

AH49HSC

LINEAR HALL EFFECT IC

Description

The AH49HSC is a small, versatile linear Hall-effect device that is operated by the magnetic field from a permanent magnet or an electromagnet. The output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field.

The integrated circuitry features low noise output, which makes it unnecessary to use external filtering components. It also includes precision resistors to provide increased temperature stability and accuracy. The operating temperature range of these linear Hall sensors is -40°C to 105°C .

The AH49HSC is available in standard SOT-23-3 packages.

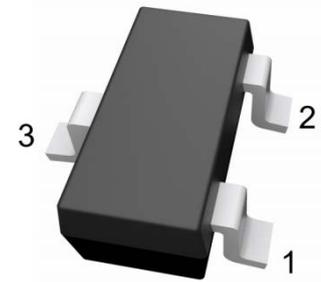
Features

- Miniature Construction
- Power Consumption of 2mA at $V_{CC}=3.3\text{V}$ for Energy Efficiency
- Single Current Sourcing Output
- Linear Output for Circuit Design Flexibility
- Low Noise Output Virtually Eliminates the Need for Filtering
- A Stable and Accurate Output
- Temperature Range: -40°C to 105°C
- Responds to Either Positive or Negative Gauss
- The Maximum Instantaneous Supply Voltage Up to 50V
- High ESD Rating: 6000V (Human Body Model)
400V (Machine Model)

Application

- Current Sensing
- Motor Control
- Position Sensing
- Magnetic Code Reading
- Rotary Encoder
- Ferrous Metal Detector
- Vibration Sensing
- Liquid Level Sensing
- Weight Sensing

SOT-23-3

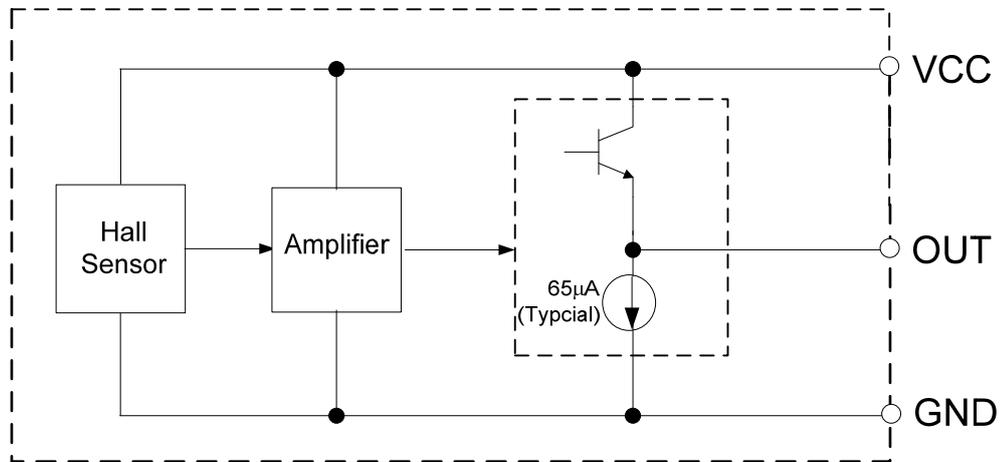


1.VCC 2.OUT 3.GND

Marking: AH49H



Functional Block Diagram



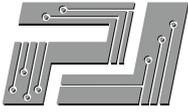
Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	10	V
Instantaneous Supply Voltage	V_{CC_INST}	50	V
Power Dissipation	P_D	230	mW
Ambient Temperature	T_A	-40 to 125	°C
Storage Temperature	T_{STG}	-50 to 150	°C
ESD (Human Body Model)		6000	V
ESD (Machine Mode)		400	V

Note 1: Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

Recommended Operating Conditions ($T_A=25^\circ\text{C}$)

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	3	8	V
Operating Temperature	T_{OP}	-40	105	°C



Electrical Characteristics

$V_{CC}=3.3V$, $T_A=25^{\circ}C$, unless otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Current	I_{CC}		1.2	2	3.2	mA
Quiescent Output Voltage	V_{NULL}	$B=0$ (Gauss)	1.45	1.7	1.85	V
Output Voltage Sensitivity	V_{SEN}	$B=\pm 600$ (Gauss)		0.33		mV/Gauss
Output Voltage Span	$V_{OUT\ S}$			0.85 to 2.6		V
Output Resistor	R_{OUT}		30	50	70	Ω
Linear Magnetic Range	B			± 3000		Gauss
Output Noise		Bandwidth=10Hz to 10kHz		90		μV

Transferring Characteristics ($V_{CC}=3.3V$)

When there is no outside magnetic field ($B=0$ Gauss), the quiescent output voltage is one-half the supply voltage in general.

For TO-92 package, if a south magnetic pole approaches the front face (the side with marking ID) of the Hall effect sensor, the circuit will drive the output voltage higher. In contrary, a north magnetic pole will drive the output voltage lower. The variations of voltage level up or down are symmetrical. Because the SOT-23-3 is reversed packaging with TO-92, so the magnetic performance is also reversed. Therefore, if the reversed magnetic pole approaches the front face, the output is the same as TO-92 package. Greatest magnetic sensitivity is obtained with a supply voltage of 8V, but at the cost of increased supply current and a slight loss of output symmetry. So, it is not

recommended to work in such condition unless the output voltage magnitude is a main issue. The output signal can be capacitively coupled to a next-level amplifier for further amplifying if the changing frequency of the magnetic field is high.

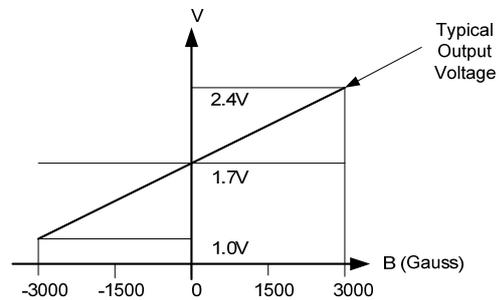
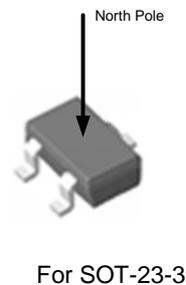
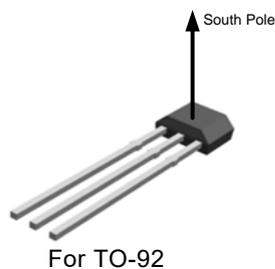
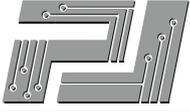
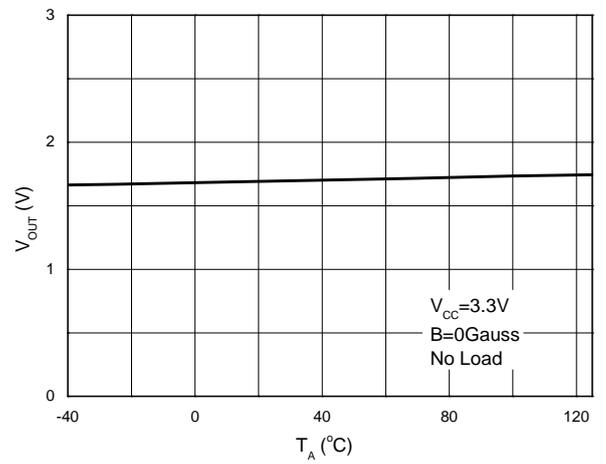
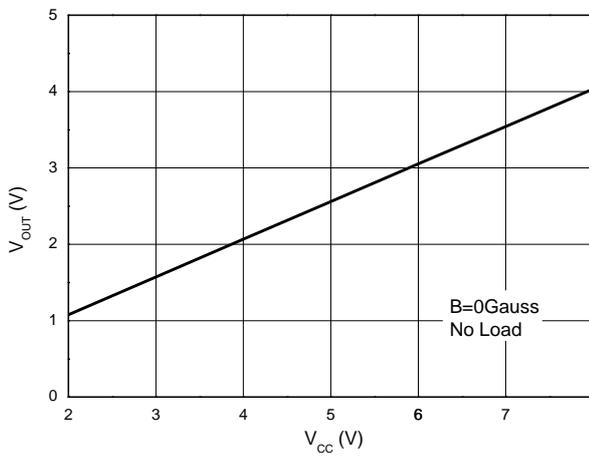
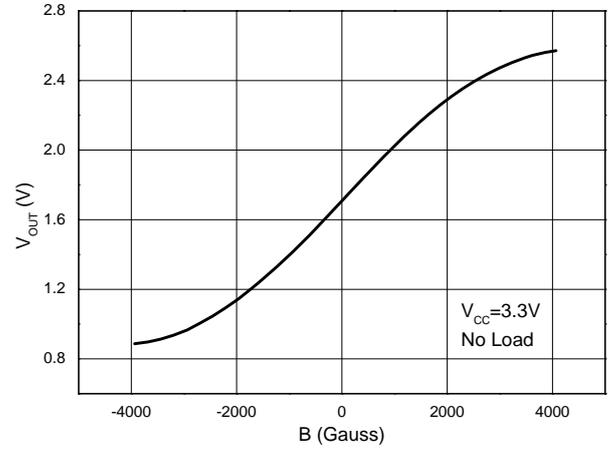
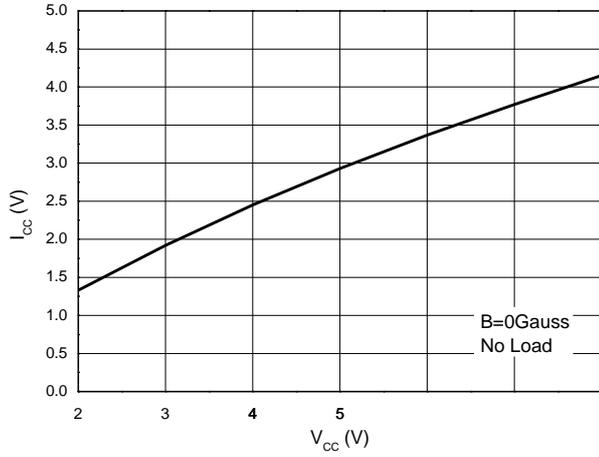


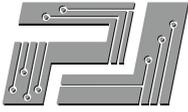
Figure 4. Transferring Characteristic of AH49H





Typical Characteristics Curves

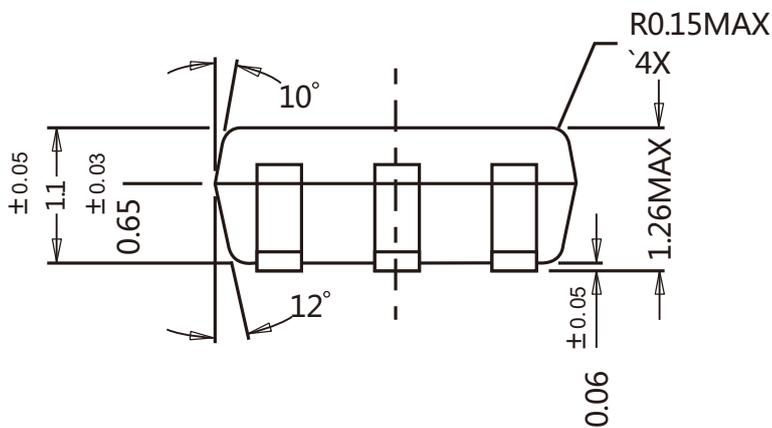
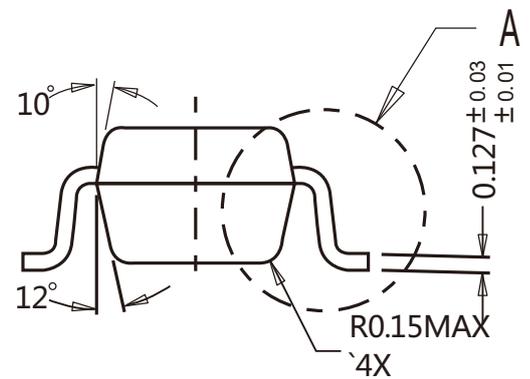
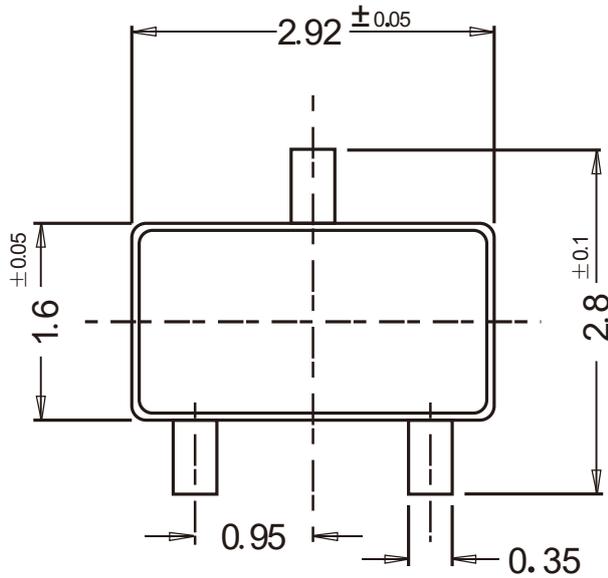




Package Outline

SOT-23-3

Dimensions in mm



Ordering Information

Device	Package	Shipping
AH49HSC	SOT-23-3	3000PCS/Reel&Tape