

**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 Finish/RoHS Compliant for Lead Free products (Note 1)
- Lead Free Package: SIP-3L, SC59-3L
- Green Package: SC59-3L

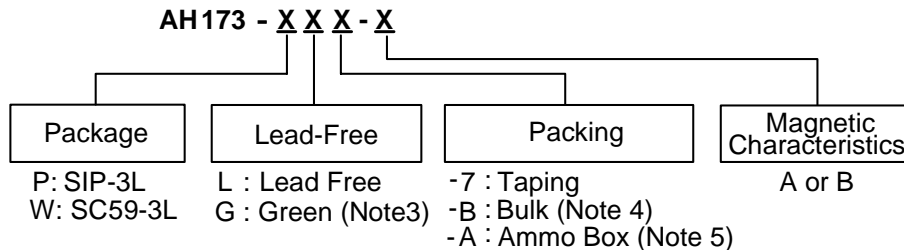
**General Description**

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**



Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

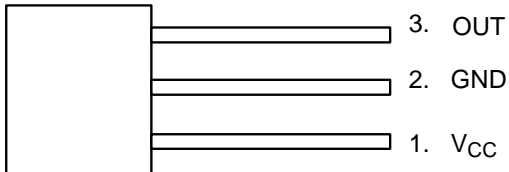
Device	Package Code	Packaging (Note 2)	Tube/Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH173-P	P	SIP3-3L	1000	-B	NA	NA	4000/Box	-A
AH173-W	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA

- Note: 2. 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>.
3. Green is only available for SC59-3L
4. Bulk is for SIP-3 Straight Lead.
5. Ammo Box is for SIP-3 Spread Lead.

**Pin Assignment**

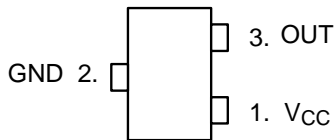
**Pin Description**

(Top View)



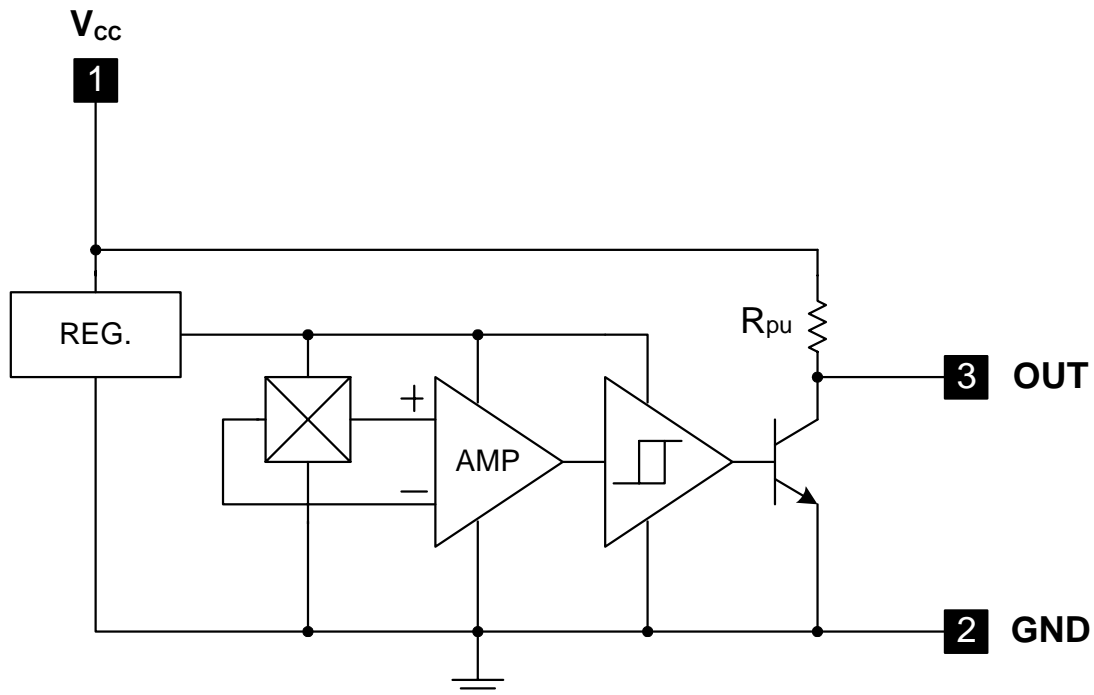
(SIP-3L package)

Name	Description
V <sub>CC</sub>	Positive Power Supply
GND	Ground
OUT	Output Stage

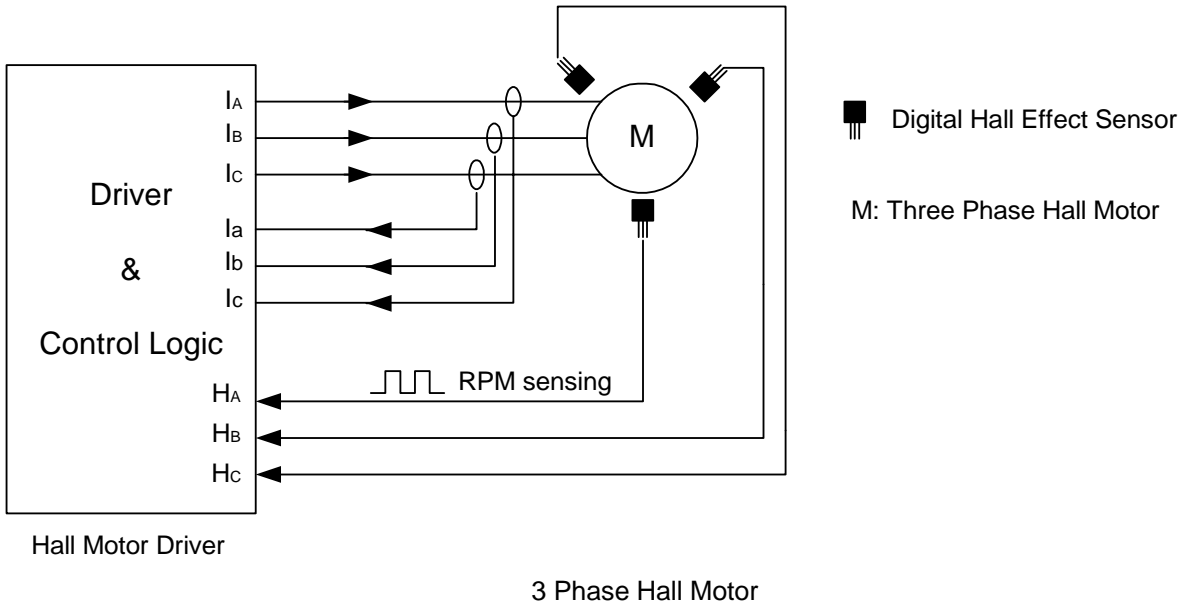


(SC59-3L Package)

**Block Diagram**



**Functional Application Circuit**



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

Characteristics	Symbol	Values	Unit
Supply Voltage	$V_{CC}$	20	V
Output "Off" Voltage	$V_{out (off)}$	20	V
Output "On" Current	$I_o (sink)$	25	mA
Operating Temperature Range	$T_{op}$	-40~+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65~+150	$^\circ\text{C}$
Maximum Junction Temperature	$T_j$	+150	$^\circ\text{C}$
Power Dissipation	SIP-3L	$P_D$	550
	SC59-3L		230

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$ )

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{CC}$		3	-	20	V
Output Saturation Voltage	$V_{out (sat)}$	$V_{CC} = 12\text{V}, \text{OUT "ON"}$ $I_o = 10\text{mA}$	-	300	400	mV
Supply Current	$I_{CC}$	$V_{CC} = 12\text{V}, \text{OUT "OFF"}$	-	3.5	6	mA
Internal Pull-up Resistor	$R_{pu}$		7	10	13	$\text{K}\Omega$
Dropout Voltage	$V_d$	$V_d = V_{CC} - V_{CE}$	-	-	0.3	V

**Functional Application Circuit**

(1mT = 10 Gauss)

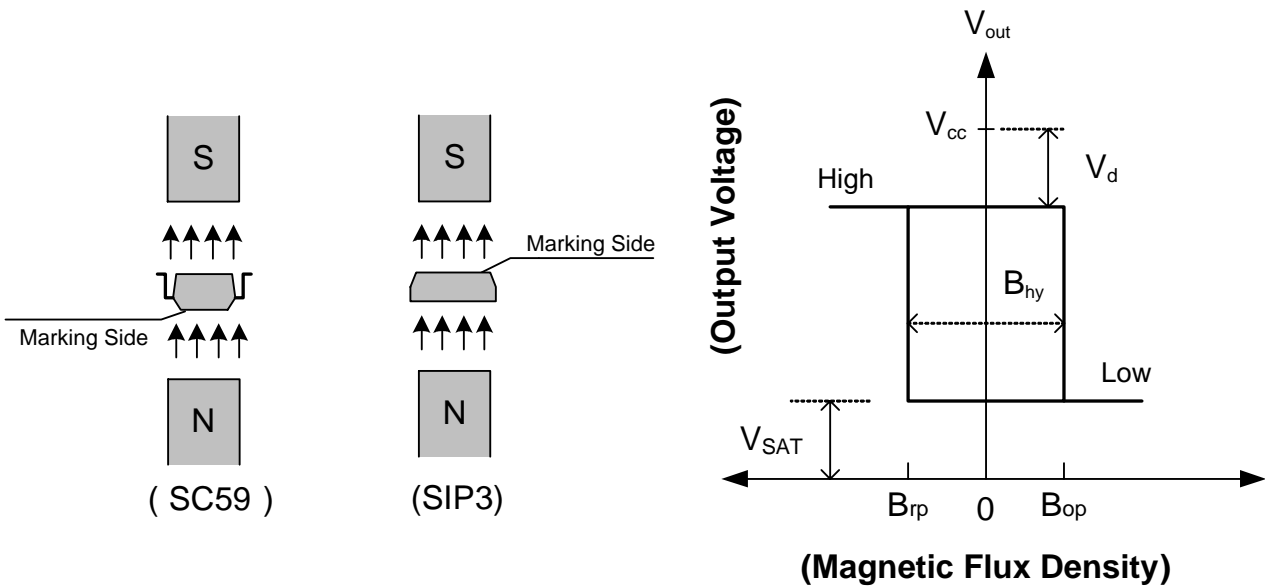
**A grade**

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operation Point	Bop	15	-	60	Gauss
Release Point	Brp	-60	-	-15	Gauss
Hysteresis	Bhy	-	80	-	Gauss

**B grade**

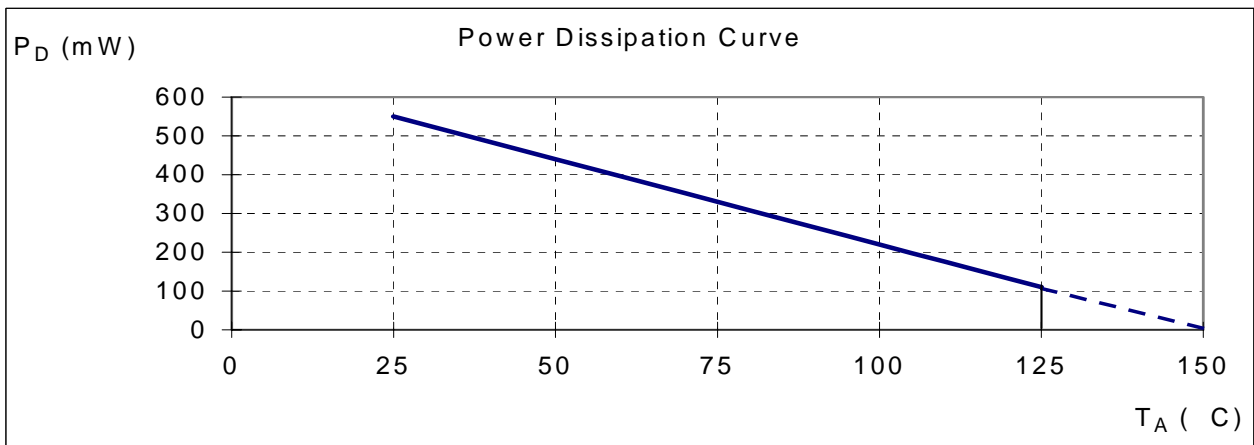
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operation Point	Bop	5	-	80	Gauss
Release Point	Brp	-80	-	-5	Gauss
Hysteresis	Bhy	-	80	-	Gauss

**Operating Characteristics**



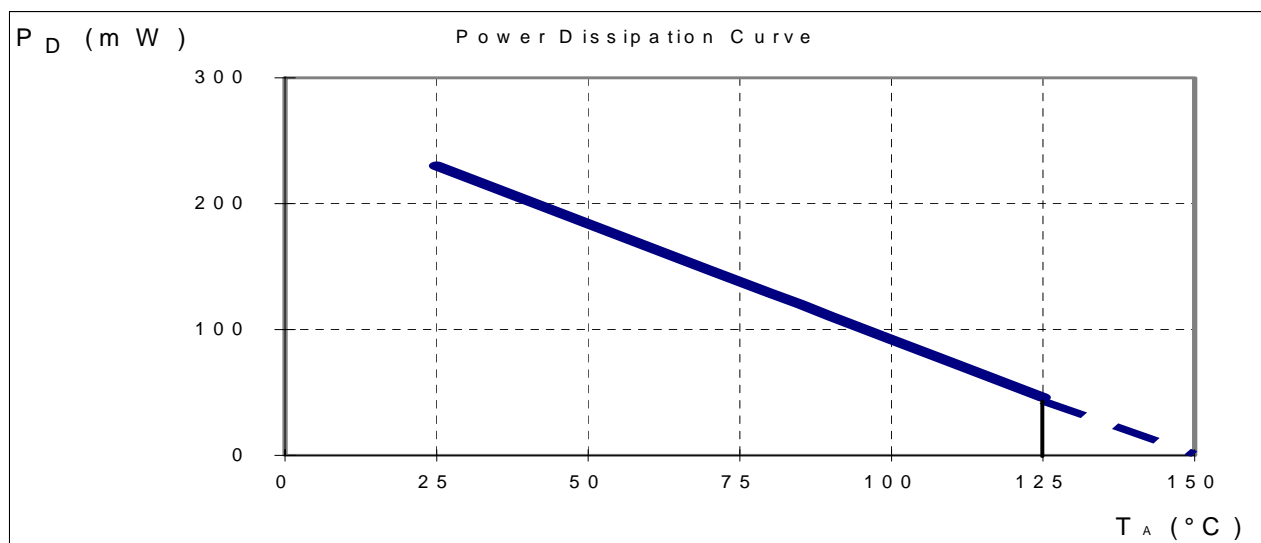
**Performance Characteristics (SIP-3L)**

$T_A$ (°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



**Performance Characteristics (SC59-3L)**

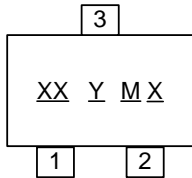
$T_A$ (°C)	25	50	60	70	80	85	90	100	110	120	125	130	140	150
$P_D$ (mW)	230	184	166	147	129	120	110	92	74	55	46	37	18	0



**Marking Information**

**(1) SC59-3L**

(Top View)

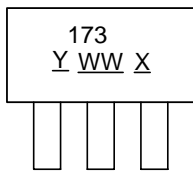


XX : J3: AH173  
Y : Year 0~9  
M : Month A~L  
X : Internal code a~z: Lead Free  
           A~Z: Green

Part Number	Package	Identification Code
AH173	SC59-3L	J3

**(2) SIP-3L**

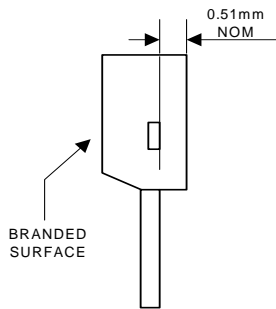
(Top View)



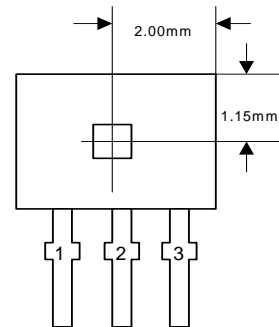
Y : Year: "1"=2001  
           "2"=2002  
WW: Nth Week 01~52  
X : Internal code  
       a~z: Lead Free

**Package Information**

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



Active Area Depth

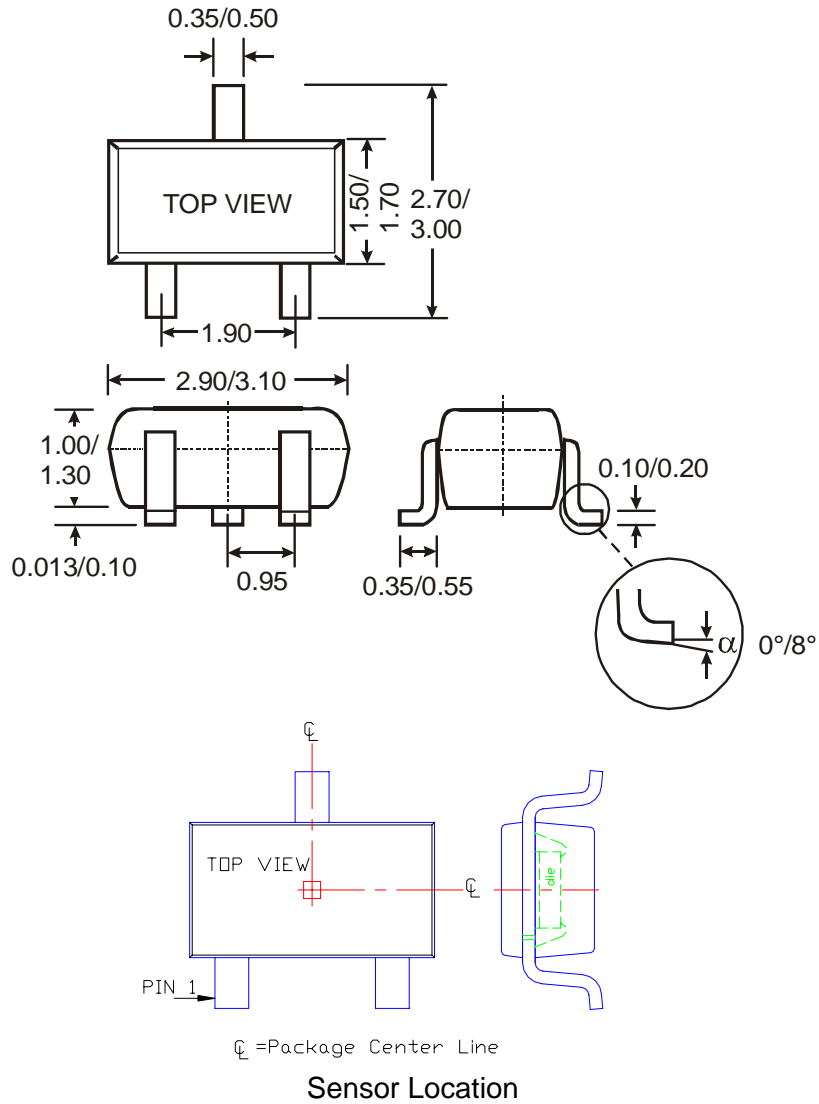


Sensor Location



**Package Information (Continued)**

(3) Package Type: SC59-3L





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