

# Date Sheet



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.

## HX6278

# Unipolar Hall Switch

HX6278 is an unipolar Hall effect sensor IC. It incorporates advanced chopper stabilization technology to provide accurate and stable magnetic switch points. The design, specifications and performance have been optimized for applications of solid state switches.

The output transistor will be switched on ( $B_{OP}$ ) in the presence of a sufficiently strong South pole magnetic field facing the marked side of the package. Similarly, the output will be switched off ( $B_{RP}$ ) in the presence of a weaker South field and remain off with “0” field.

The package type is in a Halogen Free version was verified by third party organization. Halogen Free package is available by customer’s option.

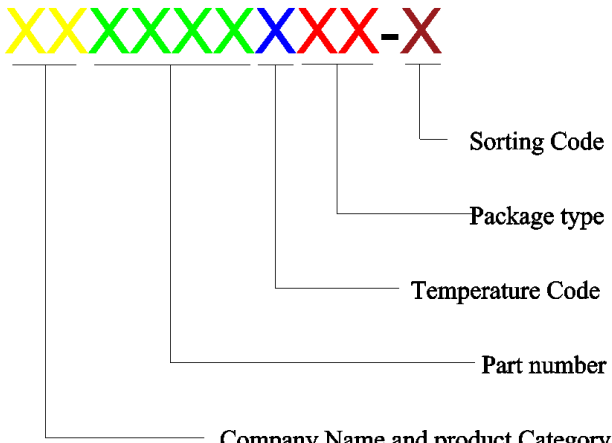
### Features and Benefits

- CMOS Hall IC Technology
- Solid-State Reliability
- Chopper stabilized amplifier stage
- Unipolar, output switches with absolute value of South pole from magnet
- Operation down to 3.0V
- High Sensitivity for direct reed switch replacement applications
- 100% tested at 125°C for K Spec.
- Custom sensitivity / Temperature selection are available.

### Applications

- Solid state switch
- Limit switch
- Current limit
- Interrupter
- Current sensing
- Magnet proximity sensor for reed switch replacement

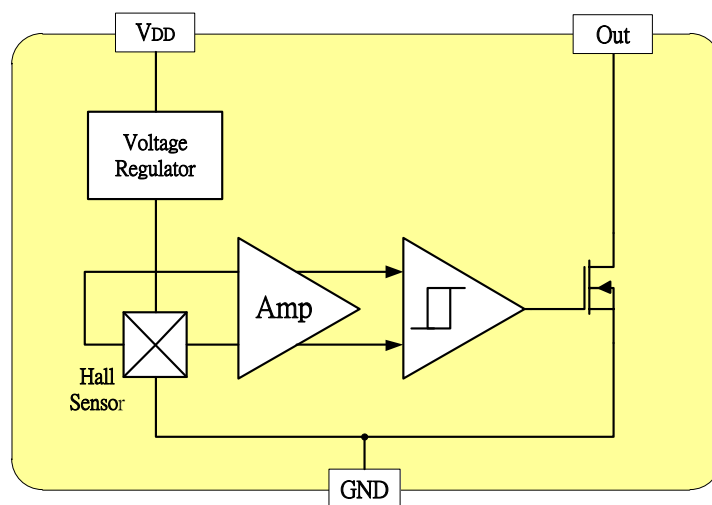
### Ordering Information

	<p><b>Company Name and Product Category</b> HX:HX Hall Effect/MP:HX Power IC</p> <p><b>Part number</b> 6286,6275,6278,6287,6383,6474,6571,6572,6573,6574... If part # is just 3 digits, the forth digit will be omitted.</p> <p><b>Temperature range</b> E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p><b>Package type</b> 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><b>Sorting</b> <math>\alpha, \beta</math>,Blank.....</p>
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Part No.	Temperature Suffix	Package Type
HX6278KUA	K (-40°C to +125°C)	UA (TO-92S)
HX6278KSO	K (-40°C to +125°C)	SO (SOT-23)
HX6278EUA	E (-40°C to +85°C)	UA (TO-92S)
HX6278ESO	E (-40°C to +85°C)	SO (SOT-23)

*KUA spec is using in industrial and automotive application. Special Hot Testing is utilized.*

### Functional Diagram



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

Characteristics	Values	Unit
Supply voltage, ( $V_{DD}$ )	27	V
Output Voltage, ( $V_o$ )	27	V
Reverse Voltage, ( $V_{DD}$ ) ( $V_{OUT}$ )	-0.3	V
Magnetic flux density	Unlimited	Gauss
Output current, ( $I_{OUT}$ )	50	mA
Operating Temperature Range, ( $T_a$ )	“E” version	-40 to +85
	“K” version	-40 to +125
Storage temperature range, ( $T_s$ )	-55 to +150	°C
Maximum Junction Temp, ( $T_j$ )	150	°C
Thermal Resistance	( $\theta_{ja}$ ) UA / SO	206 / 543
	( $\theta_{jc}$ ) UA / SO	148 / 410
Package Power Dissipation, ( $P_D$ ) UA / SO	606 / 230	mW

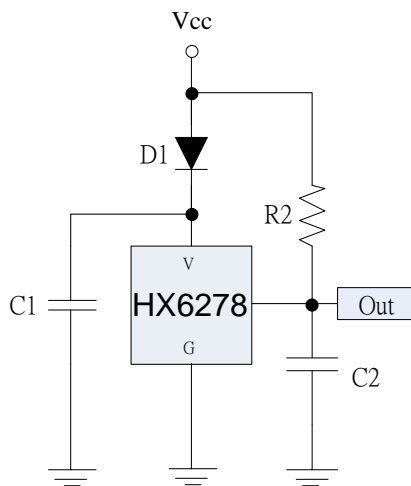
**Note:** Do not apply reverse voltage to  $V_{DD}$  and  $V_{OUT}$  Pin, It may be caused for Miss function or damaged device.

**Electrical Specifications**

DC Operating Parameters :  $T_A = +25\text{ }^\circ\text{C}$ ,  $V_{DD} = 12\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, ( $V_{DD}$ )	Operating	3.0		24.0	V
Supply Current, ( $I_{DD}$ )	$B < B_{OP}$		2.5	5.0	mA
Output Saturation Voltage, ( $V_{Sat}$ )	$I_{OUT} = 20\text{ mA}$ , $B > B_{OP}$			500.0	mV
Output Leakage Current, ( $I_{off}$ )	$I_{OFF} B < B_{RP}$ , $V_{OUT} = 20\text{V}$			10.0	uA
Output Rise Time, ( $TR$ )	$R_L = 1\text{ k}\Omega$ , $C_L = 20\text{ pF}$		0.04		uS
Output Fall Time, ( $TF$ )	$R_L = 1\text{ k}\Omega$ ; $C_L = 20\text{ pF}$		0.18		uS
Operate Point, ( $B_{OP}$ )			175	200	Gauss
Release Point, ( $B_{RP}$ )		95			Gauss
Hysteresis, ( $B_{HYS}$ )			45		Gauss

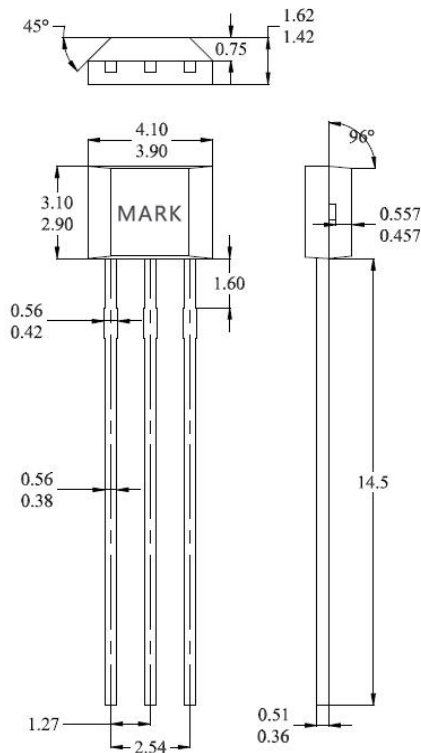
**Typical application circuit**



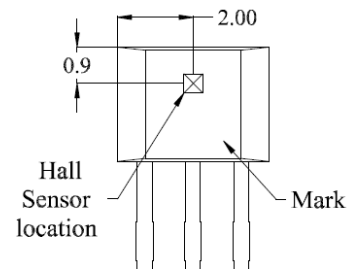
- D1 : 1N4148 or 100Ω
- C1 : 1000PF
- C2 : 15PF
- R2 : 10KΩ

**Sensor Location, Package Dimension and Marking**

**UA Package**



**Hall Chip Location**

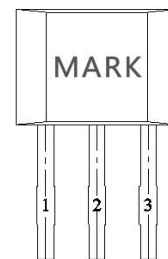


**NOTES:**

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.

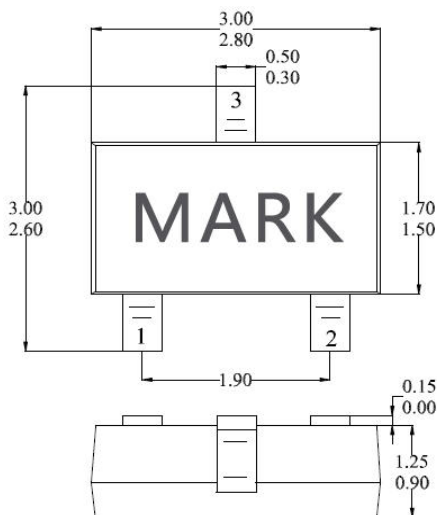
**4. PINOUT:**

- Pin 1      VCC
- Pin 2      GND
- Pin 3      Output



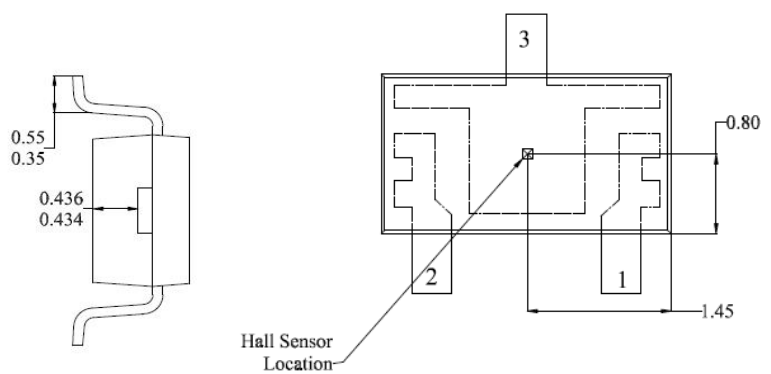
**SO Package**

**(Top View)**

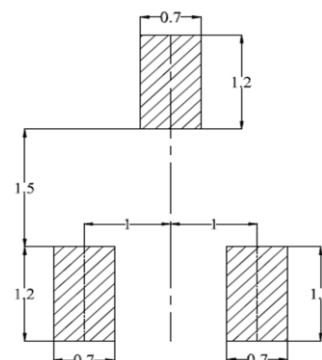


**Hall Plate Chip Location**

**(Bottom View)**



**(For reference only) Land Pattern**



**NOTES:**

1. PINOUT (See Top View at left :)  
Pin 1    V<sub>CC</sub>  
Pin 2    Output  
Pin 3    GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum

### 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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[www.wxhjkj.com](http://www.wxhjkj.com)

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**Huaxin has the final right to interpret the above product data**