

## Internal Pull-up Hall Effect Latch For High Temperature

### ■ Features

- Bipolar Hall effect latch sensor
- 3V to 20V DC operation voltage
- Built-in pull-up resistor
- 25mA output sink current
- Operating temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Package: SIP3, SOT23

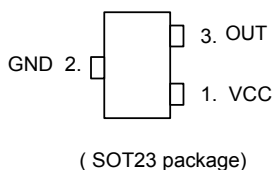
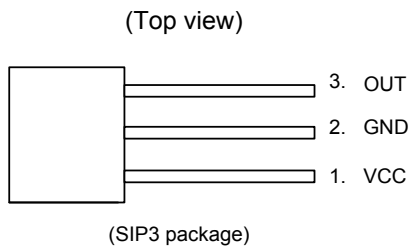
### ■ Applications

- Rotor position sensing
- Current switch
- Encoder
- RPM detection

### ■ General Description

AH173 is a single-digital-output Hall-effect sensor with pull-up resistor for high temperature operation. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier to amplify Hall voltage, and a comparator to provide switching hysteresis for noise rejection, and an output driver with a pull-up resistor (Rpu). An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. While the magnetic flux density (B) is larger than operate point (Bop), the OUT pin turns on (low). If B moves toward release point (Brp), the OUT pin is latched "on" state prior to  $B < \text{Brp}$ . When  $B < \text{Brp}$ , the OUT pin go into " off " state.

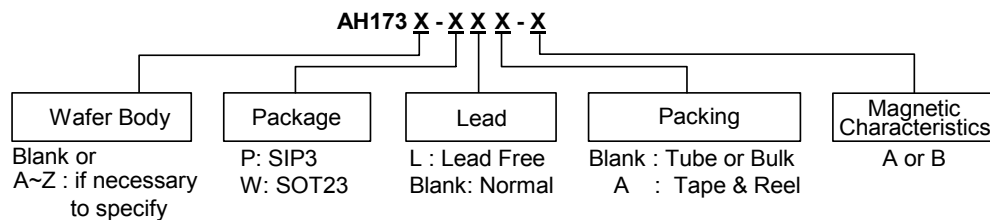
### ■ Pin Assignment



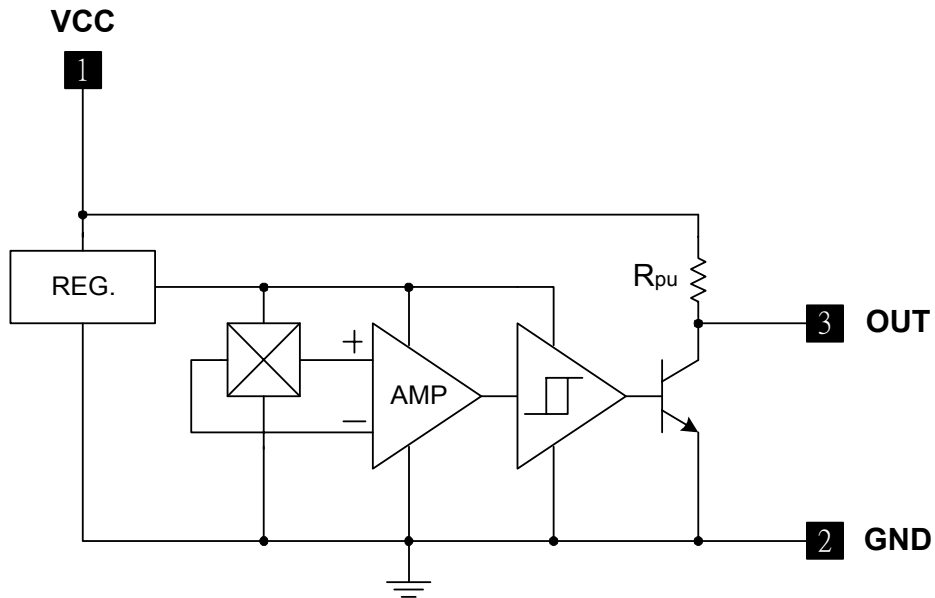
### ■ Pin Descriptions

Name	Description
VCC	Positive power supply
GND	Ground
OUT	Output stage

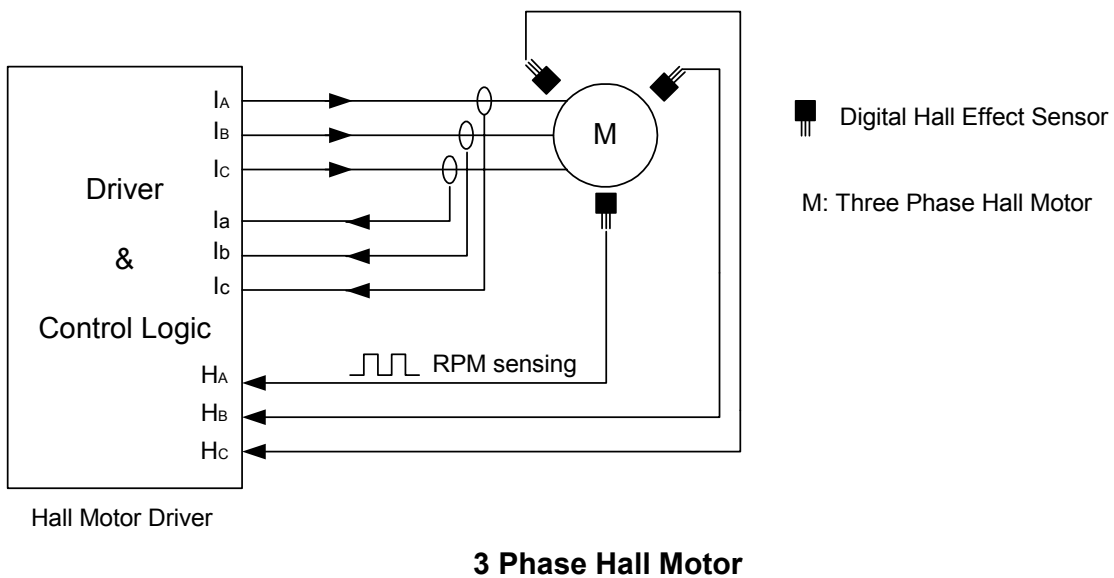
### ■ Ordering Information



### ■ Block Diagram



### ■ Functional Application Circuit



## Internal Pull-up Hall Effect Latch For High Temperature

### ■ Absolute Maximum Ratings ( at Ta= 25°C )

Characteristics	Symbol	Values	Unit
Supply voltage	VCC	20	V
Output "off" voltage	V <sub>out (off)</sub>	20	V
Output "on" current	I <sub>o (sink)</sub>	25	mA
Operating temperature range	T <sub>op</sub>	-40~+125	°C
Storage temperature range	T <sub>stg</sub>	-65~+150	°C
Power dissipation	SIP	PD	550
	SOT23		230

### ■ Electrical Characteristics ( Ta= 25°C )

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	—	3	-	20	V
Output saturation voltage	V <sub>out(sat)</sub>	VCC=12V, OUT "ON" I <sub>o</sub> =10mA	-	300	400	mV
Supply current	I <sub>cc</sub>	VCC=12V, OUT "OFF"	-	3.5	6	mA
Internal pull-up resistor	R <sub>pu</sub>	—	7	10	13	KΩ
Dropout voltage	V <sub>d</sub>	V <sub>d</sub> = V <sub>cc</sub> -V <sub>ce</sub>	-	-	0.3	V

### ■ Magnetic Characteristics (At Ta= 25°C )

(1mT = 10 Gauss)

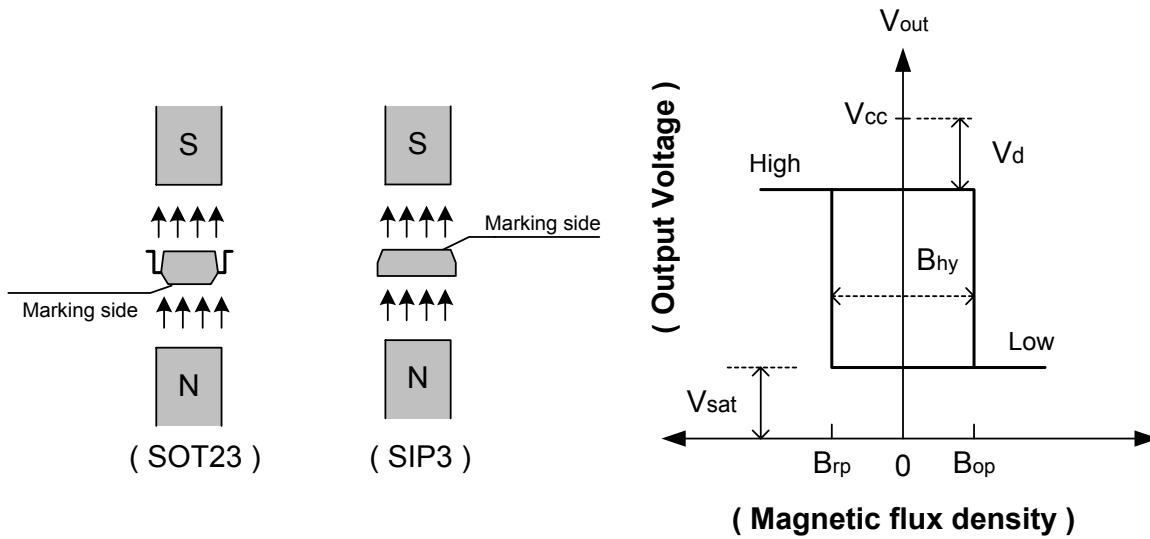
#### A grade

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B <sub>op</sub>	15	-	60	Gauss
Release Point	B <sub>rp</sub>	-60	-	-15	Gauss
Hysteresis	B <sub>hy</sub>	-	80	-	Gauss

#### B grade

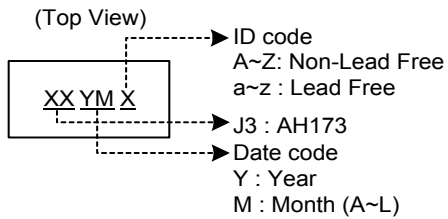
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B <sub>op</sub>	5	-	80	Gauss
Release Point	B <sub>rp</sub>	-80	-	-5	Gauss
Hysteresis	B <sub>hy</sub>	-	80	-	Gauss

### ■ Operating Characteristics

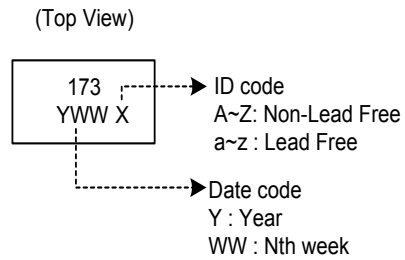


### ■ Marking Information

(1) SOT23



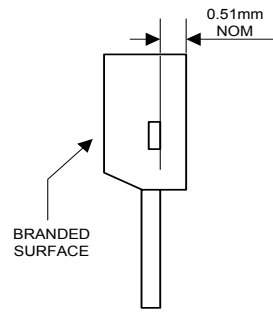
(2) SIP3



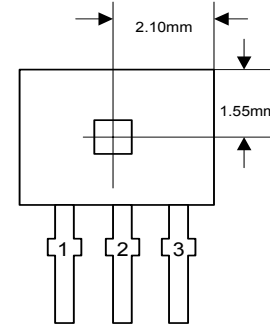
## Internal Pull-up Hall Effect Latch For High Temperature

### ■ Package Information

(1) Package Type: SIP-3L

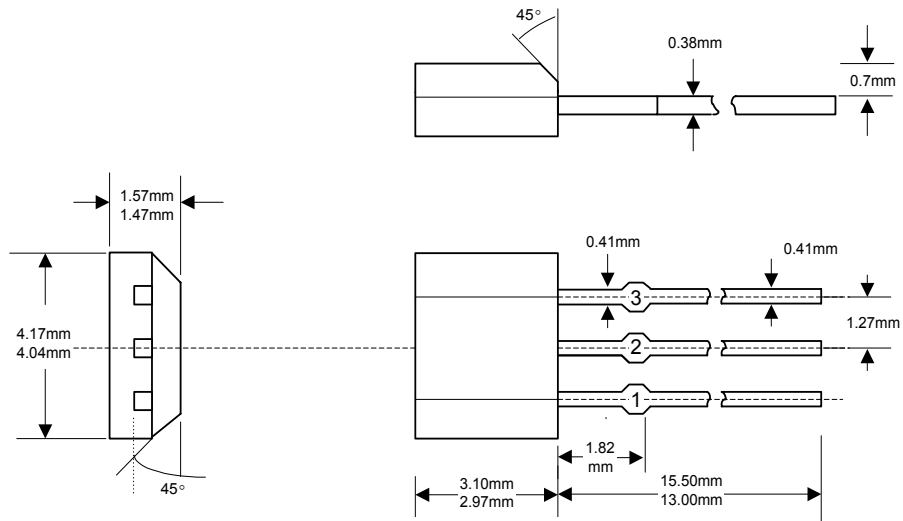


Active Area Depth



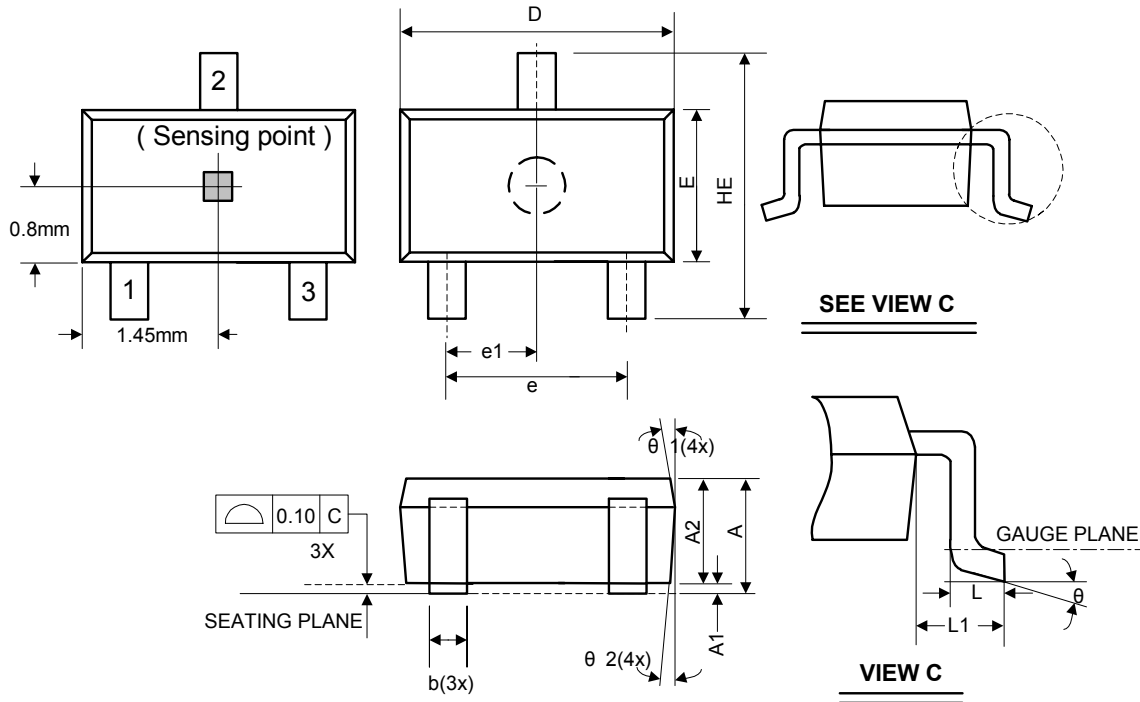
Sensor Location

### Package Dimension



## Internal Pull-up Hall Effect Latch For High Temperature

(2) Package Type: SOT23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.55	0.012	-	0.022
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
$\theta$	0°	5°	10°	0°	5°	10°
$\theta_1$	3°	5°	7°	3°	5°	7°
$\theta_2$	6°	8°	10°	6°	8°	10°