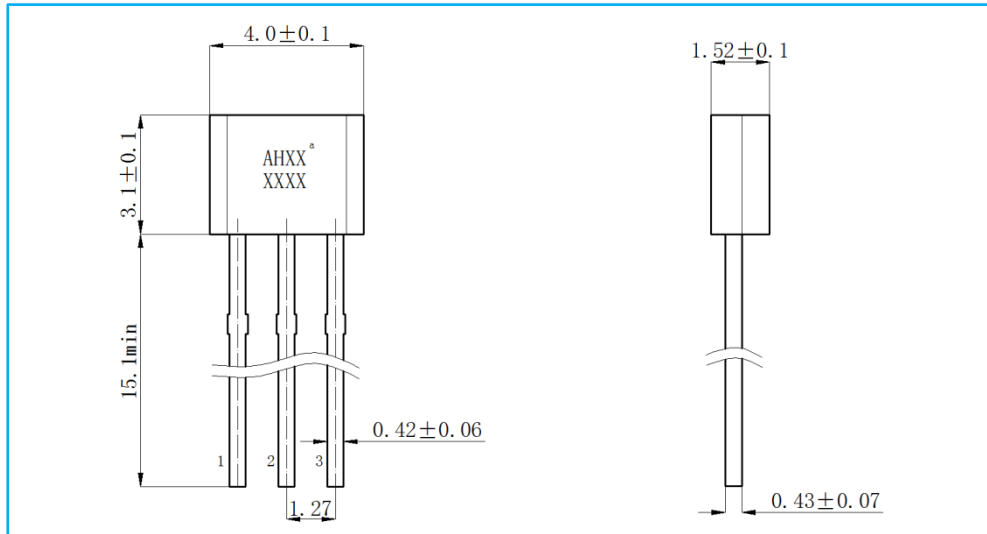
- SOT-23-3L (M Type) Package Figure (Unit:mm)



- SOT-89 (S type) Package Figure (Unit:mm)



- T0-92UA/T0-92S (UA type) Package Figure (Unit:mm)



Note: In the package outline figure, Pin 1 is Vcc, Pin 2 is GND, Pin 3 is output.





- Mark  
Mark XX or AHXX means abbreviated parts No., the second line XXXX means product lot No.
- Pin configuration
  - a) **M Type:** It faces product mark, and two pins are downward, towards the left, clockwise, the pin No. is 1、 2、 3 in turn.
  - b) **S Type and UA Type:** It faces product mark, and the pins are downward, from left to right, the pin No. is 1、 2、 3 in turn.

### **Important Declaration**

The document's version is Aug 2013, and the copyright belongs to Nanjing AH Electronic Science & Technology CO.,Ltd.

The description about product function in the document meets our company's product specification. In order to improve the design and reliability, our company reserve the right , from time to time, to update the product function specification. Before ordering, the user needs to carefully check the information that depends on is correct.

The information in the document is believed to be correct and reliable. Our company assumes no responsibility for its use, nor for any infringement of patents or other rights of third parties which may result from its use.