

## Description

DIODES™ AH337 is a unipolar Hall-Effect sensor for contactless switching applications. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection, and an open-collector output. The band-gap regulator allows a wide operating voltage range.

When the magnetic flux density (**B**) is larger than operate point (**Bop**), output is switched on (OUT pin is pulled low). The output state is held on until a magnetic flux density falls below Brp. When **B** is less than Brp, the output is switched off.

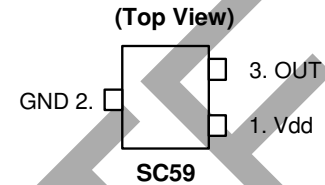
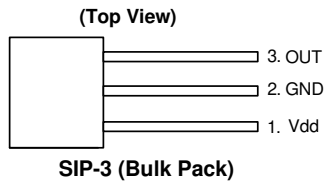
The AH337 is available in SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SC59 packages.

## Features

- Unipolar Hall-Effect Sensor
- 4.2V to 28V DC Operating Voltage
- Temperature Compensation
- Open Drain Pre-Driver
- 25mA Maximum Output Sink Current
- Operating Temperature: -40°C to +125°C
- SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SC59 Packages (SC59 is Commonly Known as SOT23 in Asia)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

- 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.

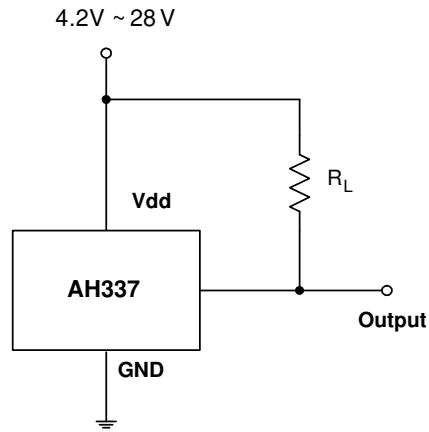
## Pin Assignments



## Applications

- VCD/DVD loaders, CD/DVD ROM
- Cover detectors
- Speed measurements
- Home appliances
- Home safeties

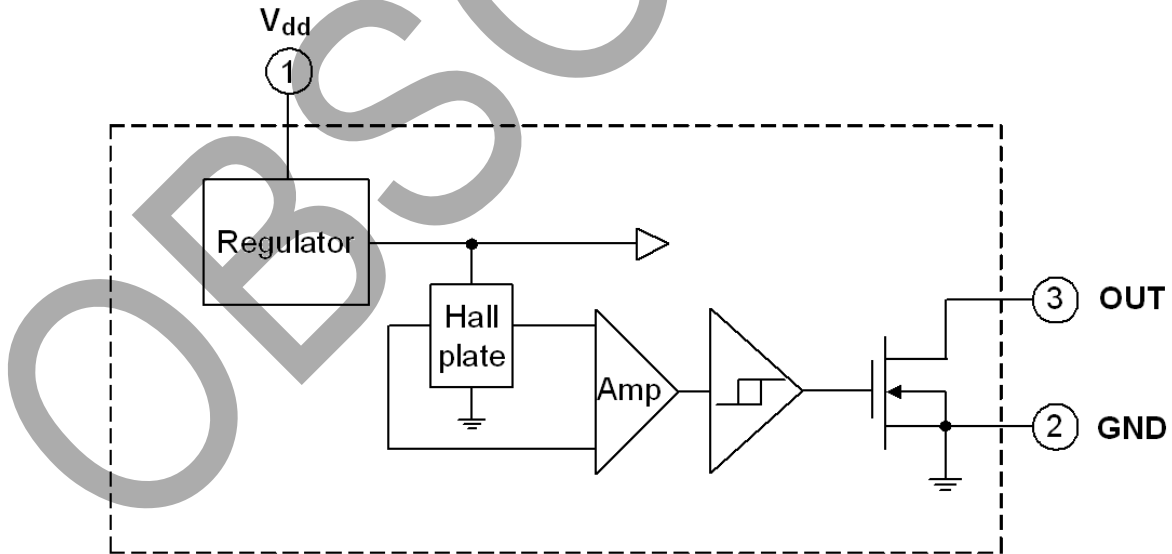
**Typical Applications Circuit**



**Pin Descriptions**

Pin Name	P/I/O	Pin Number	Description
Vdd	P	1	Positive Power Supply
GND	P	2	Ground
OUT	O	3	Output Pin

**Functional Block Diagram**



**Absolute Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Symbol	Characteristics	Values	Unit
$V_{dd}$	Supply Voltage	30	V
B	Magnetic Flux Density	Unlimited	—
$V_{DS}$	Output "OFF" Voltage	30	V
$I_d$	Output "ON" Current	Continuous	25
$T_S$	Storage Temperature Range	-65 to +150	$^\circ\text{C}$
$T_{J(\text{MAX})}$	Maximum Junction Temperature	+150	$^\circ\text{C}$
$P_D$	Package Power Dissipation	SIP-3 (Ammo Pack)	550
		SIP-3 (Bulk Pack)	550
		SC59	230

**Recommended Operating Conditions** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{dd}$	Supply Voltage (Note 4)	Operating	4.2	28	V
$T_A$	Operating Ambient Temperature	Operating	-40	+125	$^\circ\text{C}$

Note: 4. The output of IC will be switched after the supply voltage is over 4.2V, but the magnetic characteristics won't be normal until the supply is over 4.5V.

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ ,  $V_{dd} = 12\text{V}$ , unless otherwise specified.)

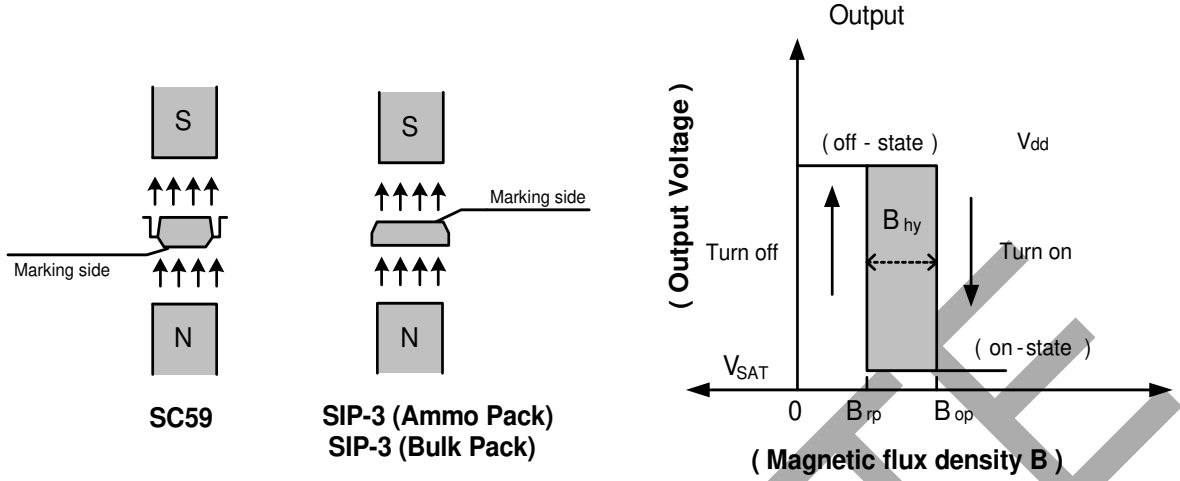
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_{DS(\text{SAT})}$	Output Saturation Voltage	$I_{OUT} = 10\text{mA}$ , $B > B_{op}$	—	300	400	mV
$I_{off}$	Output Leakage Current	$B < B_{rp}$	—	< 0.1	10	$\mu\text{A}$
$I_{dd}$	Supply Current	Output Open	—	2	4	mA

**Magnetic Characteristics** ( $T_A = +25^\circ\text{C}$ ,  $V_{dd} = 4.5\text{V to } 28\text{V}$ ) (Note 5)

Symbol	Parameter	Min	Typ	Max	Unit
Bops (South Pole to Brand Side)	Operation Point	90	120	150	Gauss
Brps (South Pole to Brand Side)	Release Point	30	60	90	Gauss
$B_{hy} ( B_{opx}  -  B_{rpx} )$	Hysteresis	—	60	—	Gauss

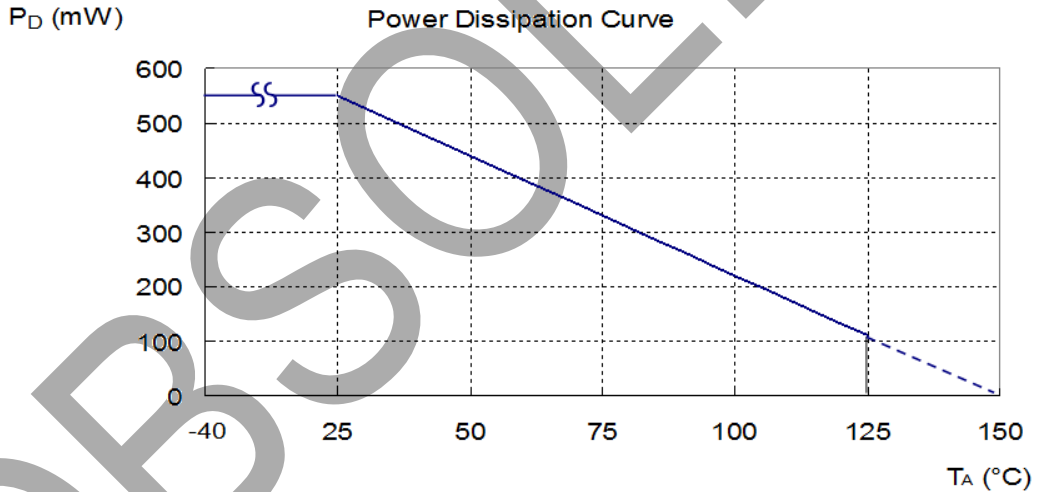
Note: 5. Magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

**Performance Characteristics**



(1) SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)

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

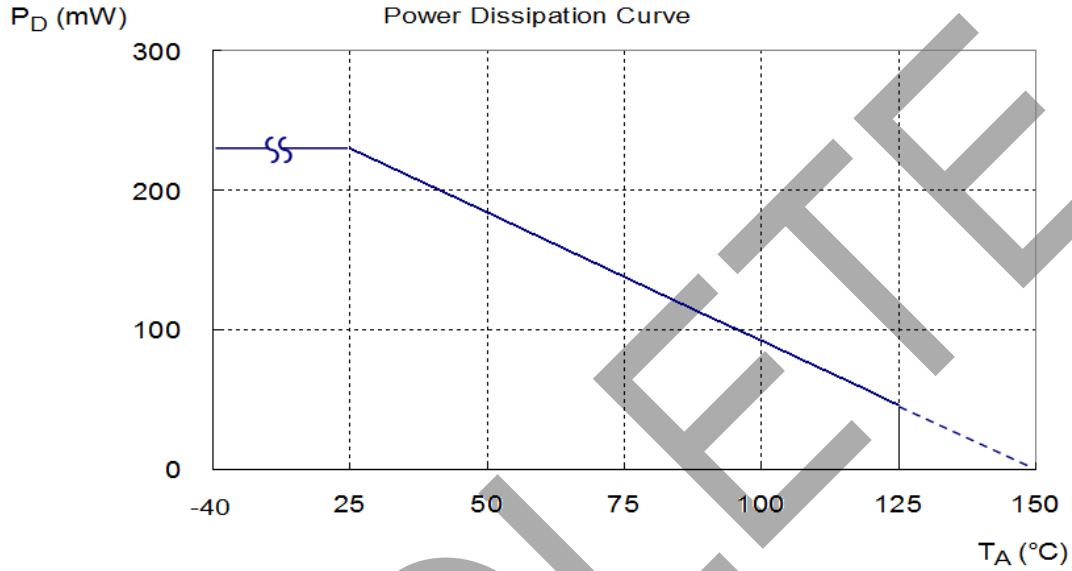


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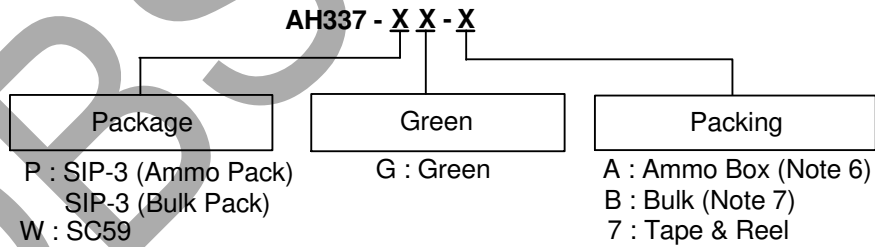
**Performance Characteristics** (continued)

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

T <sub>A</sub> (°C)	+25	+50	+60	+70	+80	+85	+90	+100	+110	+120	+130	+140	+150
P <sub>D</sub> (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



**Ordering Information**



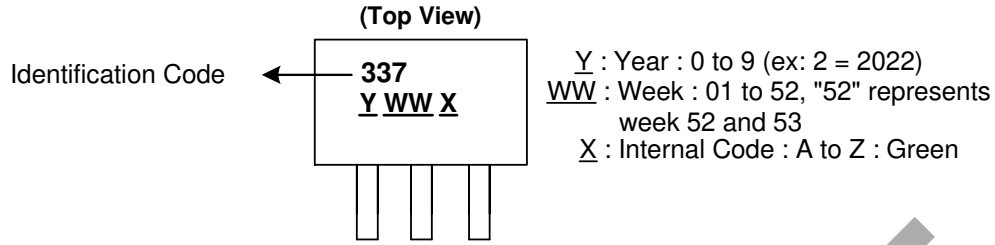
Part Number	Part Number Suffix	Package Code	Package (Note 8)	Packing	
				Qty.	Carrier
AH337-PG-A	-A	P	SIP-3 (Ammo Pack)	4000	Box
AH337-PG-B	-B	P	SIP-3 (Bulk Pack)	1000	Bulk
AH337-WG-7	-7	W	SC59	3000	7" Tape & Reel

Notes: 6. Ammo Box is for SIP-3 spread lead.  
 7. Bulk is for SIP-3 straight lead.  
 8. Pad layout as shown on Diodes Incorporated's suggested pad layout, which can be found on website at <http://www.diodes.com/package-outlines.html>.

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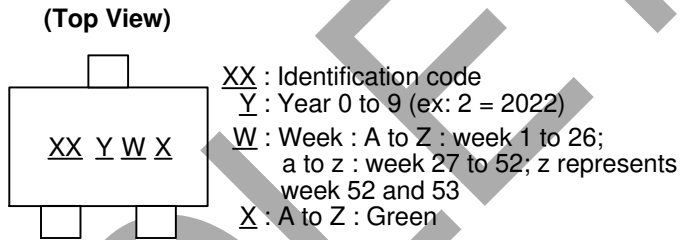
**Marking Information**

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



Part Number	Package	Identification Code
AH337-PG-A	SIP-3 (Ammo Pack)	337
AH337-PG-B	SIP-3 (Bulk Pack)	337

(2) Package Type: SC59

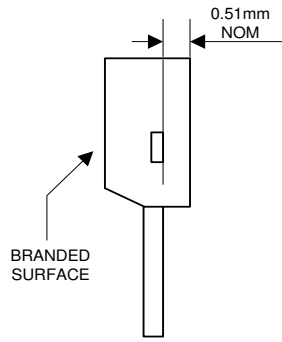


Part Number	Package	Identification Code
AH337-WG-7	SC59	P1

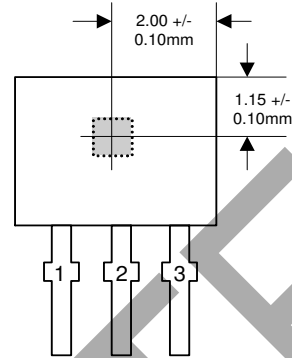
**Package Outline Dimensions**

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

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

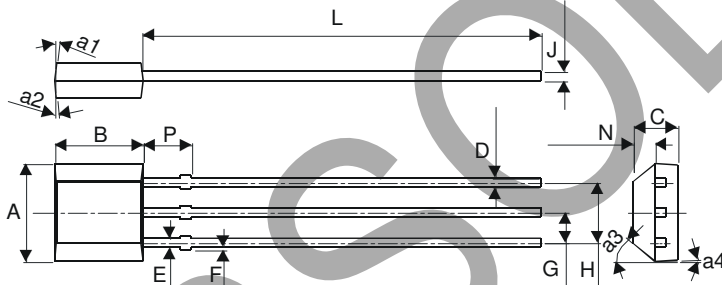


Active Area Depth



Sensor Location

**Package Dimensions**



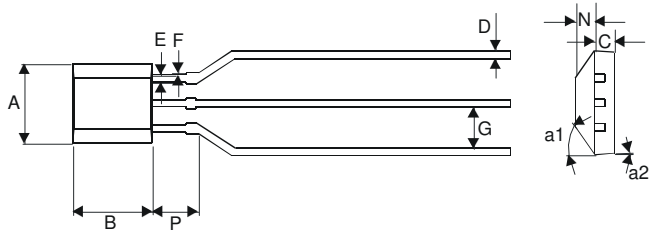
SIP-3 (Bulk Pack)		
Dim	Min	Max
A	3.9	4.3
a1	5° Typ	
a2	5° Typ	
a3	45° Typ	
a4	3° Typ	
B	2.8	3.2
C	1.40	1.60
D	0.33	0.432
E	0.40	0.508
F	0	0.2
G	1.24	1.30
H	2.51	2.57
J	0.35	0.43
L	14.0	15.0
N	0.63	0.84
P	1.55	-
<b>All Dimensions in mm</b>		

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**Package Outline Dimensions** (continued)

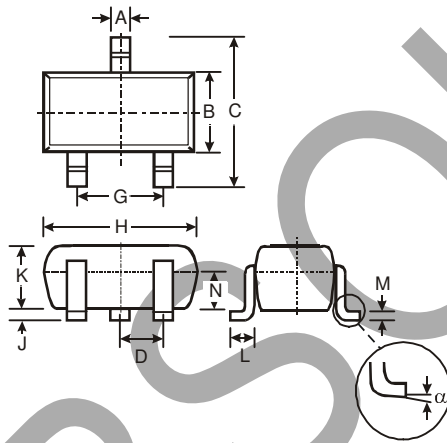
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(2) Package Type: SIP-3 (Ammo Pack)

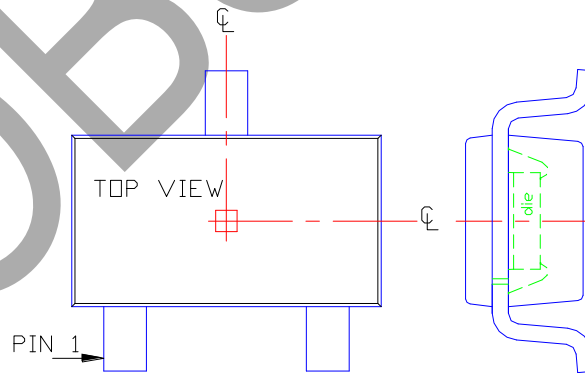


SIP-3 (Ammo Pack)		
Dim	Min	Max
A	3.9	4.3
a1	45° Typ	
a2	3° Typ	
B	2.8	3.2
C	1.40	1.60
D	0.35	0.41
E	0.43	0.48
F	0	0.2
G	2.4	2.9
N	0.63	0.84
P	1.55	-
All Dimensions in mm		

(3) Package Type: SC59 (Commonly Known as SOT23 in Asia)



SC59			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
G	-	-	1.90
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	-
All Dimensions in mm			



CL = Package Center Line

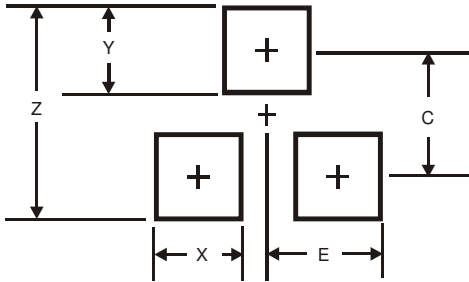
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**Suggested Pad Layout**

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

(1) Package Type: SC59 (Commonly Known as SOT23 in Asia)



Dimensions	Value (in mm)
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

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