

Inverted Output Hall Effect Latch For High Temperature

■ Features

- Bipolar Hall effect latch sensor
- 3.5V to 20V DC operation voltage
- Open collector pre-driver
- 25mA output sink current
- Chip power reverse-connection protection
- Operating temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Package: SIP3, SOT23

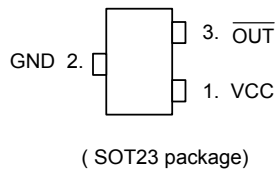
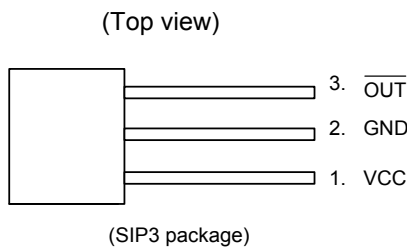
■ Applications

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

■ General Description

AH174 is a single-digital-output Hall-effect sensor 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 open-collector output pre-driver. 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 threshold B_{op} , the $\overline{\text{OUT}}$ pin turns off (High). If B removed toward B_{rp} , the $\overline{\text{OUT}}$ pin is latched "off" state prior to $B < B_{rp}$. When $B < B_{rp}$, the $\overline{\text{OUT}}$ pin go into "on" state.

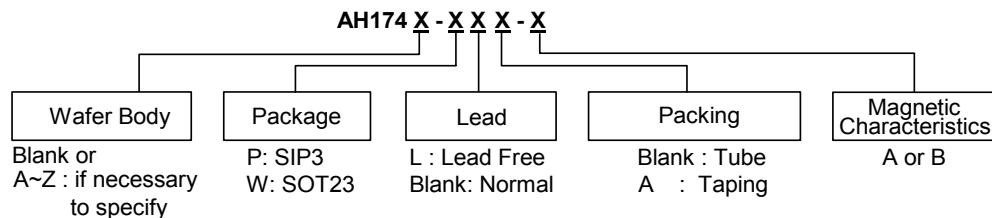
■ Pin Assignment



■ Pin Descriptions

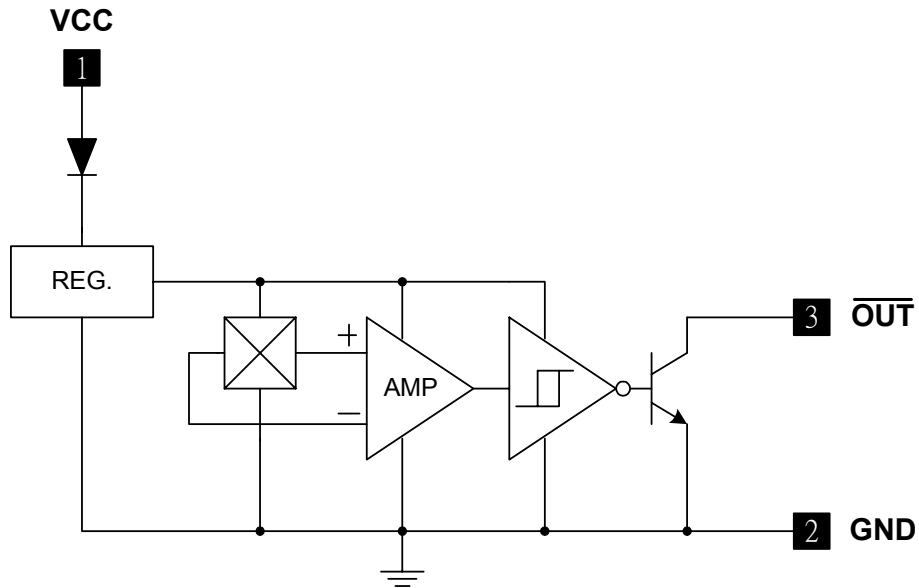
Name	Description
VCC	Input power
GND	Ground
$\overline{\text{OUT}}$	Inverted output stage

■ Ordering Information

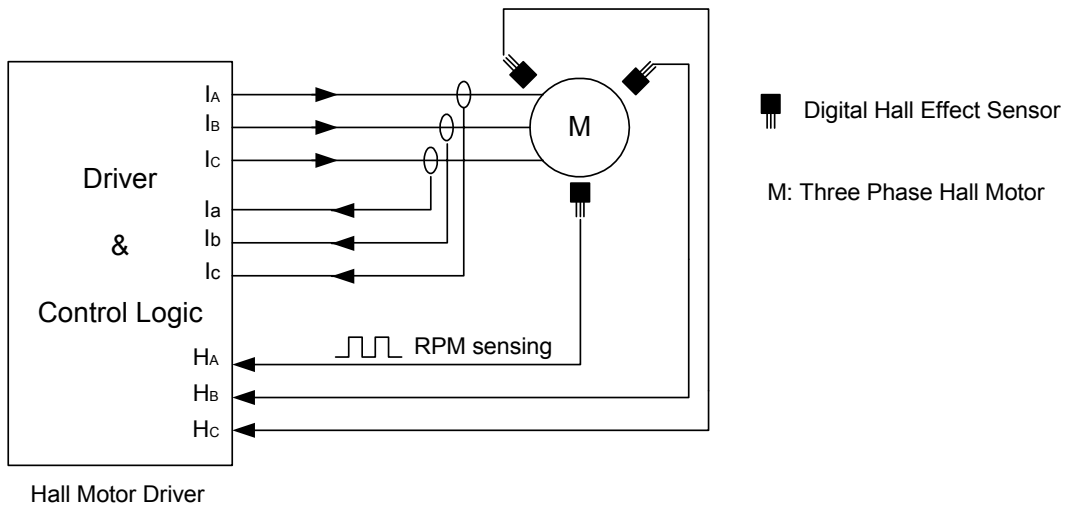


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■ Block Diagram



■ Application Circuit



Three Phase Hall Motor

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

Characteristics	Symbol	Rating	Unit
Supply voltage	VCC	20	V
Output "off" voltage	V _{out (off)}	20	V
Output "on" current	I _{o (sink)}	25	mA
Operating Temperature range	T _{opt}	-40~+125	°C
Storage Temperature range	T _{stg}	-65~+150	°C
Power Dissipation	SIP	PD	550
	SOT23		230

■ Electrical Characteristics (Ta= 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	V _{cc}	—	3.5	-	20	V
Output saturation voltage	V _{out(sat)}	VCC=12V, $\overline{\text{OUT}}$ "ON" I _o =10mA	-	300	400	mV
Supply current	I _{cc}	VCC=12V, $\overline{\text{OUT}}$ "OFF"	-	3.5	6	mA

■ Magnetic Characteristics (Ta= 25°C)

(1mT = 10 Gauss)

A grade

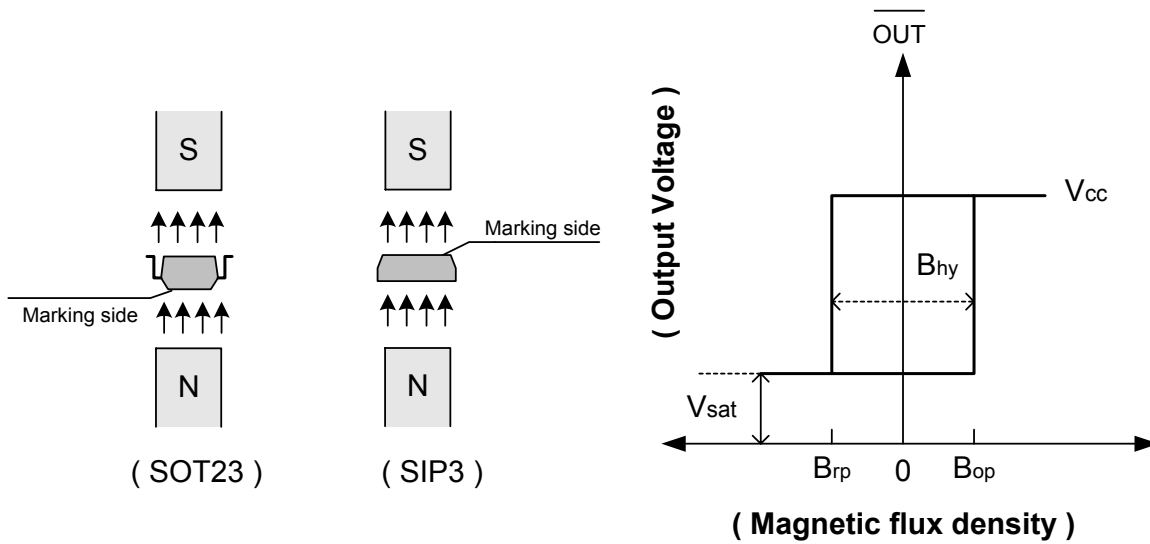
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B _{op}	15	-	60	Gauss
Release Point	B _{rp}	-60	-	-15	Gauss
Hysteresis	B _{hy}	-	80	-	Gauss

B grade

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B _{op}	5	-	80	Gauss
Release Point	B _{rp}	-80	-	-5	Gauss
Hysteresis	B _{hy}	-	80	-	Gauss

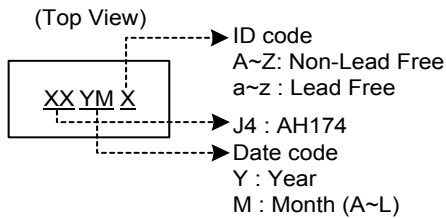
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■ Operating Characteristics

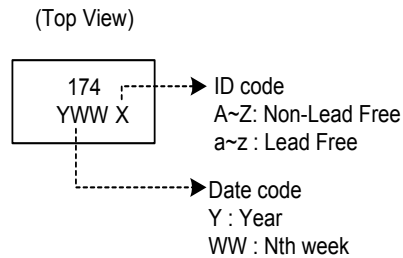


■ Marking Information

(1) SOT23



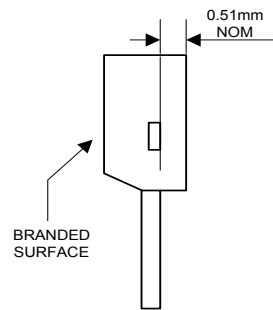
(2) SIP3



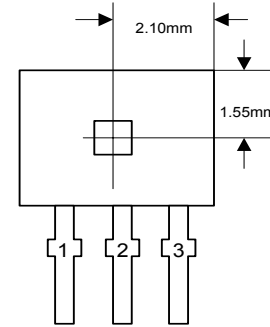
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■ Package Information

(1) Package Type: SIP-3L

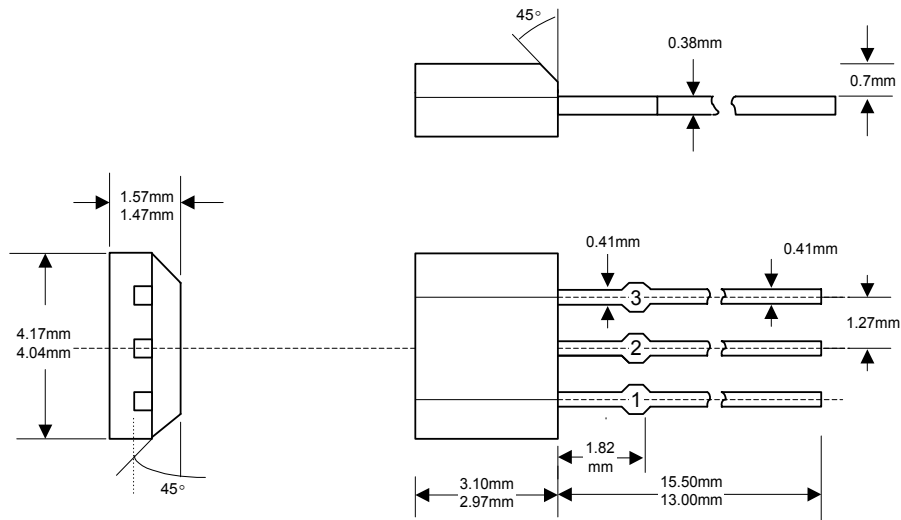


Active Area Depth



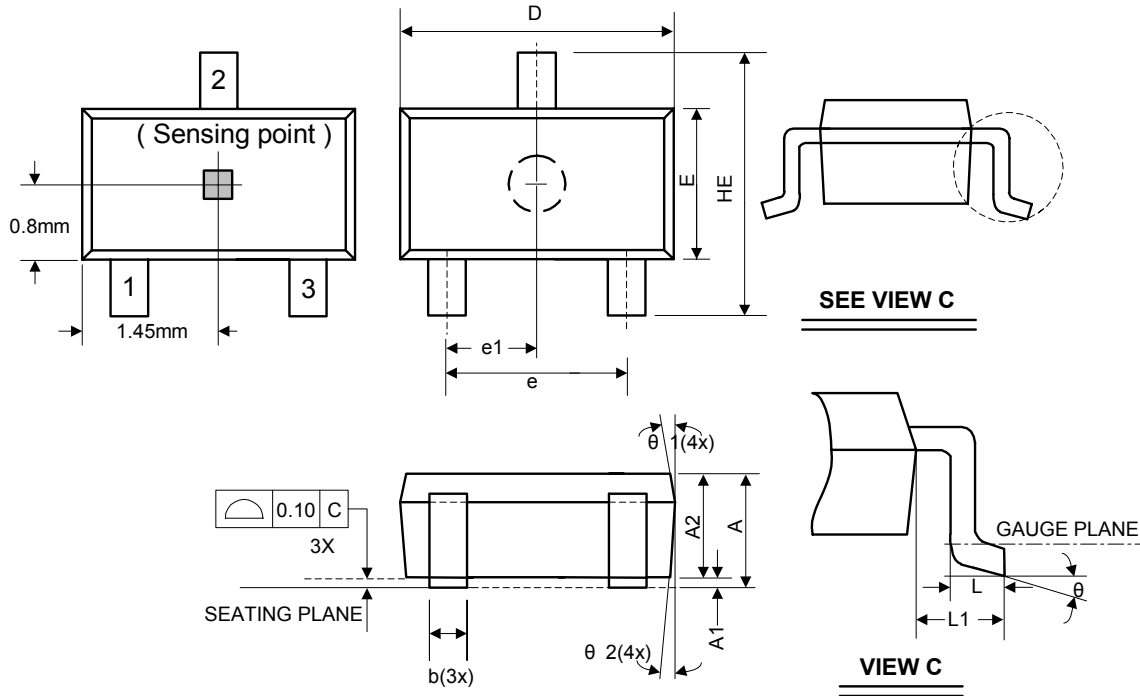
Sensor Location

Package Dimension



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(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
θ	0°	5°	10°	0°	5°	10°
θ_1	3°	5°	7°	3°	5°	7°
θ_2	6°	8°	10°	6°	8°	10°