

## Description

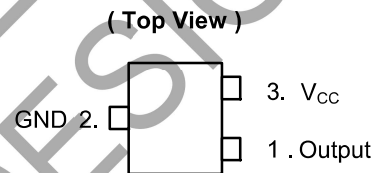
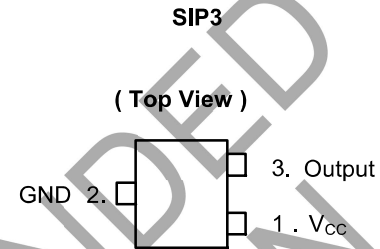
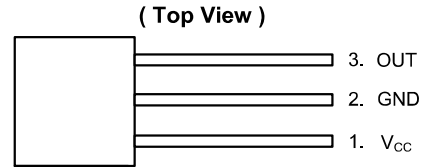
AH1751 is a single-digital-output Hall-effect sensor for high temperature operation. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier to amplify Hall voltage, and a comparator to provide switching hysteresis for noise rejection, and an open-collector output pre-driver. An internal 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 threshold  $B_{op}$ , the OUT pin turns on (low). If B removed toward  $B_{rp}$ , the OUT pin is latched "on" state prior to  $B < B_{rp}$ . When  $B < B_{rp}$ , the OUT pin go into "off" state.

## Features

- Bipolar Hall Effect Latch Sensor
- 3.5V to 20V DC Operation Voltage
- Open Collector Pre-Driver
- 50mA Output Sink Current
- Chip Power Reverse-Connection Protection
- Operating Temperature: -40°C to 125°C
- SIP3, SC59 and SC59R (Commonly known as SOT23 in Asia): Available in "Green" Molding Compound (No Br, Sb)
- **Totally Lead-free & Fully RoHS Compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Pin Assignments



## Applications

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

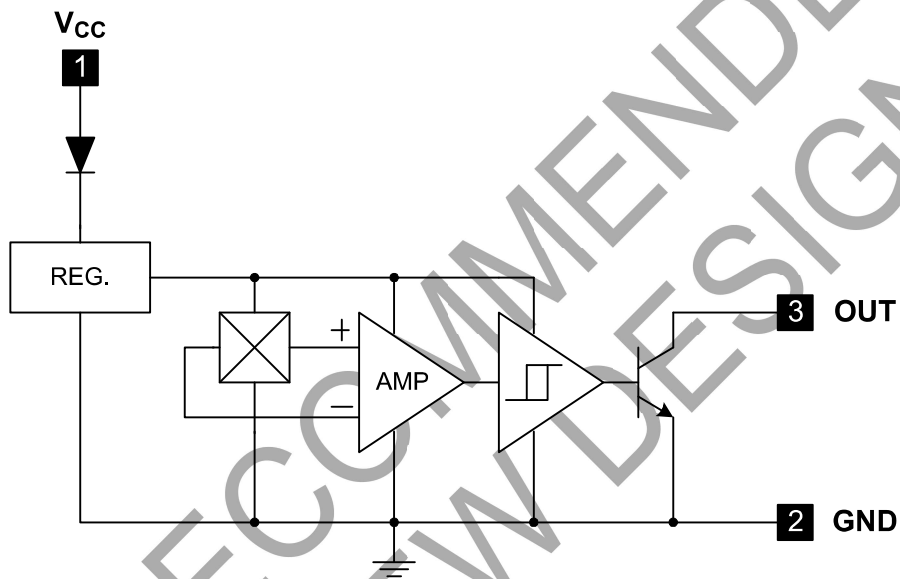
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

**Pin Descriptions**

Pin Name	Description
V <sub>CC</sub>	Input Power
GND	Ground
OUT	Output Stage

**Functional Block Diagram**



**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	Rating	Unit	
V <sub>CC</sub>	Supply Voltage	20	V	
V <sub>OUT (off)</sub>	Output "OFF" Voltage	20	V	
I <sub>O (sink)</sub>	Output "ON" Current	100	mA	
T <sub>ST</sub>	Storage Temperature Range	-65 to +150	°C	
T <sub>J(MAX)</sub>	Maximum Junction Temperature	+150	°C	
P <sub>D</sub>	Power Dissipation	SIP3	550	mW
		SC59 and SC59R	230	mW

### Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	Supply Voltage	Operating (Note 4)	3.5	20	V
$T_A$	Operating Temperature Range	Operating	-40	+125	°C

Note: 4. Operating, the output is switching as magnetic field change ( $S > 300G$ ,  $N < -300G$ ).

### Electrical Characteristics (@ $T_A = +25^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT(SAT)}$	Output Saturation Voltage	$V_{CC} = 12V$ , OUT "ON" $I_O = 50mA$	-	200	300	mV
$I_{CC}$	Supply Current	$V_{CC} = 12V$ , OUT "OFF"	-	3.5	6	mA

### Magnetic Characteristics (@ $T_A = +25^\circ C$ , $V_{CC} = 4V$ to $20V$ , unless otherwise specified. Note 5)

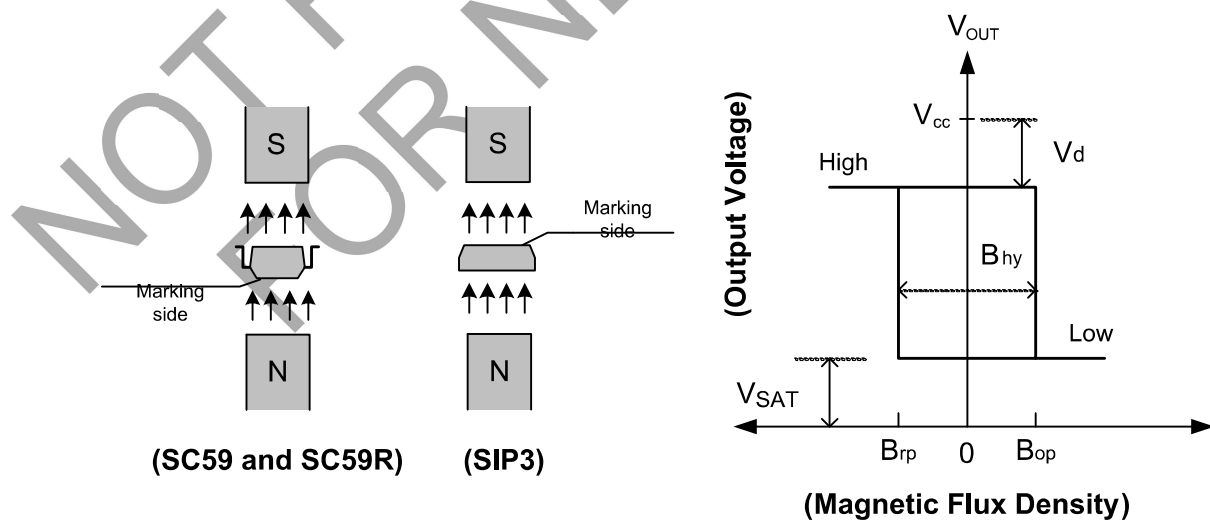
A grade

(1mT = 10 Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
Bops (south pole to brand side)	Operation Point	5	-	70	Gauss
Brps (south pole to brand side)	Release Point	-70	-	-5	Gauss
$B_{hy} ( B_{opx} - B_{rpx} )$	Hysteresis	-	75	-	Gauss

Notes: 5. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.

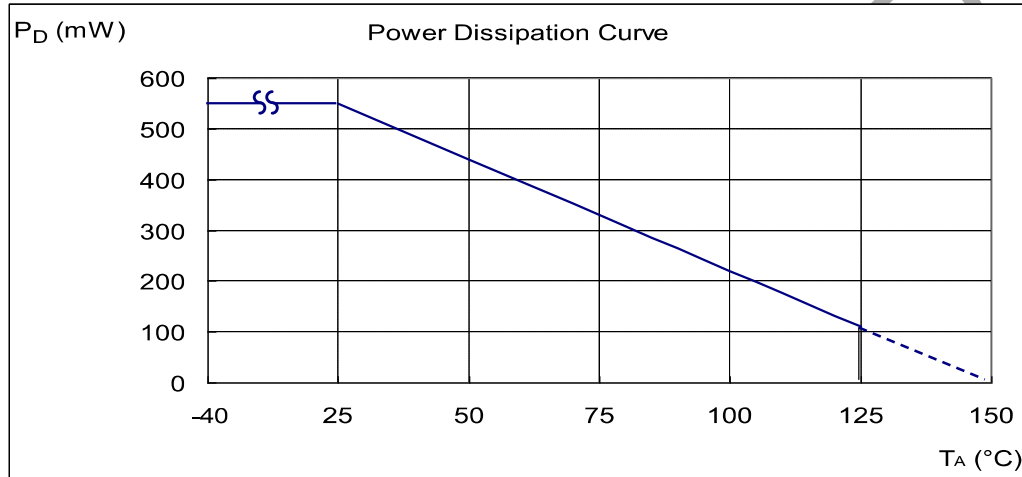
### Operating Characteristics



**Performance Characteristics**

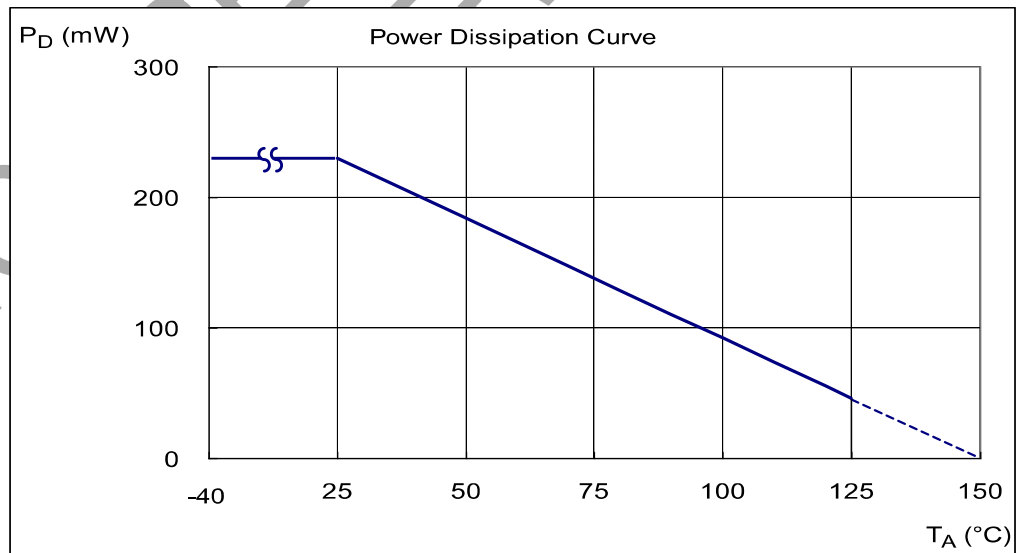
(1) SIP3

$T_A$ (°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

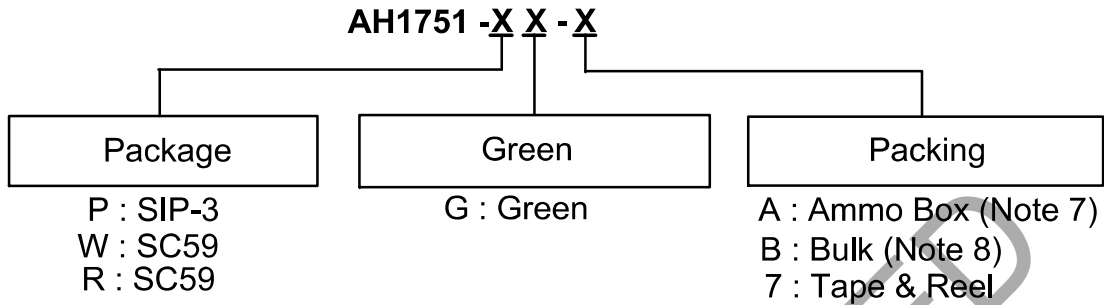


(2) SC59 and SC59R (Commonly known as SOT23 in Asia)

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



## Ordering Information

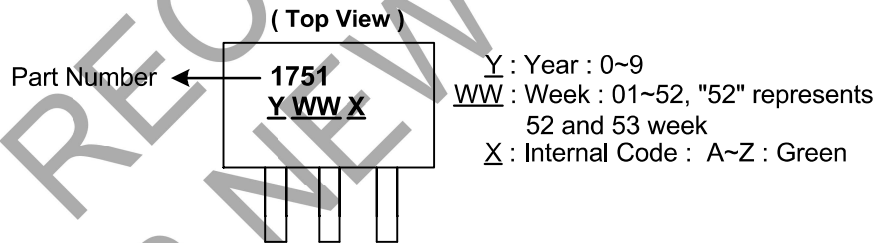


Part Number	Status (Note 9)	Package Code	Packaging (Note 6)	Bulk		7" Tape and Reel		Ammo Box	
				Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH1751-PG-A-A	NRND	P	SIP-3	NA	NA	NA	NA	4000/Box	A
AH1751-PG-B-A	NRND	P	SIP-3	1000	-B	NA	NA	NA	NA
AH1751-WG-7-A	NRND	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA
AH1751-RG-7-A	NRND	W	SC59R	NA	NA	3000/Tape & Reel	-7	NA	NA

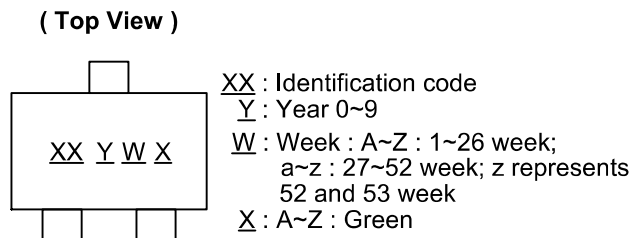
Notes: 6. Pad layout as shown on Diodes Inc. suggested pad layout document, which can be found on our website at <http://www.diodes.com/package-outlines.html>.  
 7. Ammo Box is for SIP3 Spread Lead.  
 8 . Bulk is for SIP-3 Straight Lead.  
 9: NRND = Not Recommended for New Design

## Marking Information

(1) Package Type: SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)



(2) Package Type: SC59 and SC59R (Commonly known as SOT23 in Asia)

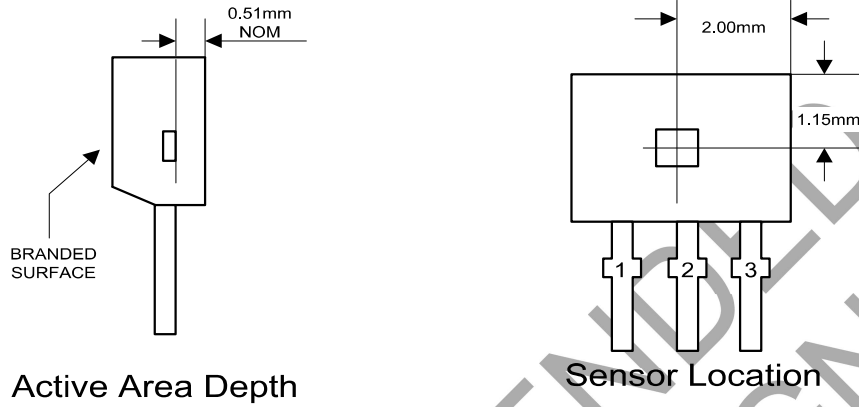


Part Number	Package	Identification Code
AH1751	SC59	RK
AH1751	SC59R	SK

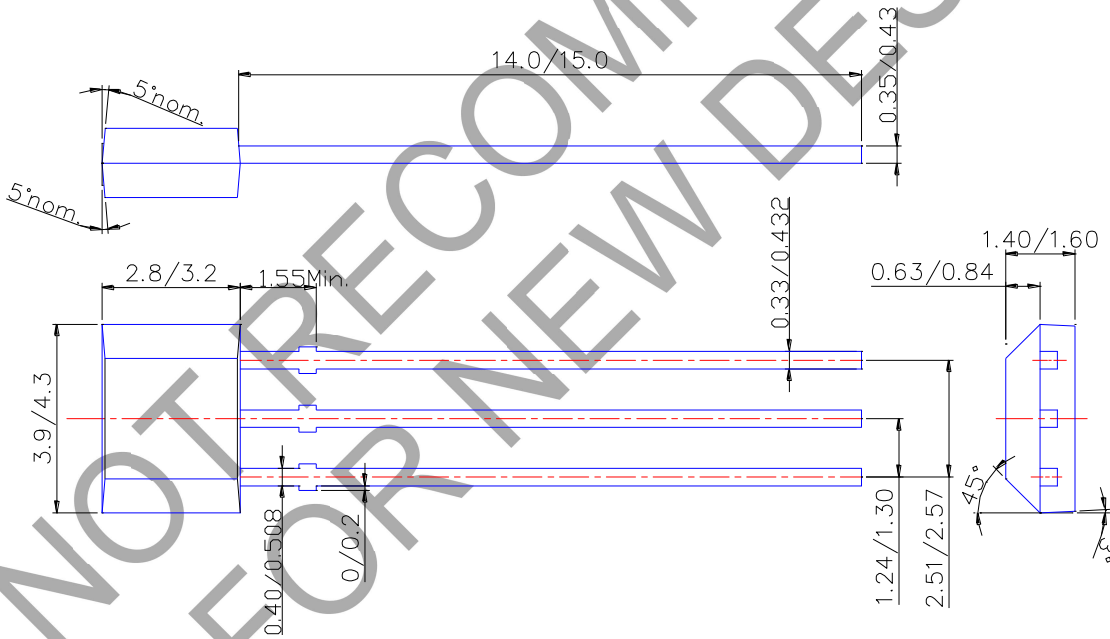
**Package Outline Dimensions and Suggested Pad Layout** (All dimensions in mm.)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SIP3 for Bulk pack



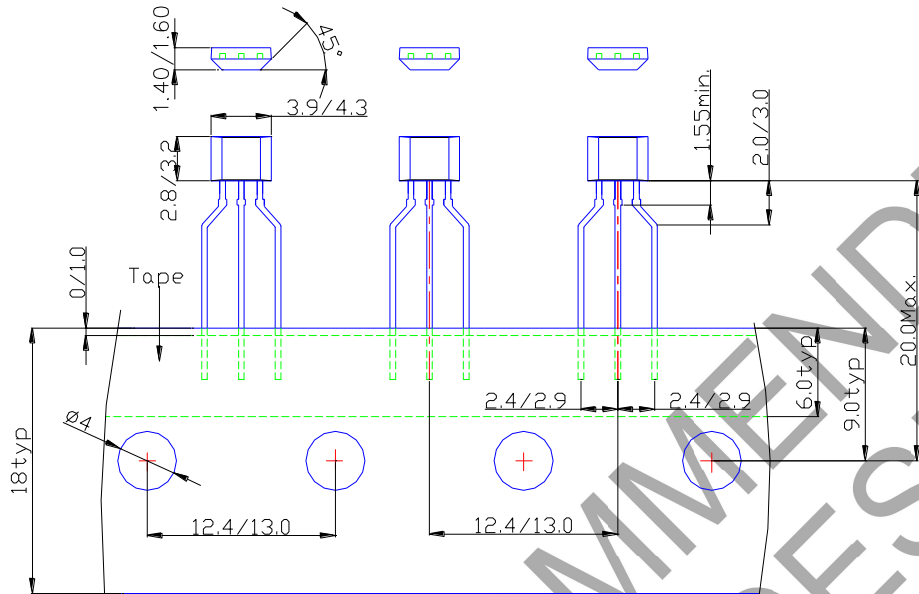
**Package Dimension**



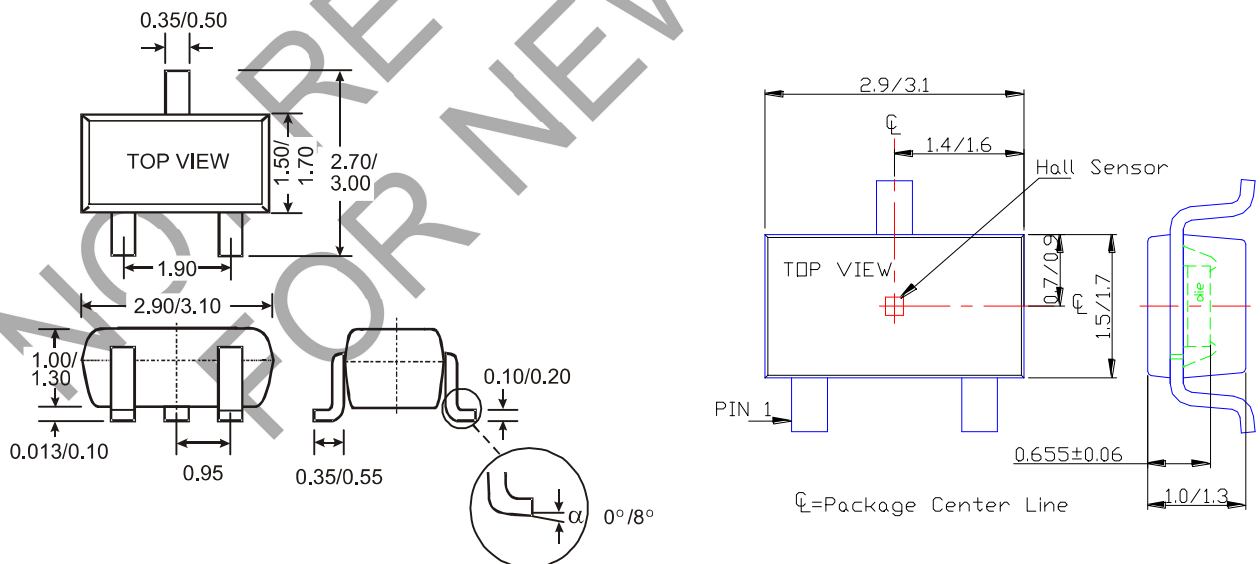
**Package Outline Dimensions and Suggested Pad Layout** (All dimensions in mm. Cont.)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**(2) Package Type: SIP3 for Ammo Pack**



**(3) Package Type: SC59 and SC59R (Commonly known as SOT23 in Asia)**



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