



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. .

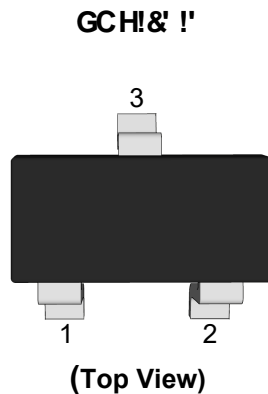
Features

- Miniature Construction
- Power Consumption of 2mA at VCC=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)

Applications

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

Pin Configuration



Functional Pin Description

Pin No.	Symbol	Description
1	VCC	Supply Voltage
2	OUT	Open Drain Output
3	GND	Ground

Ordering Information

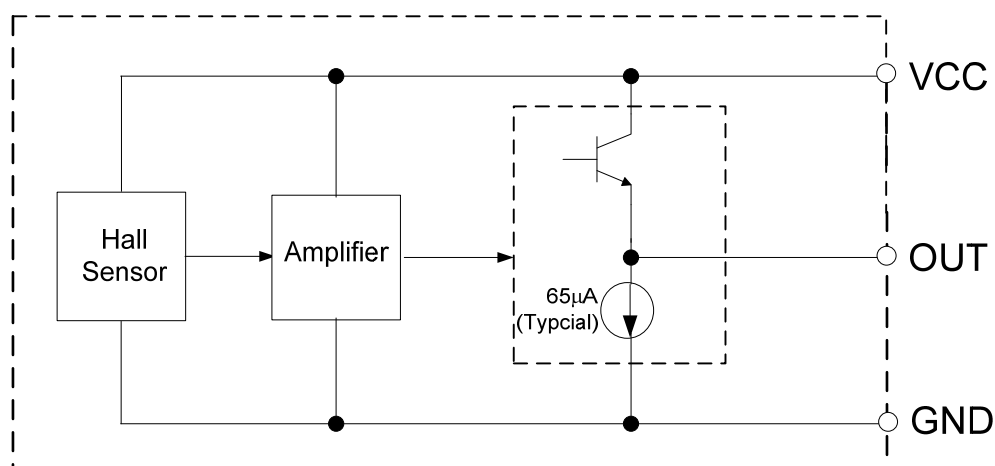
Part Number	Package	Lead Free	RoHS & Green	MSL3	Marking
AH49HSC	SOT-23-3	7	3000	RoHS & Green	MSL3

RoHS:

RoHS: PJ defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials.

Green: PJ defines "Green" to mean Halogen-Free and Antimony-Free.

Function Block Diagram



Absolute Maximum Ratings ^{Note1}

Ratings at 25°C ambient temperature unless otherwise specified.

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 ~ +125	°C
Storage Temperature Range	T_{STG}	-50 ~ +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 these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. “Absolute Maximum Ratings” for extended period may affect device reliability.

Recommended Operating Conditions

Ratings at 25°C ambient temperature unless otherwise specified.

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

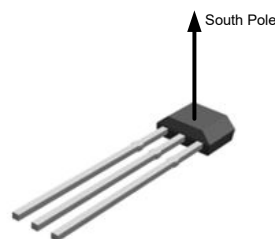
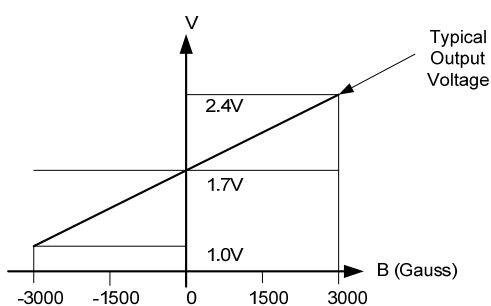
Electrical Characteristics

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

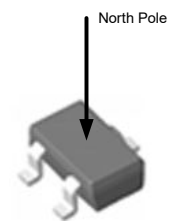
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Current	I_{CC}		1.2	2	3.2	mA
Quiescent Output Voltage	V_{NULL}	$B= (0 \text{ Gauss})$	1.45	1.7	1.85	V
Output Voltage Sensitivity	V_{SEN}	$B=\pm 600 \text{ (Gauss)}$	--	0.33	--	mV/Gauss
Output Voltage Span	V_{OUT_S}		--	0.85~2.6	--	V
Output Resistance	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 ($B=0\text{Gauss}$), 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.



For TO-92

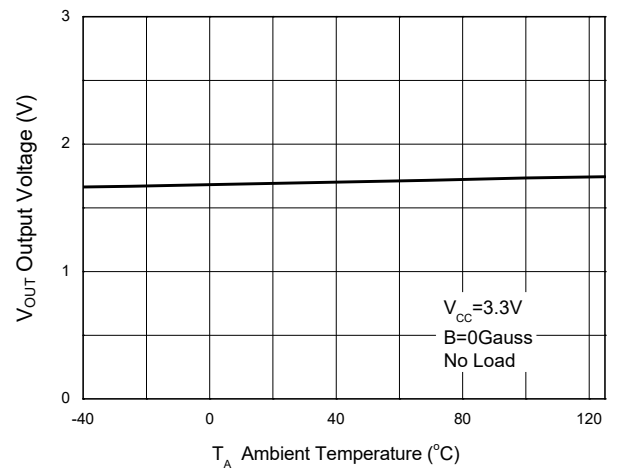
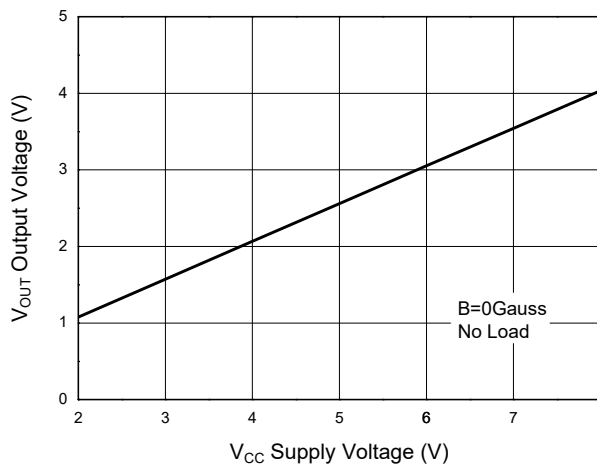
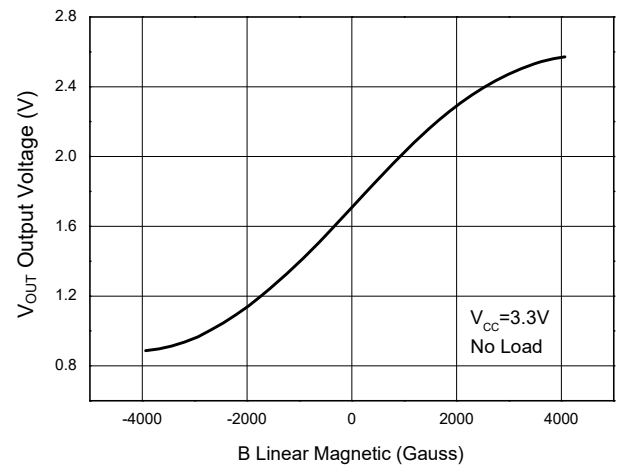
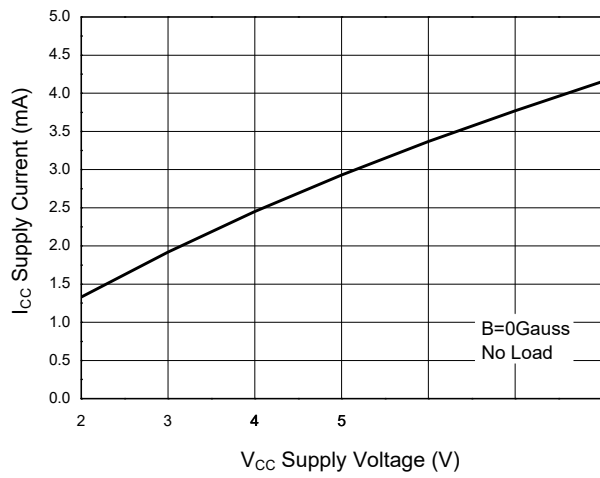


For SOT-23-3

Transferring Characteristic of AH49HSC



Typical Characteristics Curves



Package Outline

SOT-23-3

Dimensions in mm

