

Date Sheet



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The "Huaxin" brand was founded in 2003 and has a history of 18 years. The company is mainly engaged in Hall elements, has a group of senior professional device design, integrated circuit design and test engineers, and has a first-class development and test platform. We have developed a number of high-end products with independent intellectual property rights, such as RF LDMOS series and RF VDMOS series, which represent China's integrated circuit level.

HX6689

Linear Hall Element

HX6689 a linear Hall-effect sensor, is composed of Hall sensor, linear amplifier and Totem-Pole output stage. It features low noise output, which makes it unnecessary to use external filtering. It also can provide increased temperature stability and accuracy. The linear Hall sensor has a wide operating temperature range of -40°C to $+105^{\circ}\text{C}$, appropriate for commercial, consumer, and industrial environments.

The high sensitivity of Hall-effect sensor accurately tracks extremely weak changes in magnetic flux density. The linear sourcing output voltage is set by the supply voltage and in proportion of vary of the magnetic flux density. Typical operation current is 2.5mA and operating voltage range is 3.0 volts to 6.5 volts.

The UA package style available provides magnetically optimized solutions for most applications. The SQ package is a three-lead ultra-mini SMD and ST are the industrial standard package in SMT process.

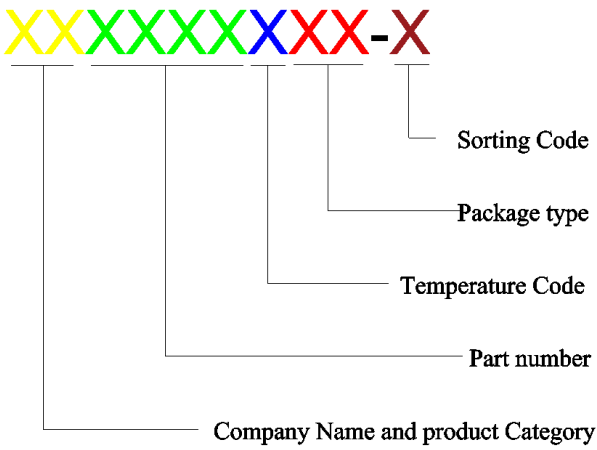
Features and Benefits

- Operating Voltage Range: 3.0V~6.5V
- Power consumption of 2.5 mA at 5 V_{DC} for energy efficiency
- Low-Noise Operation
- Linear output for circuit design flexibility
- Totem-Pole for a stable and accurate output
- Responds to either positive or negative gauss
- Small package for SMD
- Magnetically Optimized Package for SIP
- Cost competitive
- Robust ESD performance

Applications

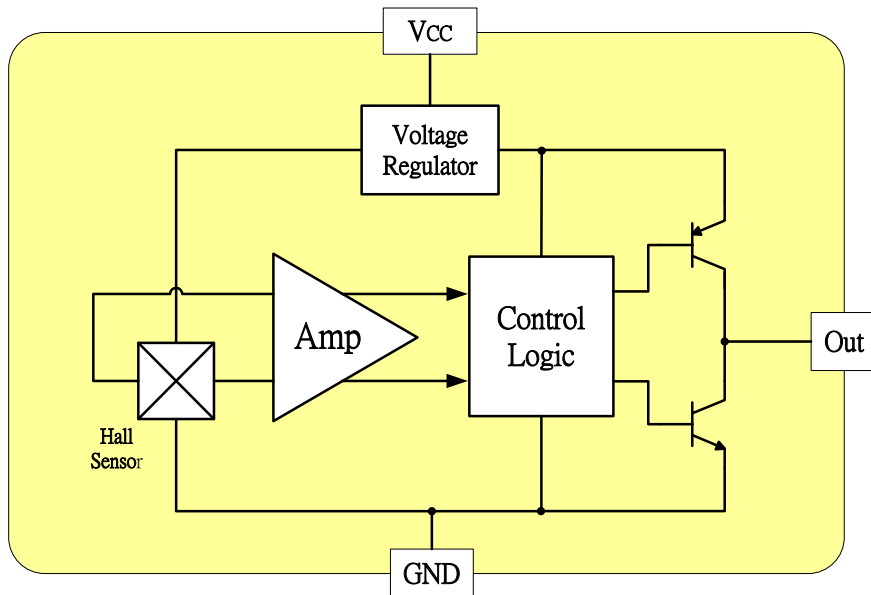
- Current sensing
- Motor control
- Position sensing
- Magnetic code reading
- Rotary encoder
- Ferrous metal detector
- Vibration sensing
- Liquid level sensing
- Weight sensing

Ordering Information

	<p>Company Name and Product Category HX:HX Hall Effect/MP:HX Power IC</p> <p>Part number 6286,6275,6278,6287,6383,6474,6571,6572,6573,6574... If part # is just 3 digits, the forth digit will be omitted.</p> <p>Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p>Package type UA:TO-92S,VK:TO-92S(4pin),VF:TO-92S(5pin),SO:SOT-23, SQ:QFN-3,ST:TSOT-23,SN:SOT-553,SF:SOT-89(5pin), SS:TSOT-26,SD:DFN-6</p> <p>Sorting α, β, Blank.....</p>
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Part No.	Temperature Suffix	PackageType
HX6689IUA	I (-40°C to + 105°C)	UA (TO-92S)
HX6689ISQ	I (-40°C to + 105°C)	SQ (QFN2020-3)
HX6689IST	I (-40°C to + 105°C)	ST(TSOT-23)

Functional Diagram



Absolute Maximum Ratings At ($T_a=25^{\circ}\text{C}$)

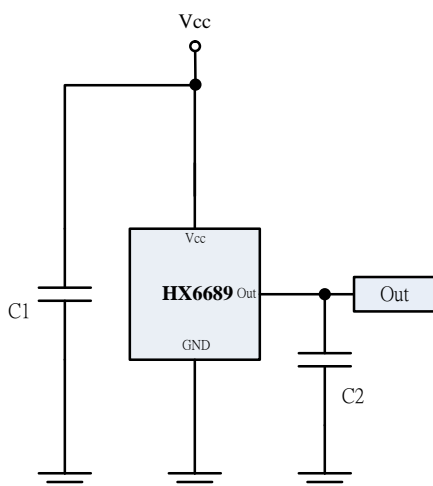
Characteristics		Values	Unit
Supply Voltage, (VCC)		8	V
Reverse Voltage, (VCC)		-0.5	V
Magnetic Flux Density		Unlimited	Gauss
Output Current, (IOUT)		10	mA
Operating Temperature Range, (T_a)	“I” version	-40 to +105	$^{\circ}\text{C}$
Storage temperature range, (T_s)		-65 to +150	$^{\circ}\text{C}$
Maximum Junction Temp, (T_j)		150	$^{\circ}\text{C}$
Thermal Resistance	(θ_{ja}) UA / SQ / ST	206 / 543 / 310	$^{\circ}\text{C}/\text{W}$
	(θ_{jc}) UA / SQ / ST	148 / 410 / 223	$^{\circ}\text{C}/\text{W}$
Package Power Dissipation, (PD)UA / SQ / ST		606 / 230 / 400	mW

Note: Do not apply reverse voltage to Vcc and Vout Pin, It may be caused for Missfunction or damaged device.

Electrical Specifications

DC Operating Parameters: $T_A=+25^{\circ}\text{C}$, $V_{CC}=5.0\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (VCC)	Operating	3.0		6.5	V
Supply Current, (ICC)	B=0 Gauss		2.5	5.0	mA
Output Current, (Io)	Vcc>3V	1.0	1.5		mA
Null Output Voltage, (V_{Null})	B=0 Gauss	2.3	2.5	2.7	V
Output Bandwidth, (Bw)			20		kHz
Output Voltage Span, (V_{os})		2.95	3.2		V
Magnetic Range Gauss		± 500	± 800		Gauss
Linearity	% of Span		0.7		
Response Time			3		μs
Sensitivity		1.8		2.2	mV/G
Electro-Static Discharge	HBM	3			kV

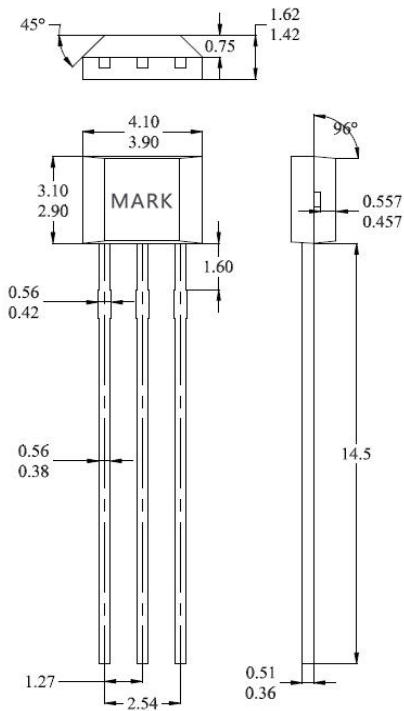
Typical application circuit


C1 : 1000PF

C2 : 10PF

Sensor Location, package dimension and marking

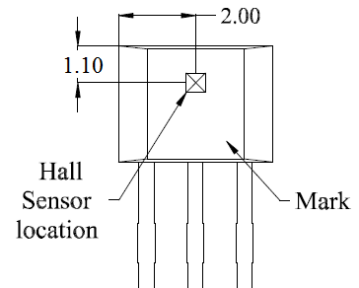
UA Package



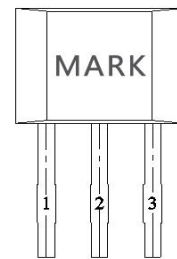
NOTES:

1. Controlling dimension:mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:
Pin 1 VCC
Pin 2 GND
Pin 3 Output

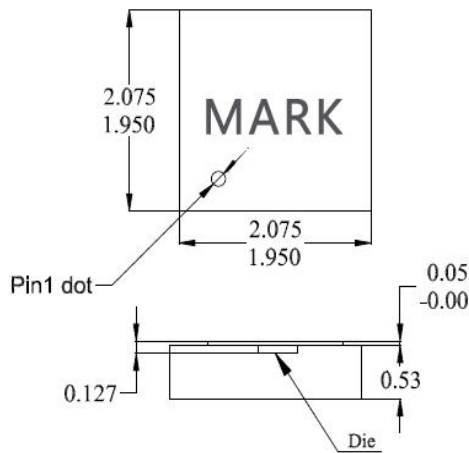
Hall Chip Location



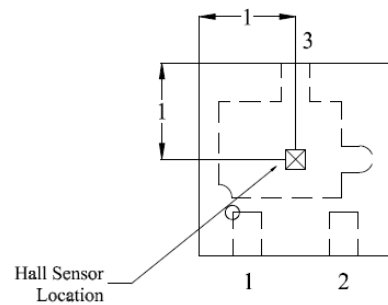
Output Pin Assignment (Top View)



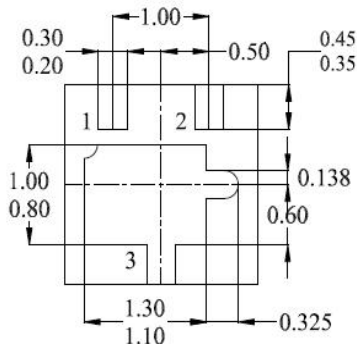
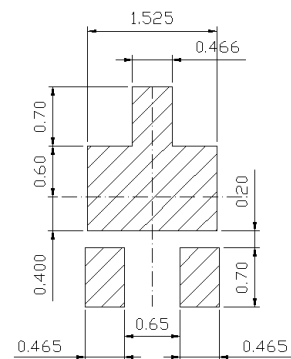
SQ Package



Hall Plate Chip Location (Top View)



(For reference only) Land Pattern

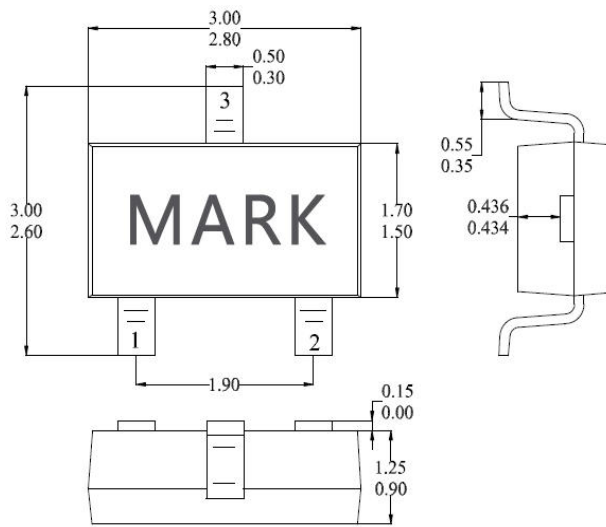


Bottom View

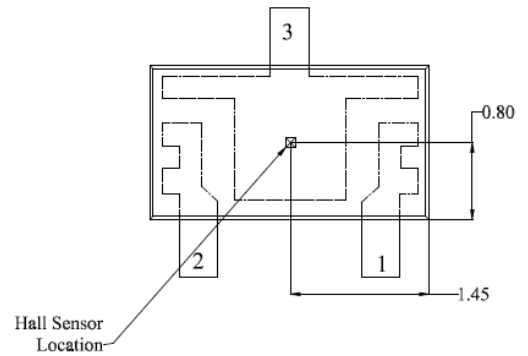
NOTES:

1. PINOUT (See Top View at left)
Pin 1 VCC
Pin 2 Output
Pin 3 GND
2. Controlling dimension: mm;
3. Chip rubbing will be 10mil maximum;
4. Chip must be in PKG. center.

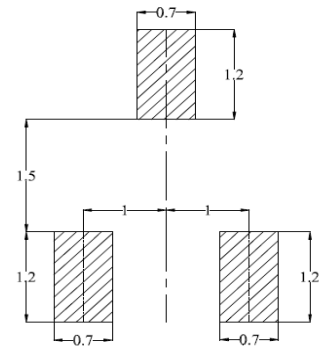
ST Package(TSOT-23)
(Top View)



Hall Plate Chip Location
(Bottom View)



(For reference only) Land Pattern



NOTES:

1. PINOUT (See Top View at left:)
 - Pin 1 VDD
 - Pin 2 Output
 - Pin 3 GND
2. Controlling dimension: mm;

Warm reminder

1. Hall is a sensitive device. Please take electrostatic protection measures during use and storage.

2. During the installation process, the Hall should try to avoid applying mechanical stress to the Hall body. If the pins need to be bent, please operate at a distance of 3 mm from the root of the lead.

3. Recommended soldering temperature: soldering with electric soldering iron, the recommended temperature is 350°C, the longest is 5 seconds.

Wave soldering: The recommended maximum temperature is 260°C, the longest is 3 seconds

Infrared reflow soldering: recommended maximum 245°C, maximum 10 seconds

4. It is not recommended to exceed the parameters in the data sheet. Although the Hall will work normally under the limit parameters, it may cause damage to the Hall or the actual product under extreme conditions for a long time. In order to ensure the normal operation of the Hall and the product For safety and stability, please use it within the scope of the data sheet.

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