

RATIOMETRIC, LINEAR HALL-EFFECT SENSOR IC
WITH REVERSE POLARITY PROTECTION

GH149E

◆ General Description

The GH1194 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. 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 85°C, appropriate for commercial, consumer and industrial applications.

The GH1194 is available in standard TO-92S(SIP-3L) and SOT-23-3L packages.

◆ Features

- Power Supply Voltage Range: 3.0 to 7.5V
- Power Consumption of 5.5mA at $V_{CC}=5V$
- Reverse polarity protection
- 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 of -40°C to 85°C
- Responds to Either Positive or Negative Gauss

◆ Applications

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

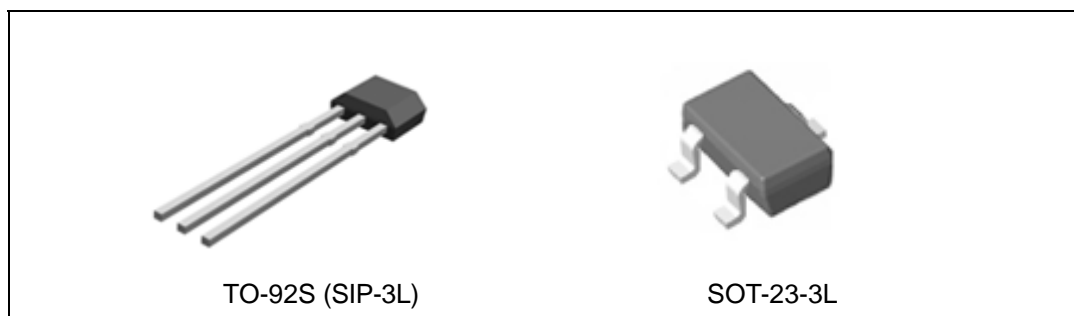


Figure 1. Package Types of GH1194

◆ Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
TO-92S(SIP-3L)	-40 to 85 °C	GH1194EUA	G94E	Bulk
SOT-23-3L	-40 to 85 °C	GH1194ESW	G94E	Tape & Reel

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◆ Pin Configuration

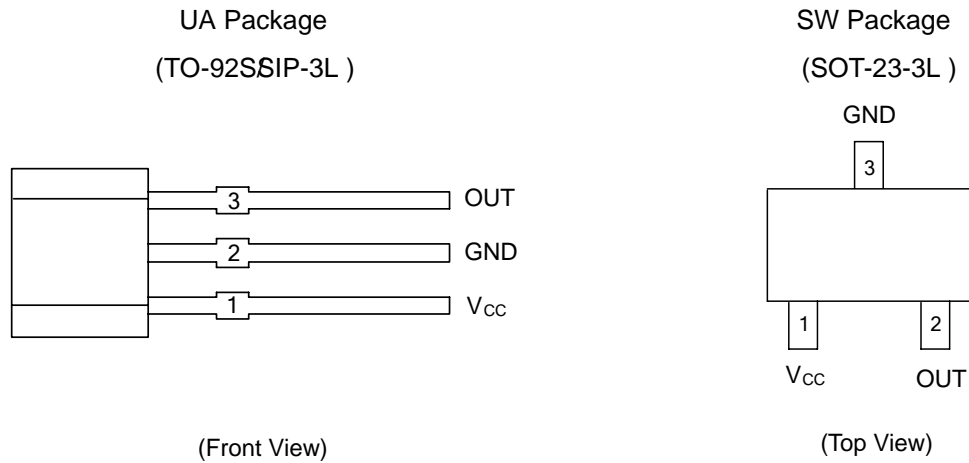
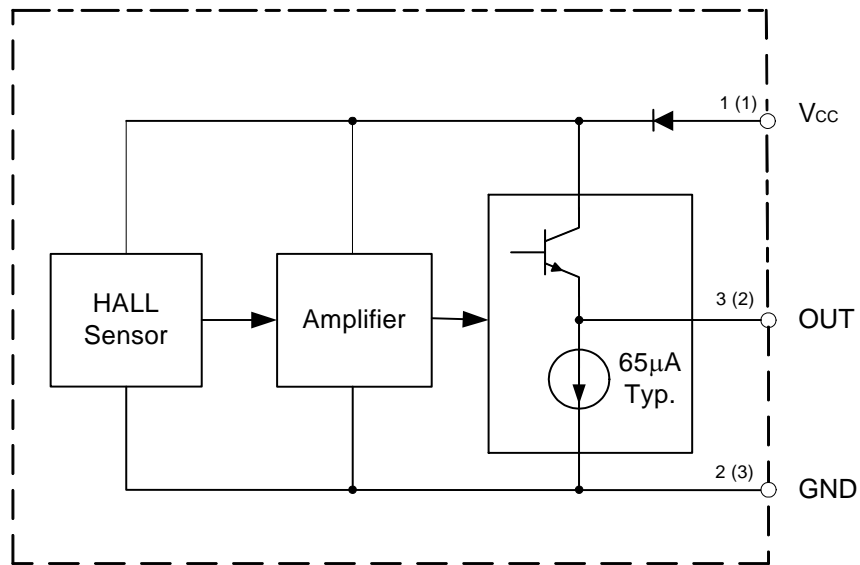


Figure 2. Pin Configuration of GH1194 (Front View)

◆ Pin Description

Pin Number		Pin Name	Function
TO-92S (SIP-3L)	SOT-23-3L		
1	1	V _{CC}	Supply voltage
2	3	GND	Ground pin
3	2	OUT	Output

◆ **Functional Block Diagram**



A (B)
A for TO-92S(SIP-3L)
B for SOT-23-3L

Figure 3. Functional Block Diagram of GH1194

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◆ Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$ (Note 1)

Parameter	Symbol	Condition	Value	Unit
Supply Voltage (Continuous)	$V_{CC(CONT)}$		-12.5 to 12.5	V
Operating Junction temperature	T_J		-40 to 85	$^\circ\text{C}$
Storage temperature	T_{STG}		-55 to 160	$^\circ\text{C}$
Magnetic Flux Density	B		Unlimited	Gauss
IR-Reflow Lead Temperature	T_P	10s	260	$^\circ\text{C}$

◆ Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	V_{CC}	3.0	7.5	V
Operation Temperature	T_A	-40	85	$^\circ\text{C}$

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 above “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

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◆ Electrical Characteristics

($V_{CC}=5V$, $T_A=25^{\circ}C$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Current	I_{CC}			5.5	9.5	mA
Quiescent Output Voltage	V_{NULL}	@ B=0GS	2.25	2.5	2.75	V
Output Voltage Sensitivity		B=0GS to $\pm 900GS$	1.5	2.0	2.5	mV/GS
Output Voltage Span	V_{OS}		0.8		($V_{CC}-0.8$)	V
Output Resistor	R_O			60	120	Ω
Magnetic Field Range	B		± 650	± 900		Gauss
Linearity of Span				0.7		%
Output Noise		BW=10Hz to 10kHz		90		μV

◆ Magnetic Characteristics

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

For TO-92S package, if a south magnetic pole approaches to the front face (the side with marking ID) of the Hall effect sensor, the circuit will drive the output voltage higher. Contrary, a north magnetic pole will drive the output voltage lower. The variations of voltage level up or down are symmetrical. Due to SOT-23-3L is reversed packaging with TO-92S, so the magnetic performance is also reversed. Therefore, if the reversed magnetic pole approaches to the front face (the side with marking ID), the output is the same as TO-92S package.

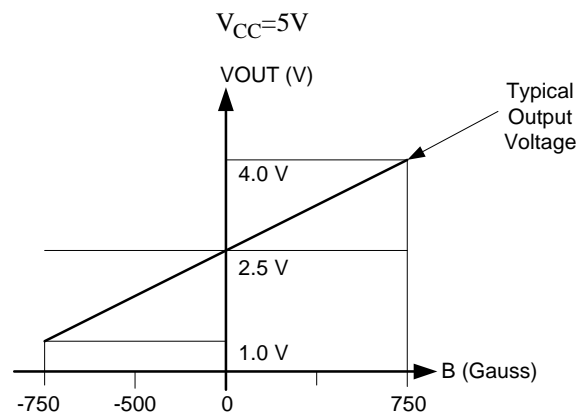
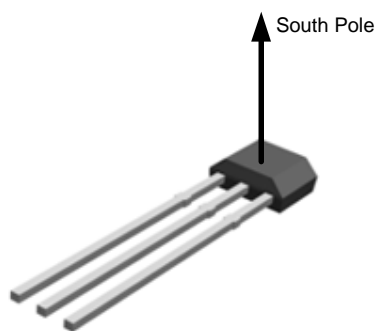
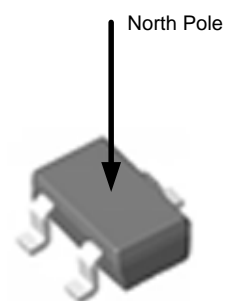


Figure 4. The Transfer Characteristics of GH1194



UA:TO-92S(SIP-3L) Package



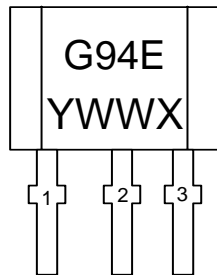
SW: SOT-23-3L Package

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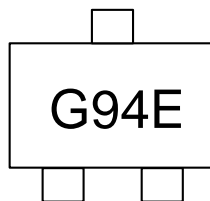
◆ Marking Information

(TO-92S/SIP-3L)



G94E: Part No.
Y: Year, 0~9, ex: "7"=2017
WW: Nth Week, 01~52
X: Internal Code

(SOT-23-3L)

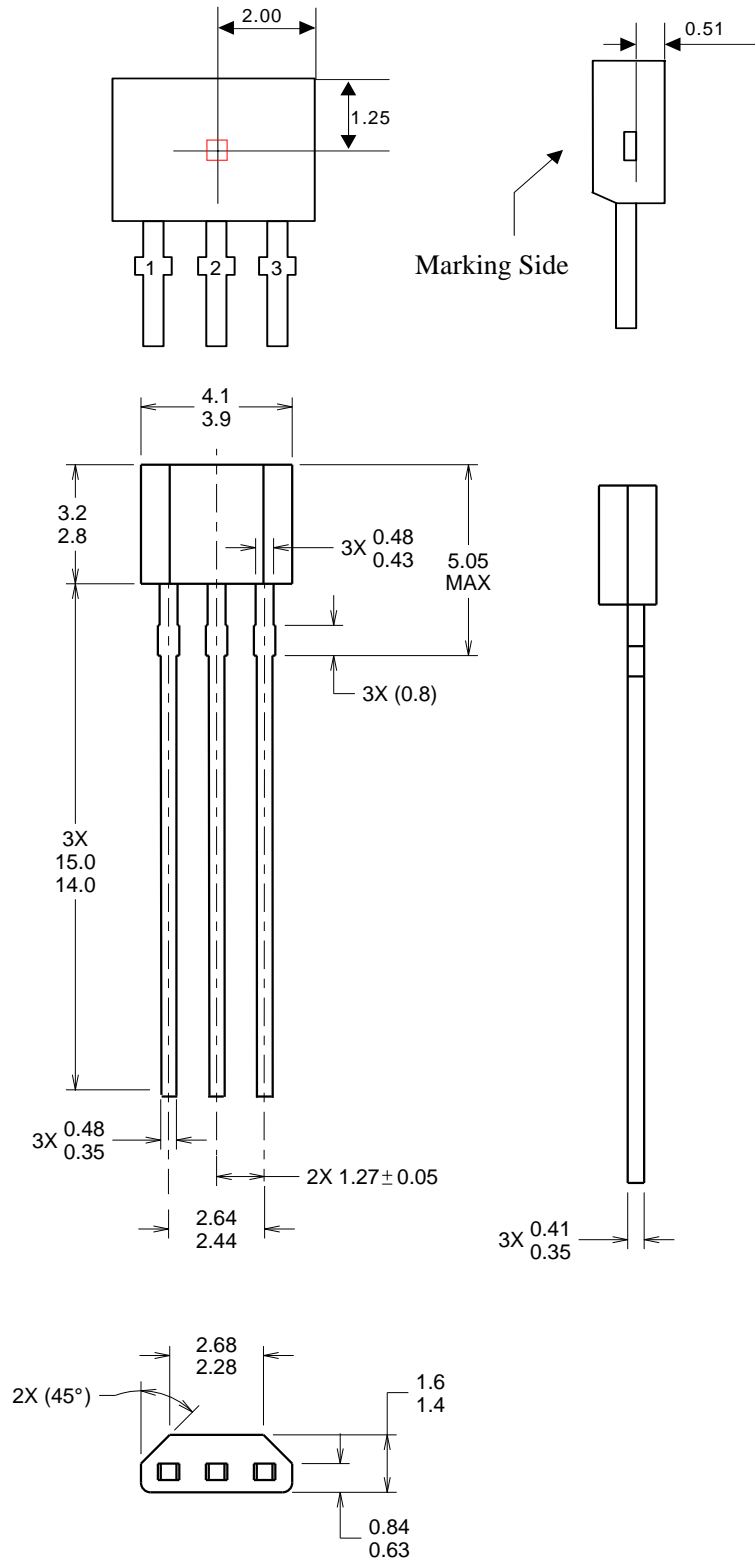


G94E: Part No.

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◆ Package Information (UA: TO-92S/SIP-3L) Unit: mm



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◆ Package Information (Continuous)

(SW: SOT-23-3L) Unit: mm

