AH375

SINGLE PHASE HALL EFFECT LATCH

Features

- 2.2V to 20V DC Operation Voltage
- Temperature Compensation
- Wide Operating Voltage Range
- Open Drain Pre-Driver
- 25mA Maximum Sinking Output Current
- Lead Free Package: SIP3 (Note 1) and SC59 (Commonly known as SOT23 in Asia)
- SC59: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/RoHS Compliant (Note 2)

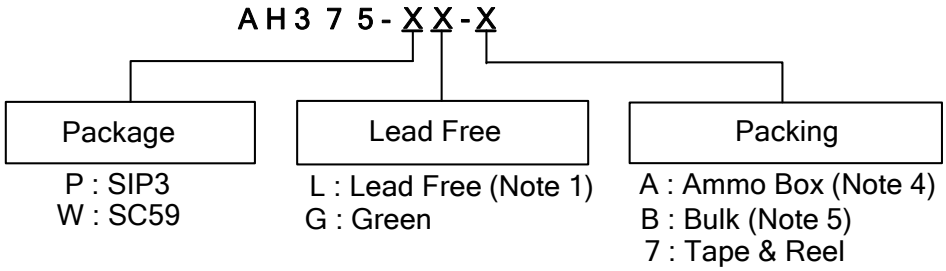
General Description

AH375 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open drain output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.
If a magnetic flux density larger than threshold Bop, DO is turned on (low). The output state is held until a magnetic flux density reversal falls below Brp causing DO to be turned off (high).

Applications

- Brush-Less DC Motor
- Brush-Less DC Fan
- Revolution Counting
- Speed Measurement

Ordering Information

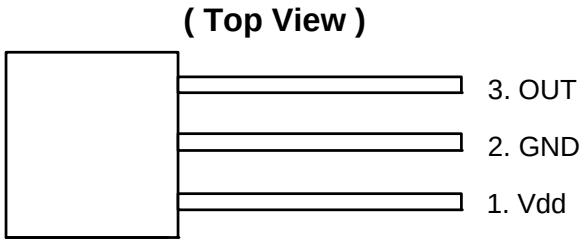


Device	Package Code	Packaging (Note 3)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH375-PL-A	P	SIP3	NA	NA	NA	NA	4000/Box	-A
AH375-PL-B	P	SIP3	1000	-B	NA	NA	NA	NA
AH375-WL-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA
AH375-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

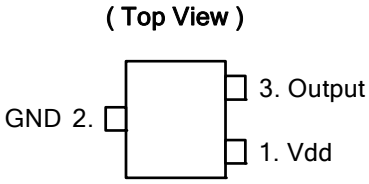
Notes:
1. SIP3 is available in "Lead Free" product only.
2. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.
3. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
4. Ammo Box is for SIP3 Spread Lead.
5. Bulk is for SIP3 Straight Lead.

Pin Assignment

(1) SIP3



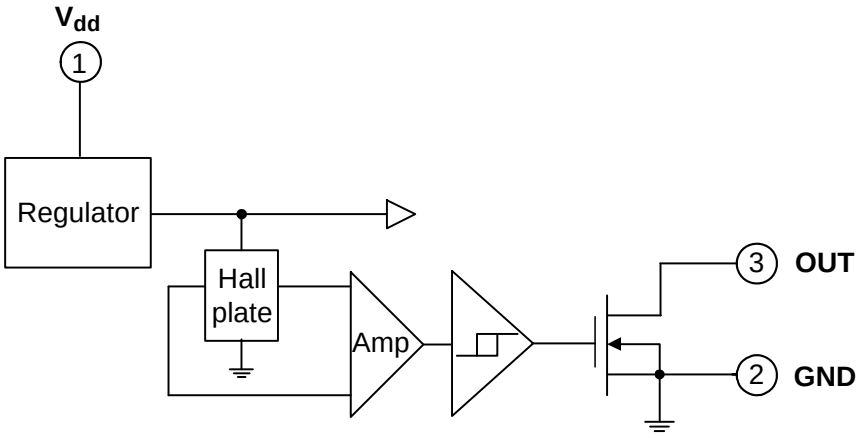
(2) SC59



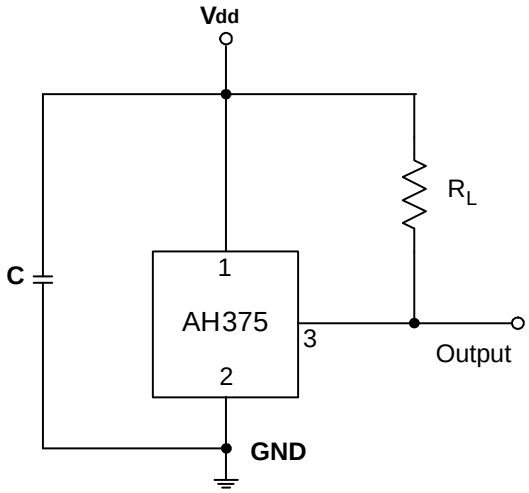
Pin Descriptions

Name	P/I/O	Pin #	Description
V_{dd}	P	1	Positive Power Supply
GND	P	2	Ground
OUT	O	3	Output Pin

Block Diagram



Typical Application Circuit



Absolute Maximum Ratings (T_A = 25°C)

Symbol	Characteristics		Values	Unit
Vdd	Supply Voltage		20	V
B	Magnetic Flux Density		Unlimited	
V_{DS}	Output OFF Voltage		30	V
Id	Output "On" Current	Continuous	25	mA
T_{ST}	Storage Temperature Range		-65~+150	°C
$T_{J(MAX)}$	Maximum Junction Temperature		150	°C
P_D	Package Power Dissipation	SIP3	550	mW
		SC59	230	
θ_{JC}	Thermal Resistance	SIP3	227	°C/W
		SC59	543	

Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
Vdd	Supply Voltage (Note 6)	Operating	2.2	20	V
T_A	Operating Ambient Temperature	Operating	-40	125	°C

Notes: 6. The output of IC will be switched after the supply voltage is over 2.2V, but the magnetic characteristics won't be normal until the supply is over 2.5V.

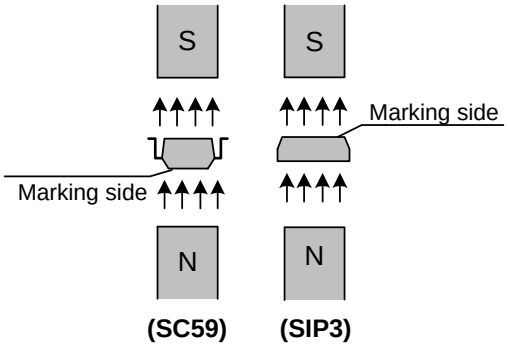
Electrical Characteristics (T_A = + 25°C, V_{dd} = 12V)

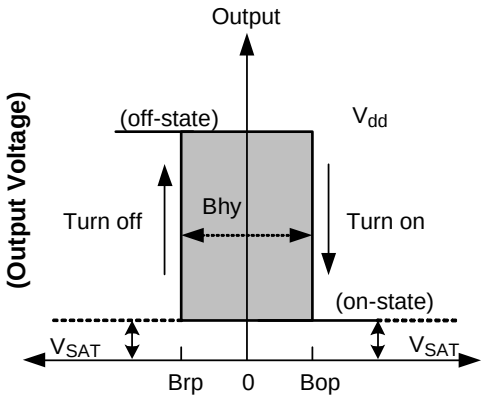
Symbol	Characteristic	Test Conditions	Min	Typ.	Max	Unit
$V_{ds(SAT)}$	Output Saturation Voltage	I_{out} = 20mA	-	300	700	mV
I_{off}	Output Leakage Current	V_{DD} = 14V	-	<0.1	10	uA
I_{dd}	Supply Current	Output Open	-	2	4	mA

Magnetic Characteristics (T_A = 25°C, V_{dd} = 2.5V to 20V)

(1mT = 10 Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operation Point	5	30	60	Gauss
Brps(south pole to brand side)	Release Point	-60	-30	-5	Gauss
Bhy(|Bopx – Brpx|)	Hysteresis	-	60	-	Gauss



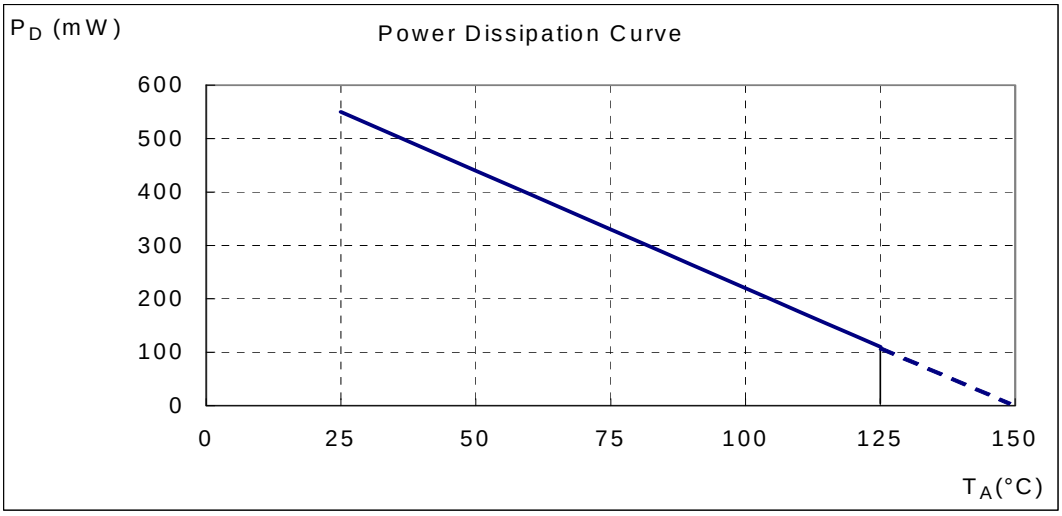


(Magnetic Flux Density B)

Performance Characteristics

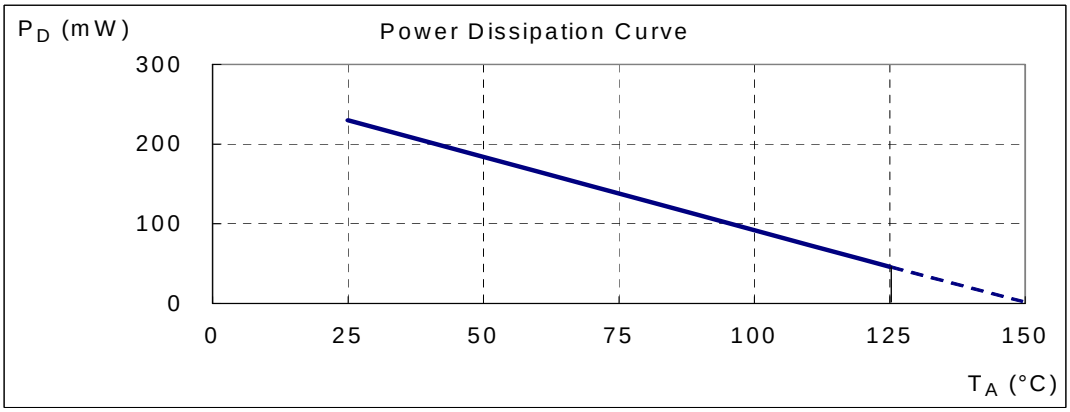
(1) SIP3

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 (Commonly known as SOT23 in Asia)

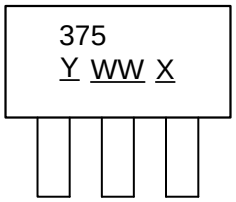
T_A (°C)	25	50	60	70	80	90	100	110	120	125	130	140	150
P_D (mW)	230	184	166	147	129	110	92	74	55	46	37	18	0



Marking Information

(1) SIP3

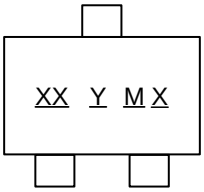
(Top View)



Y : Year : "07"= 2007
"08"= 2008
WW : Nth Week 01~52
X : Internal code
a~z : Lead Free

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

(Top View)

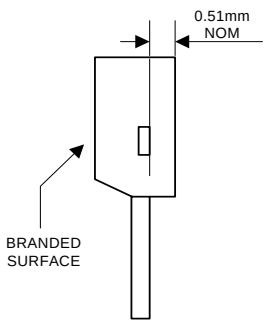


XX : P3 : AH375
Y : Year 0~9
M : Month A~L
X : Internal code
a~z : Lead Free
A~Z : Green

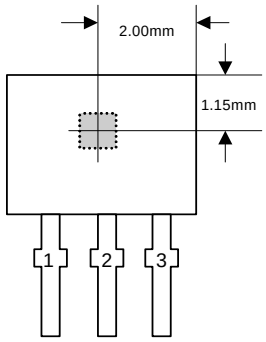
Part Number	Package	Identification Code
AH375	SC59	P3

Package Information (All Dimensions in mm)

(1) Package Type: SIP3 for Bulk only

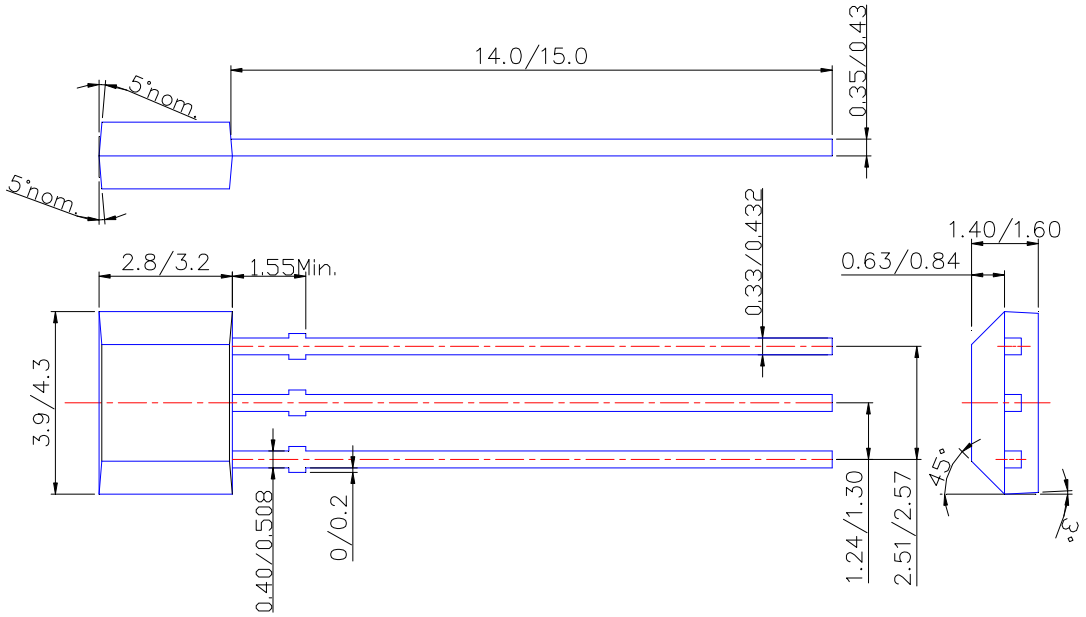


Active Area Depth



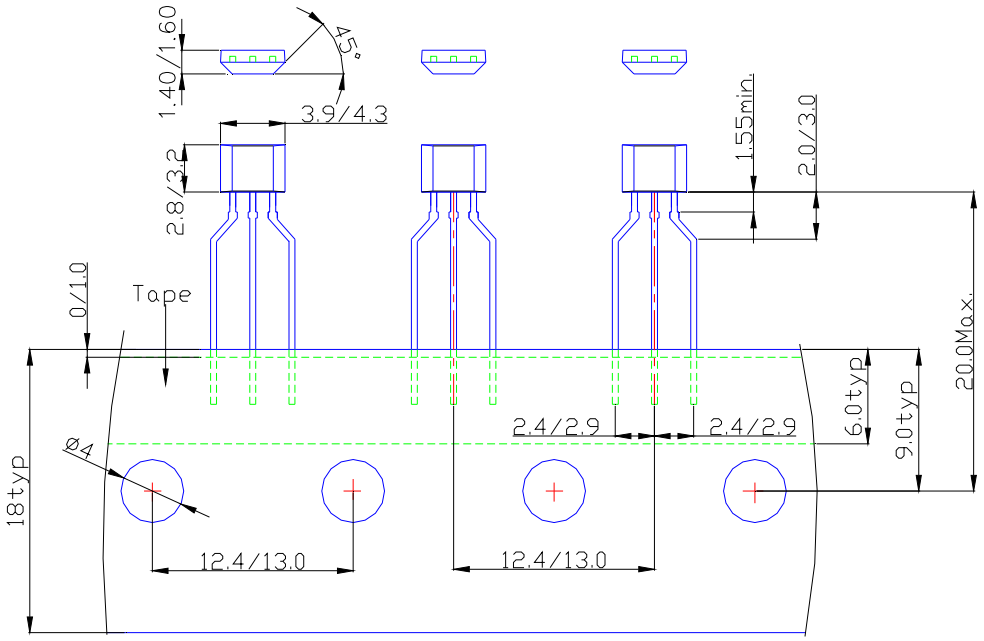
Sensor Location

Package Dimension

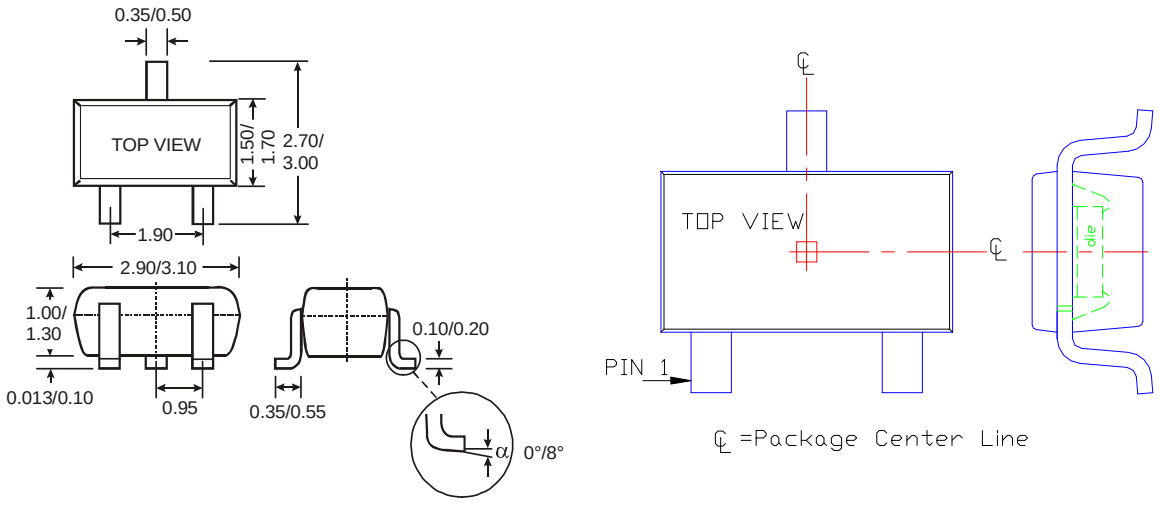


Package Information (Continued)

(2) Package Type: SIP3 for Ammo Pack-only



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



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