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
- Package: SIP3, SOT23

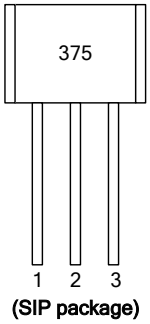
■ Applications

- Brush-less DC Motor
- Brush-less DC Fan
- Revolution counting
- Speed measurement

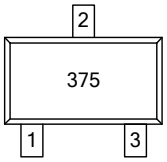
■ General Description

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 bandgap 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).

■ Pin Assignments



(SIP package)



(SOT23 package)

(Top view)

1 : Vdd

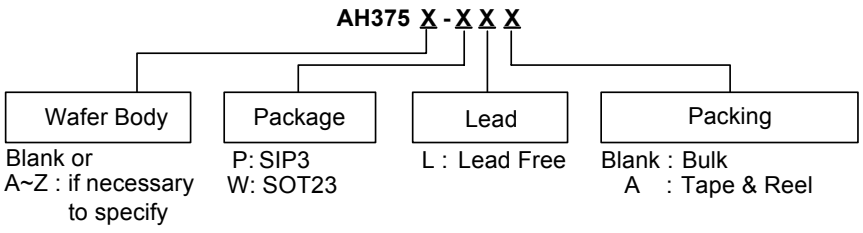
2 : GND

3 : OUT

■ Pin Descriptions

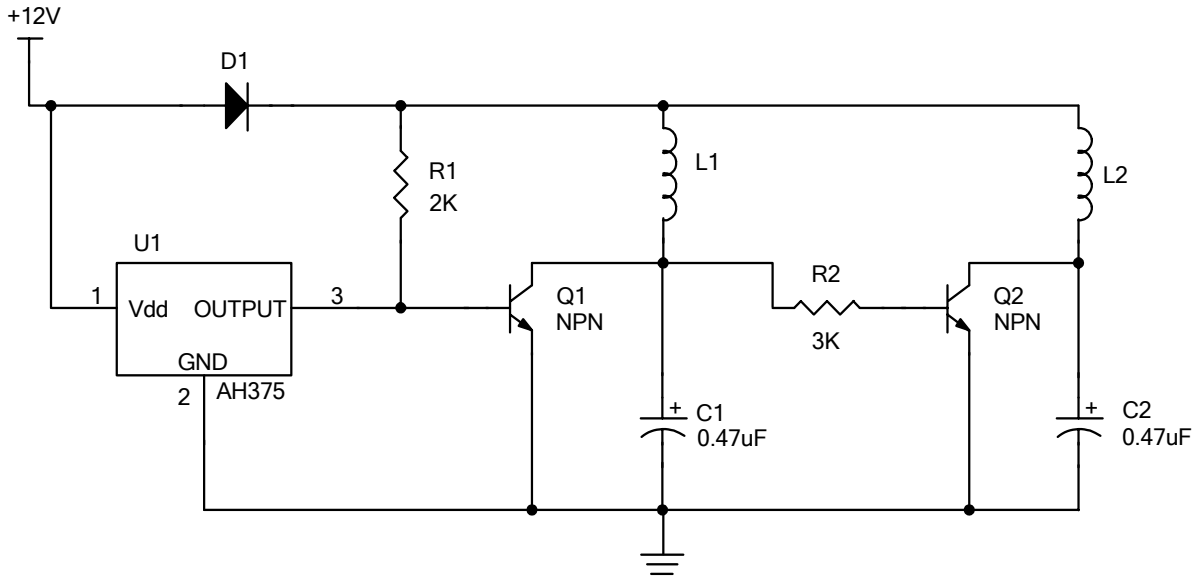
Name	P/I/O	Pin #	Description
Vdd	P	1	Positive Power Supply
GND	P	2	Ground
OUT	O	3	Output Pin

■ Ordering Information



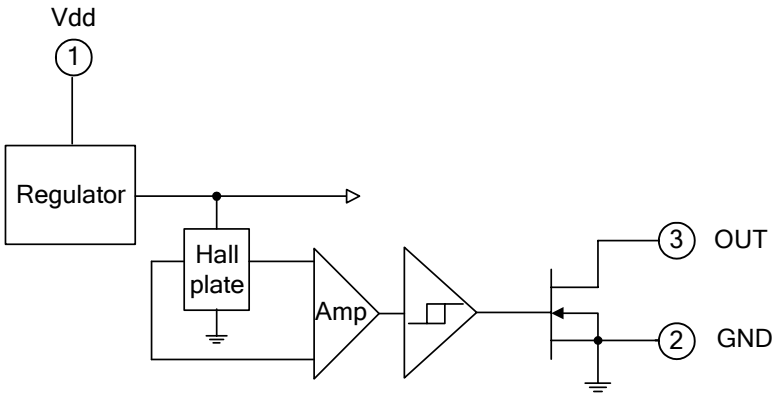
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■ Typical Application Circuit



Brush-less DC Fan

■ Functional Block Diagrams



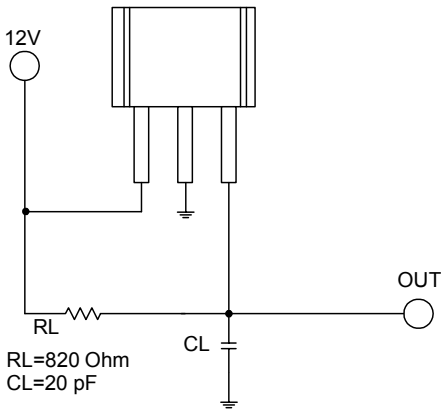
■ Absolute Maximum Ratings (at Ta=25°C)

Characteristics		Symbol	Values	Unit
Supply Voltage		Vdd	20	V
Magnetic Flux Density		B	Unlimited	
Output OFF Voltage		V_{DS}	30	V
Output "On" Current	Continuous	Id	25	mA
Operating Temperature Range		Ta	-40~+125	°C
Storage Temperature Range		Ts	-65~+150	°C
Maximum Junction Temp.		Tj	150	°C
Package Power Dissipation	SIP-3L	Pd	550	mW
	SOT23-3L		230	mW
Thermal Resistance	SIP-3L	θjc	227	°C/W
	SOT23-3L		543	

■ Electrical Characteristics (Ta=+ 25°C, Vdd =12V)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Vdd	—	2.2	-	20	V
Output Saturation Voltage	Vds(sat)	Iout=20mA	-	300	700	mV
Output Leakage Current	Ioff	V_{DD} =14V	-	<0.1	10	uA
Supply Current	Idd	Output Open	-	2	4	mA
Output Rise Time	tr	RL=820Ω, CL=20Pf	-	0.1	1	us
Output Falling Time	tf	RL=820Ω, CL=20pF	-	0.1	1	us

■ Test Circuit

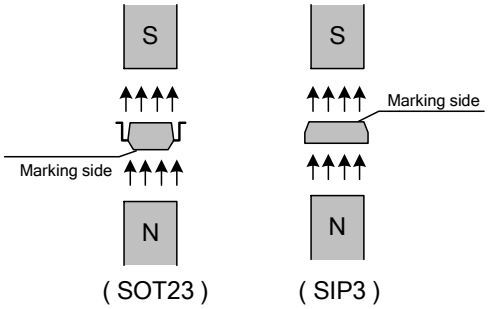


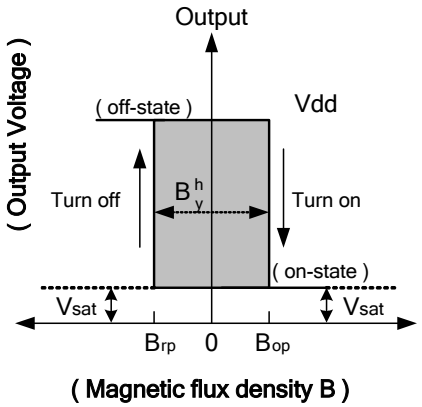
Test Circuit

■ Magnetic Characteristics (Ta=25°C, Vdd =2.5V to 20V)

(1mT=10Gauss)

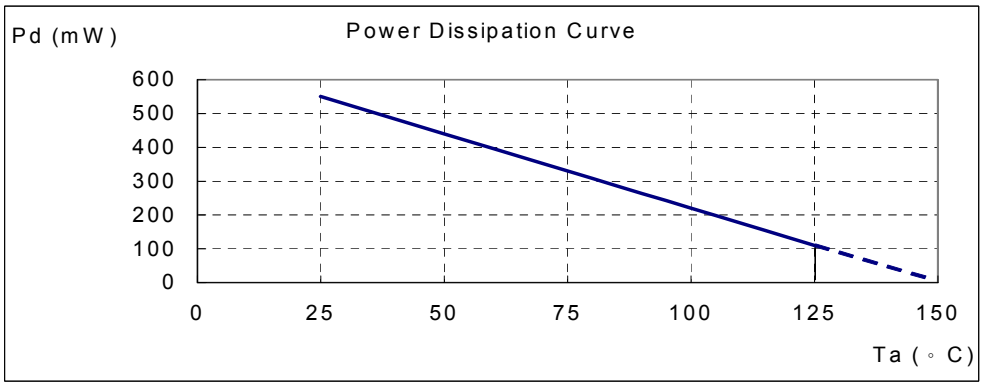
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	5	30	60	Gauss
Release Point	Brp	-60	-30	-5	Gauss
Hysteresis	Bhys	-	60	-	Gauss





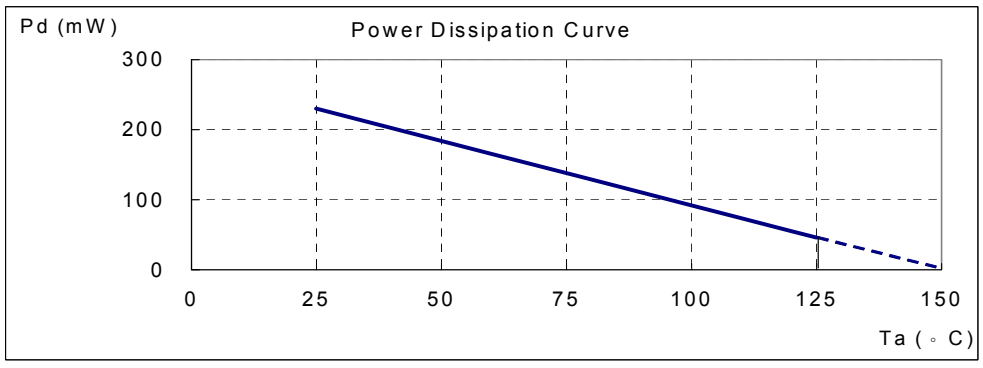
■ Performance Characteristics (SIP3)

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



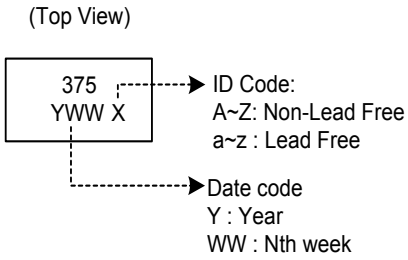
■ Performance Characteristics (SOT23-3)

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

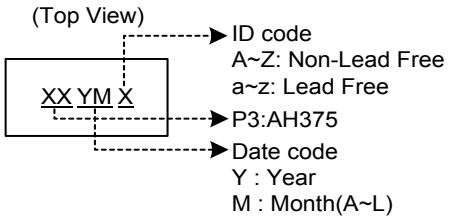


■ Marking Information

(1) SIP3

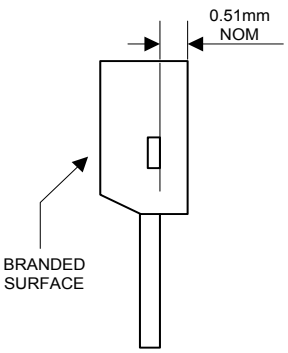


(2) SOT23

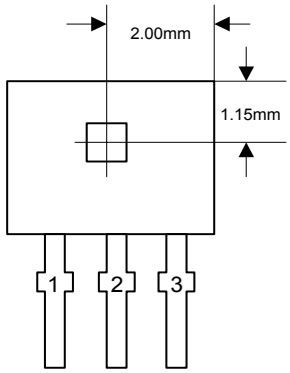


■ Package Information (unit: mm)

(1) Package Type: SIP-3L

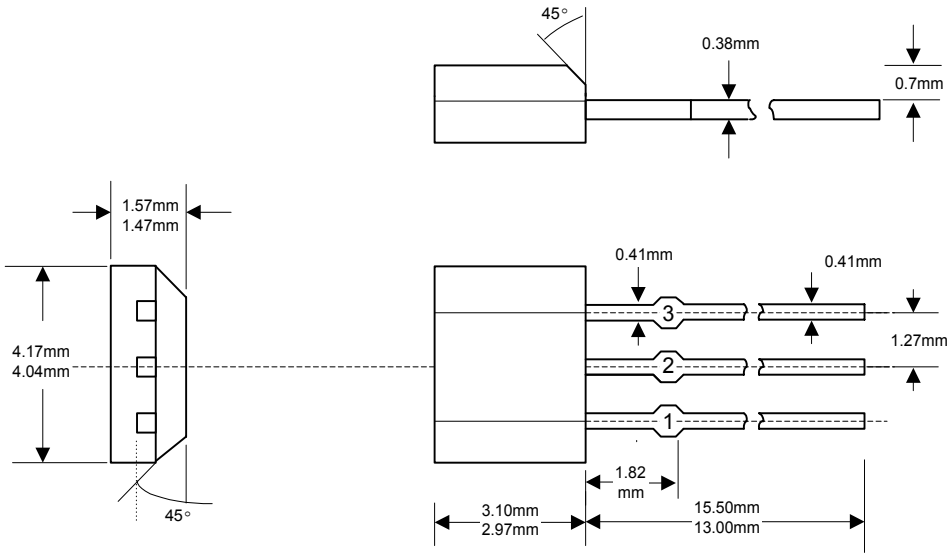


Active Area Depth



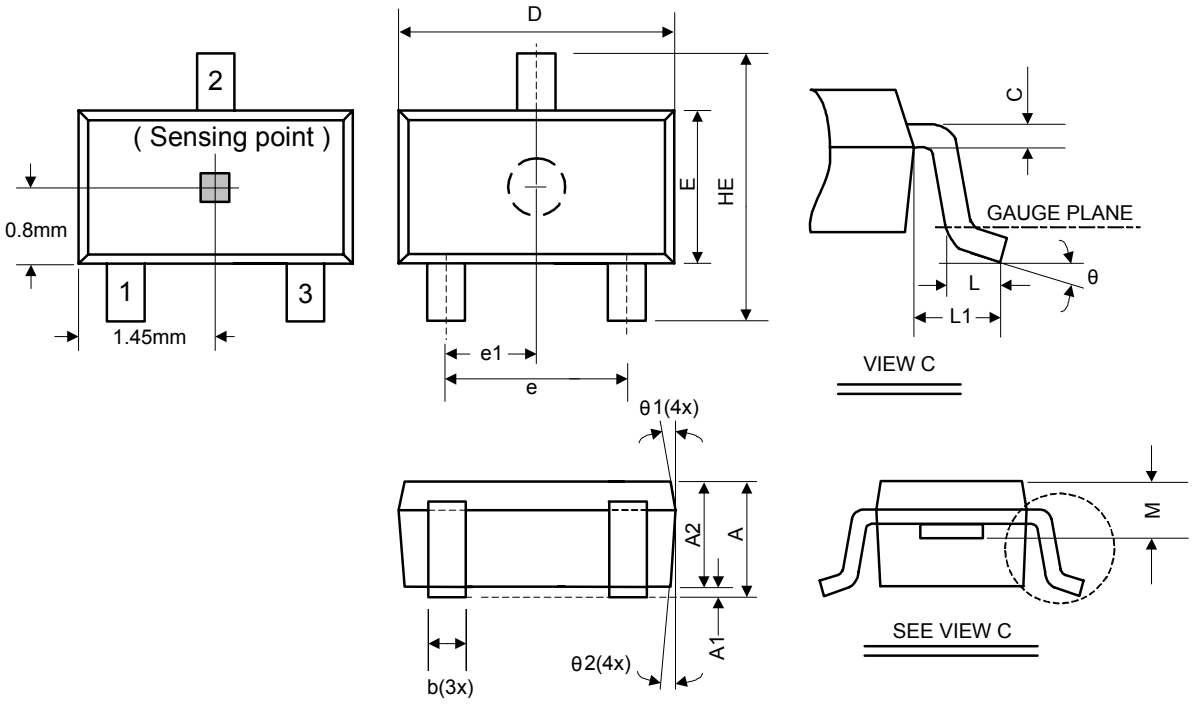
Sensor Location

Package Dimension



■ Package Information (Continued)

(2) Package Type: SOT23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.60	0.012	-	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
M	0.73	0.78	0.83	0.029	0.031	0.033
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
θ	0°	5°	10°	0°	5°	10°
θ1	3°	5°	7°	3°	5°	7°
θ2	6°	8°	10°	6°	8°	10°