

Features

- Bipolar Hall Effect Latch Sensor
- 3V to 20V DC Operation Voltage
- Built-in Pull-Up Resistor
- 25mA Output Sink Current
- Operating Temperature: -40°C ~ +125°C
- Lead Free Packages: SC59-3L and SIP-3L (Note 1)
- SC59-3L (commonly known as SOT23 in Asia): Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 2)

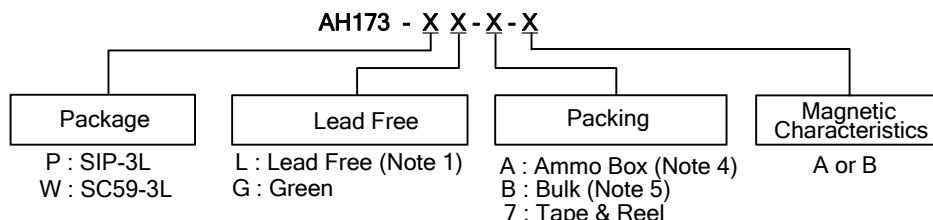
General Description

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 band-gap 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 < Brp. When B < Brp, the OUT pin goes into "off" state.

Applications

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection

Ordering Information



Device	Package Code	Packaging (Note 3)	Tube/Bulk		7" Tape and Reel		Ammo Box		Magnetic Characteristics
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix	
AH173-PL-A-A	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	A
AH173-PL-A-B	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	B
AH173-PL-B-A	P	SIP-3L	1000	-B	NA	NA	NA	NA	A
AH173-PL-B-B	P	SIP-3L	1000	-B	NA	NA	NA	NA	B
AH173-WL-7-A	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA	A
AH173-WL-7-B	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA	B
AH173-WG-7-A	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA	A
AH173-WG-7-B	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA	B



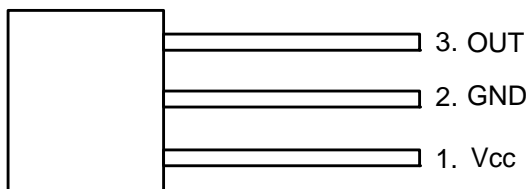
- Notes:
1. SIP-3L is available in "Lead Free" product only.
 2. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.
 3. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 4. Ammo Box is for SIP-3L Spread Lead.
 5. Bulk is for SIP-3L Straight Lead.

Pin Assignment

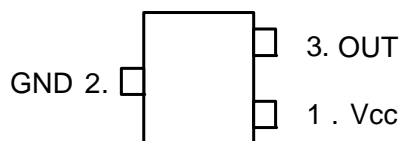
(1) SIP-3L

(2) SC59-3L

(Top View)



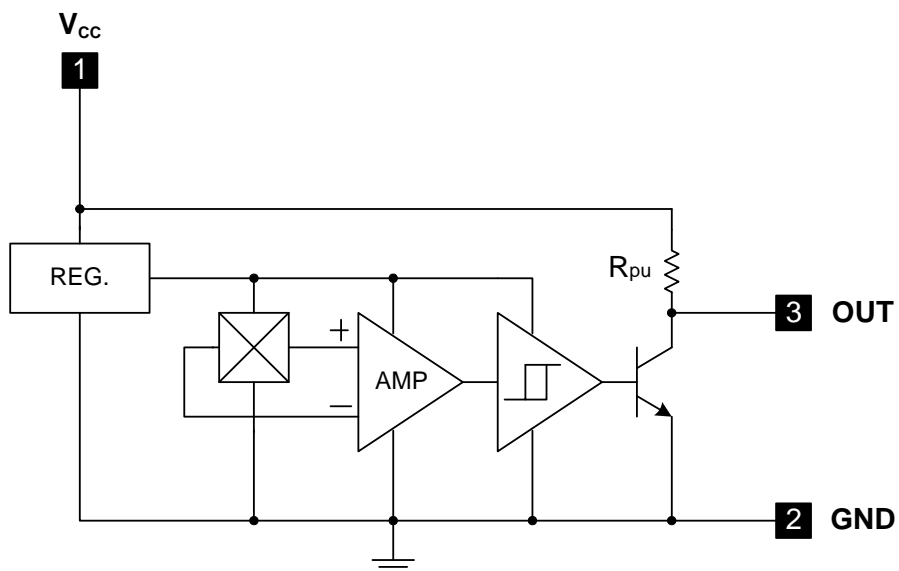
(Top View)



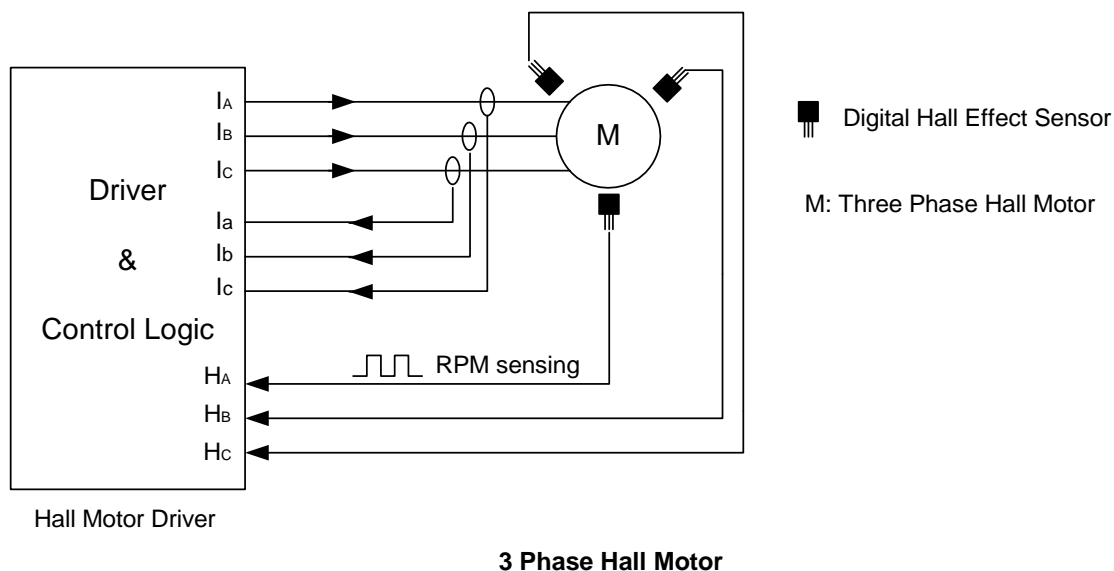
Pin Descriptions

Pin Name	Pin #	Description
Vcc	1	Positive Power Supply
GND	2	Ground
OUT	3	Output Stage

Block Diagram



Functional Application Circuit



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

Symbol	Characteristics	Values	Unit	
V_{CC}	Supply Voltage	20	V	
$V_{OUT (off)}$	Output "Off" Voltage	20	V	
$I_O (sink)$	Output "On" Current	25	mA	
T_S	Storage Temperature Range	-65~+150	$^\circ\text{C}$	
T_J	Maximum Junction Temperature	+150	$^\circ\text{C}$	
P_D	Power Dissipation	SIP-3L	550	mW
		SC59-3L	230	mW

Recommended Operating Conditions

Symbol	Characteristic	Conditions	Min	Max	Unit
V_{CC}	Supply Voltage	Operating	3	20	V
T_A	Operating Ambient Temperature	Operating	-40	125	$^\circ\text{C}$

Electrical Characteristics (T_A = 25°C)

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
V _{OUT (SAT)}	Output Saturation Voltage	V _{CC} = 12V, OUT "ON" I _O = 10mA	-	300	400	mV
I _{CC}	Supply Current	V _{CC} = 12V, OUT "OFF"	-	3.5	6	mA
R _{pu}	Internal Pull-up Resistor		7	10	13	KΩ
V _d	Dropout Voltage	V _d = V _{CC} - V _{Ce}	-	-	0.3	V

Magnetic Characteristics (T_A = 25°C, V_{CC} = 12V)

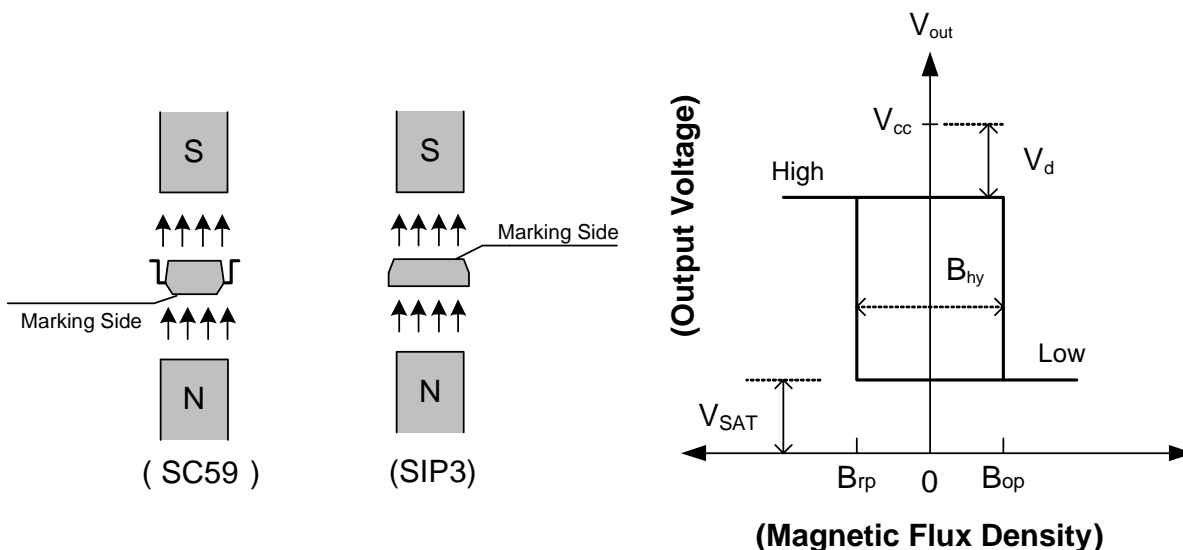
(1mT = 10 Gauss)

A grade

Symbol	Characteristics	Min	Typ.	Max	Unit
B _{ops} (south pole to brand side)	Operation Point	15	-	60	Gauss
B _{rps} (south pole to brand side)	Release Point	-60	-	-15	Gauss
B _{hy} (B _{opx} - B _{rpx})	Hysteresis	-	80	-	Gauss

B grade

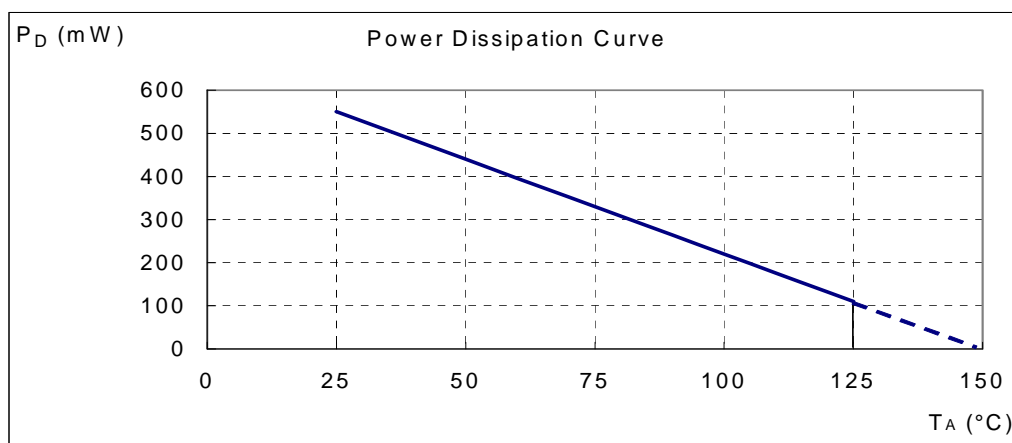
Symbol	Characteristics	Min	Typ.	Max	Unit
B _{ops} (south pole to brand side)	Operation Point	5	-	80	Gauss
B _{rps} (south pole to brand side)	Release Point	-80	-	-5	Gauss
B _{hy} (B _{opx} - B _{rpx})	Hysteresis	-	80	-	Gauss



Performance Characteristics

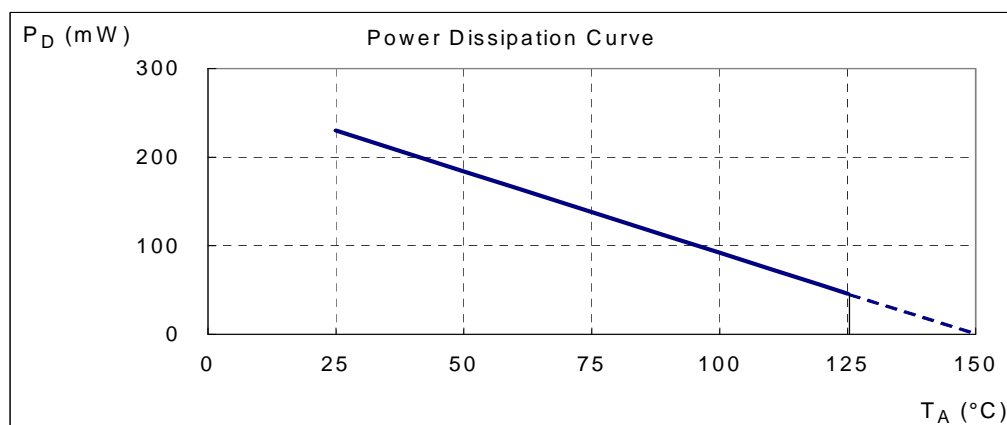
(1) SIP-3L

T_A (°C)	25	50	60	70	80	85	90	95	100
P_D (mW)	550	440	396	352	308	286	264	242	220
T_A (°C)	105	110	115	120	125	130	135	140	150
P_D (mW)	198	176	154	132	110	88	66	44	0



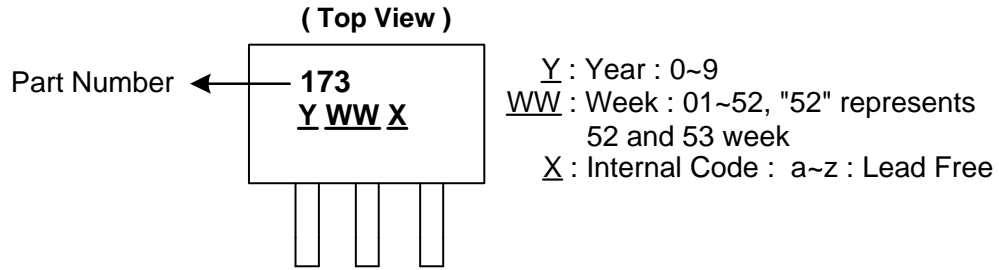
(2) SC59-3L (commonly known as SOT23 in Asia)

T_A (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P_D (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0

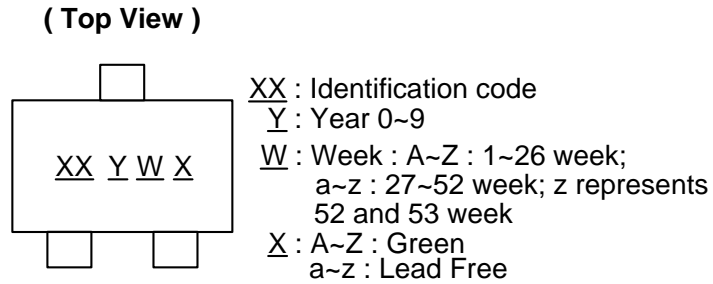


Marking Information

(1) SIP3-3L



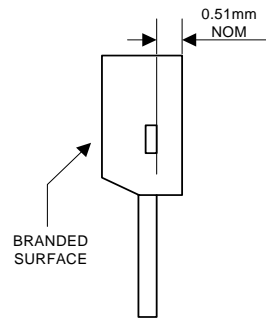
(2) SC59 (Commonly known as SOT23 in Asia)



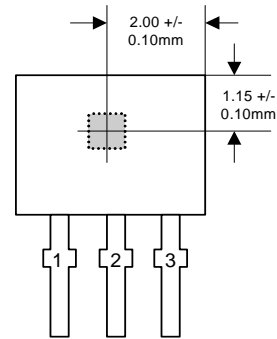
Part Number	Package	Identification Code
AH173	SC59-3L	J3

Package Information (All Dimensions in mm)

(1) Package Type: SIP-3L for Bulk pack

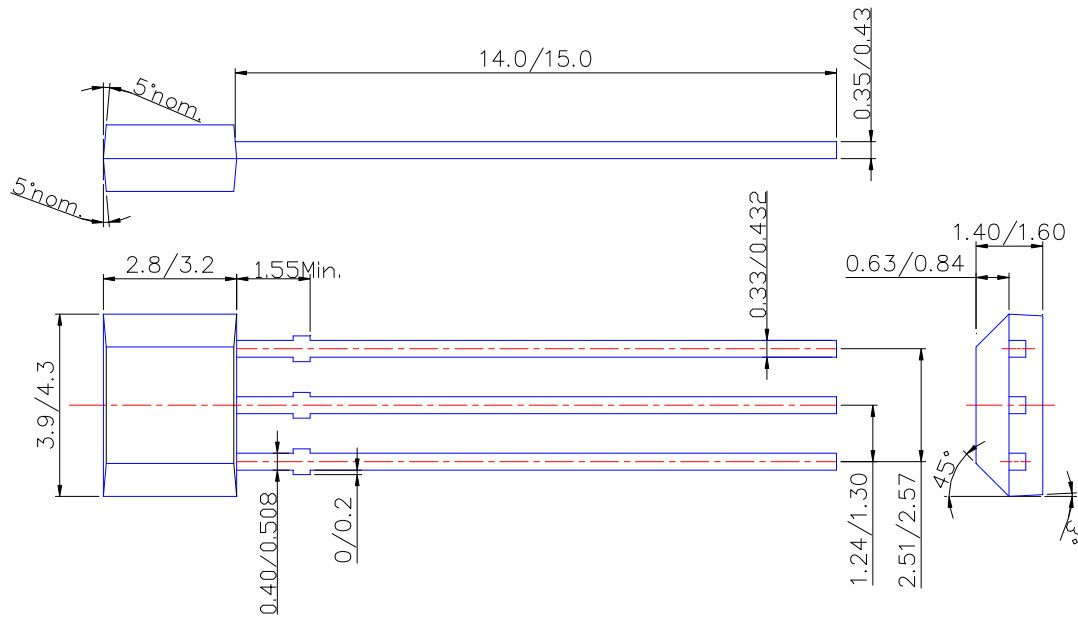


Active Area Depth



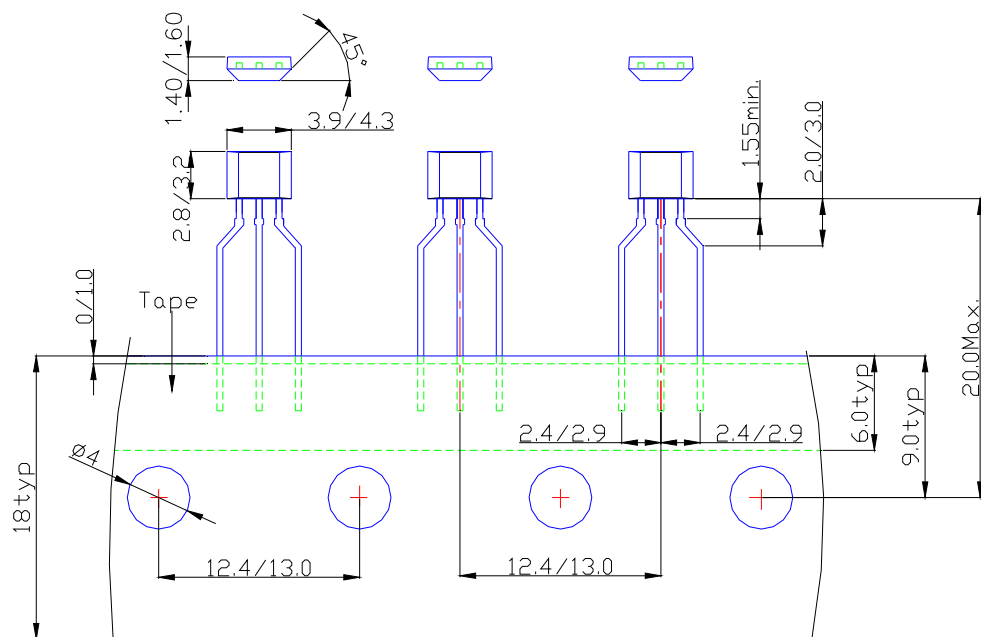
Sensor Location

Package Dimension

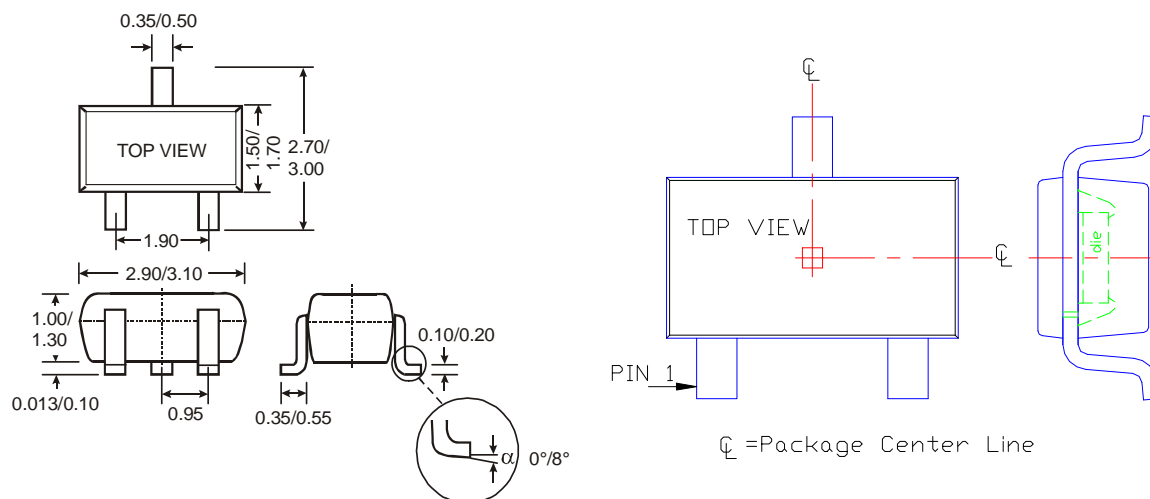


Package Information (Continued)

(2) Package Type: SIP-3L for Ammo pack



(3) SC59 (Commonly known as SOT23 in Asia)



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