

AH49HSC

LINEAR HALL EFFECT IC

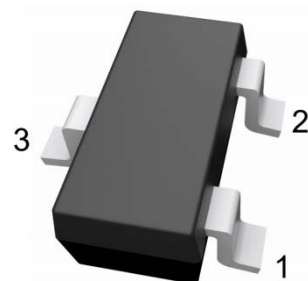
Description

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.

SOT-23-3



1.VCC 2.OUT 3.GND

Marking: AH49H

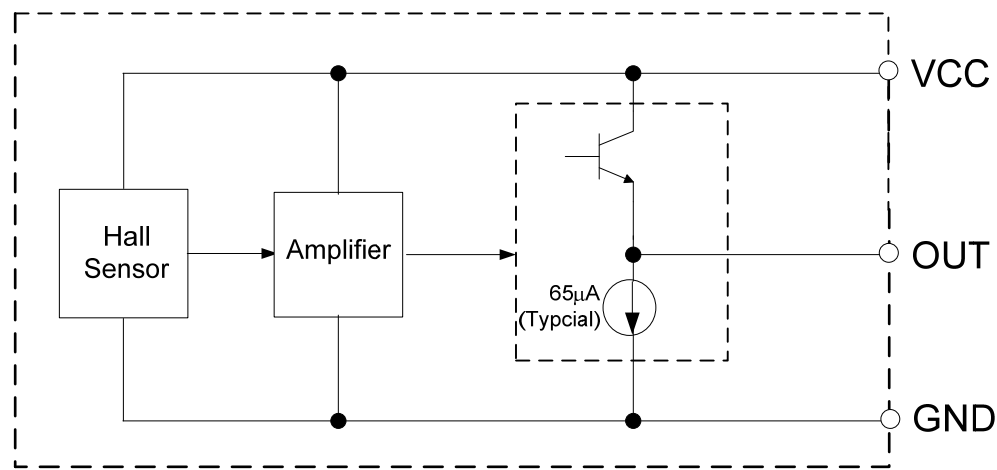
Features

- Miniature Construction
- Power Consumption of 2mA at $V_{CC}=3.3V$ 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

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.

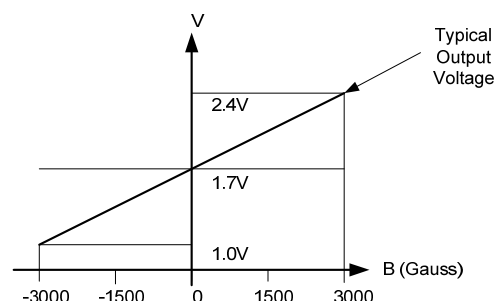
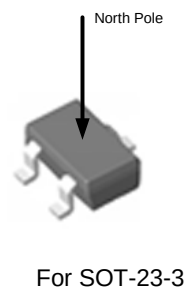
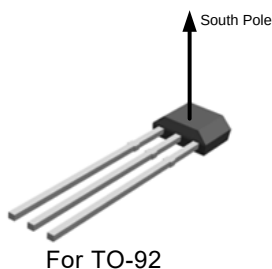
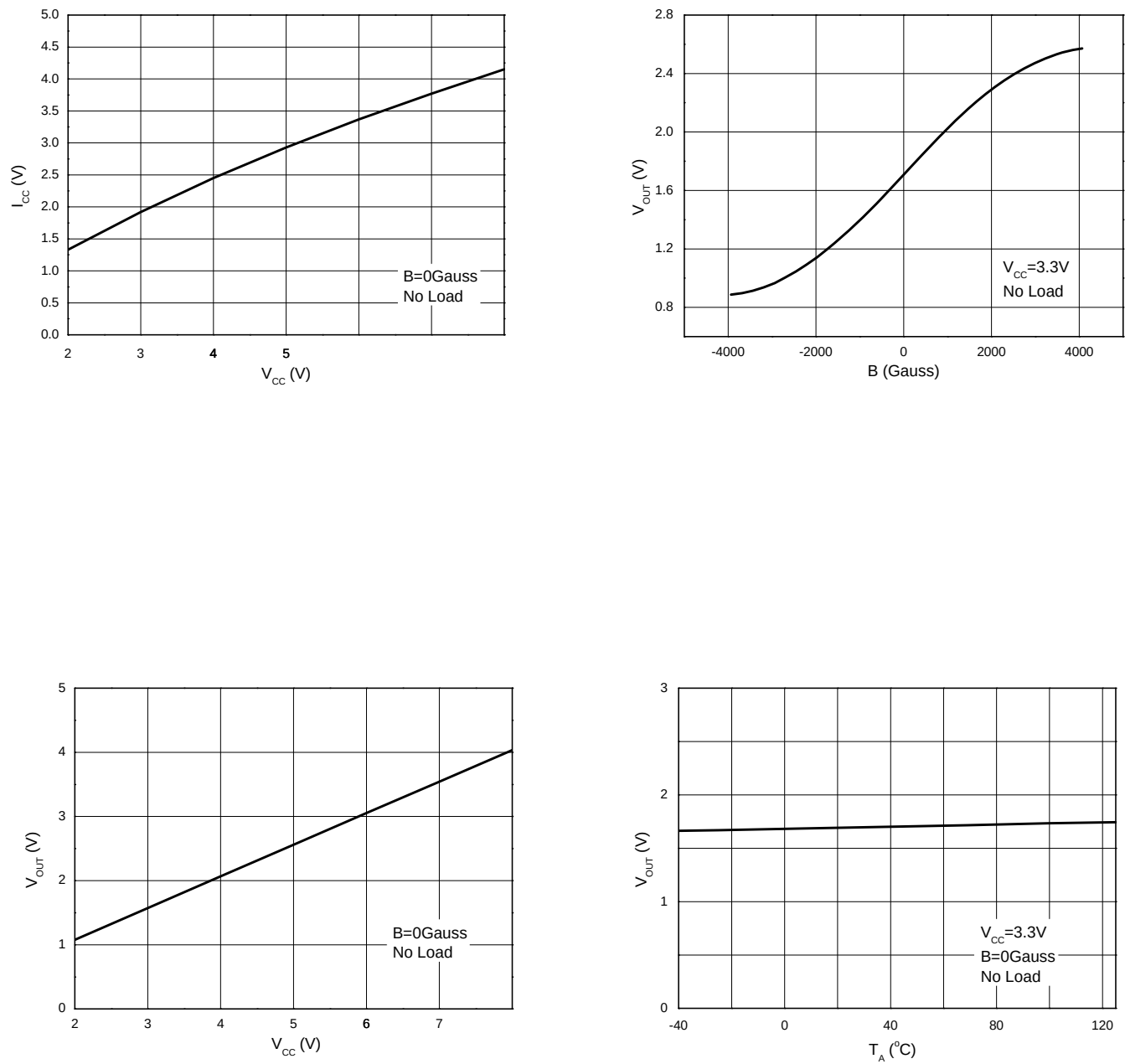


Figure 4. Transferring Characteristic of AH49H



Typical Characteristics Curves

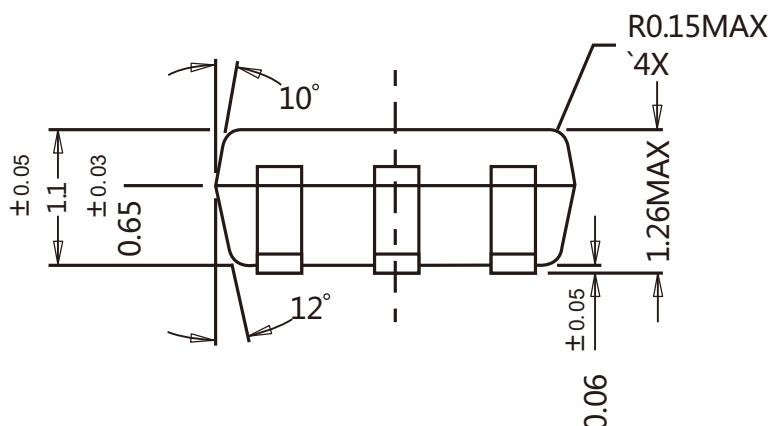
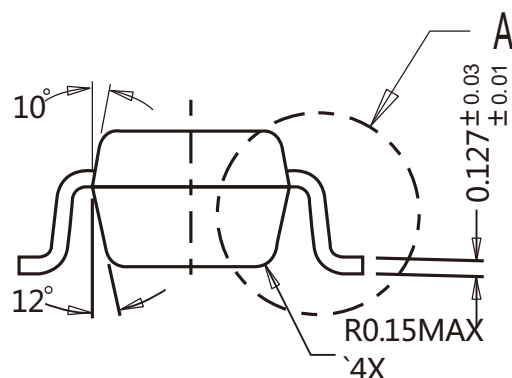
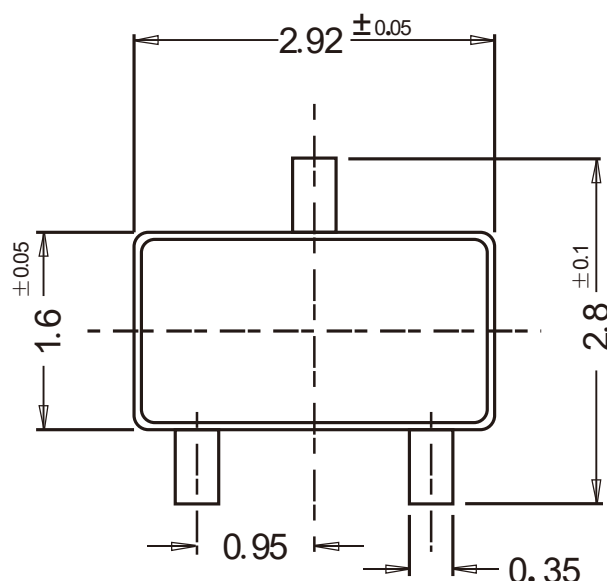


Ordering Information

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

Package Outline

SOT-23-3 Dimensions in mm



Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com For additional information, please contact your local Sales Representative.

 is registered trademarks of TANI Corporation.

Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

TANI reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with TANI to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult TANI in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. TANI shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.