

Internal Pull-up Hall Effect Latch

■ Features

- 2.2V to 20V DC operation voltage
- Built-in pull-up resistor
- 25mA output sink current
- Operating temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Package: SIP3, SOT23

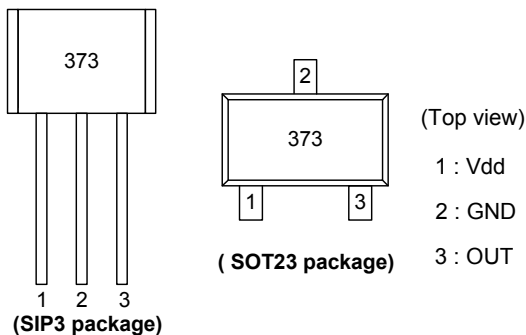
■ Applications

- Rotor position sensing
- Current switch
- Encoder
- RPM detection

■ General Description

AH373 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 bandgap 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 $B < \text{Brp}$. When $B < \text{Brp}$, the OUT pin go into "off" state.

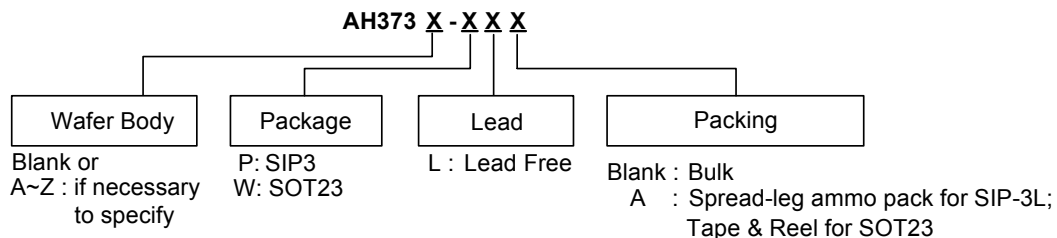
■ Pin Assignment



■ Pin Descriptions

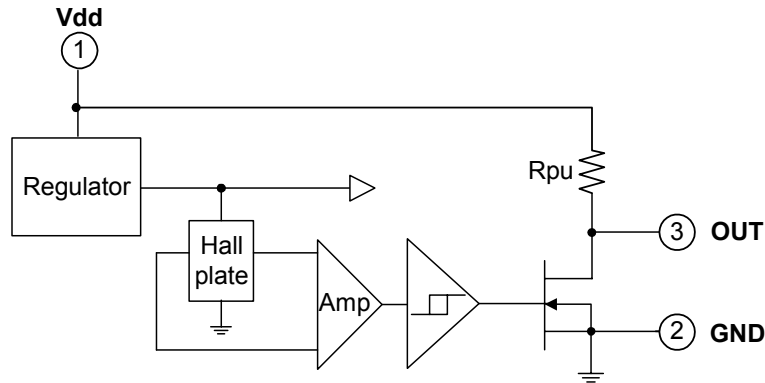
Name	Description
Vdd	Positive Power Supply
GND	Ground
OUT	Output Pin

■ Ordering Information



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■ Block Diagram



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

Characteristics	Symbol	Values	Unit
Supply voltage	Vdd	20	V
Output "off" voltage	Vout (off)	28	V
Output "on" current	Io (sink)	25	mA
Operating temperature range	Top	-40~+125	°C
Storage temperature range	Tstg	-65~+150	°C
Power dissipation	SIP	550	mW
	SOT23	230	mW

■ Recommended Operating Conditions

Paramter	Symbol	Conditions	Rating	Unit
Supply Voltage	Vdd	Operating	2.2*~20	V

*Note: 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 (Ta= 25°C, Vdd=12V)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output saturation voltage	Vout(sat)	Iout =20mA	-	300	400	mV
Output Leakage Current	Ioff	B < Brp	-	<0.1	10	uA
Supply current	Idd	OUT "OFF"	-	2	4	mA
Internal pull-up resistor	Rpu	—	7	10	13	KΩ

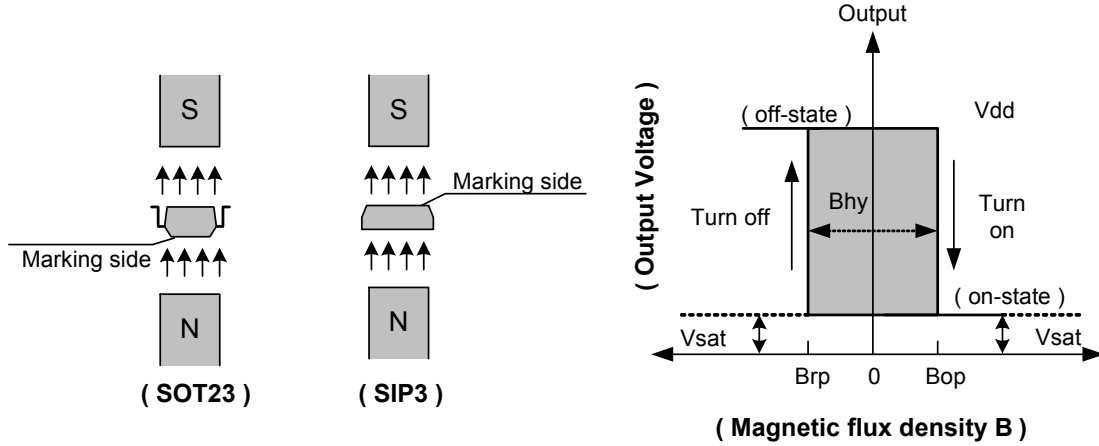
■ Magnetic Characteristics (Ta=25°C, Vdd=2.5V to 20V)

(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

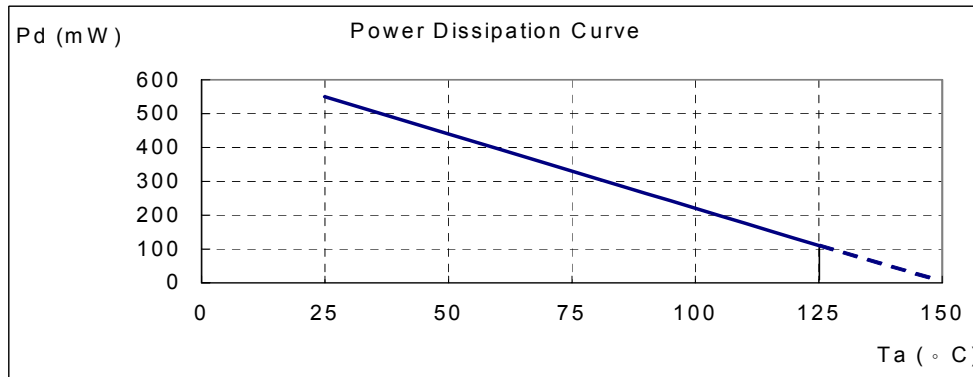
Internal Pull-up Hall Effect Latch

■ Operating Characteristics



■ Performance Characteristics (SIP3)

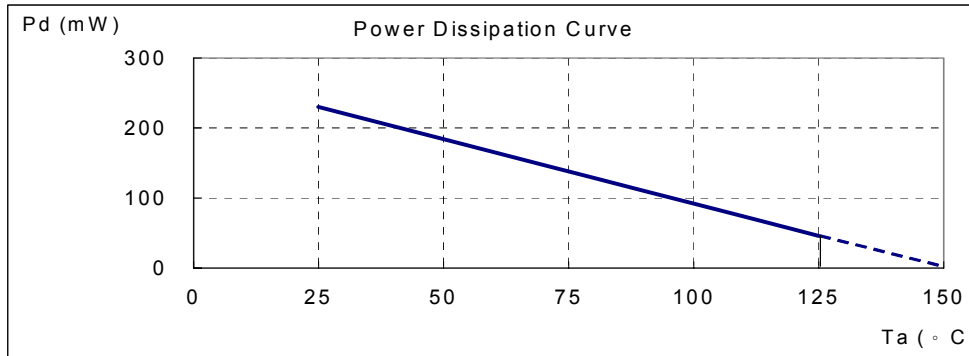
Ta (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
Ta (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



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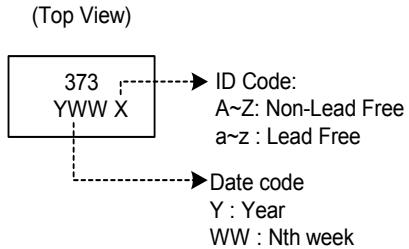
■ Performance Characteristics (SOT23-3)

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

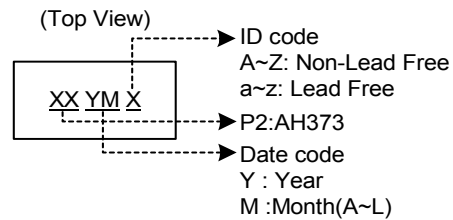


■ Marking Information

(1) SIP3



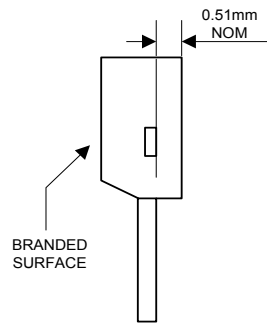
(2) SOT23



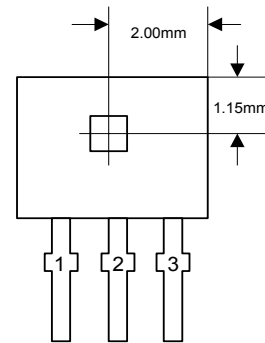
Internal Pull-up Hall Effect Latch

■ Package Information

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

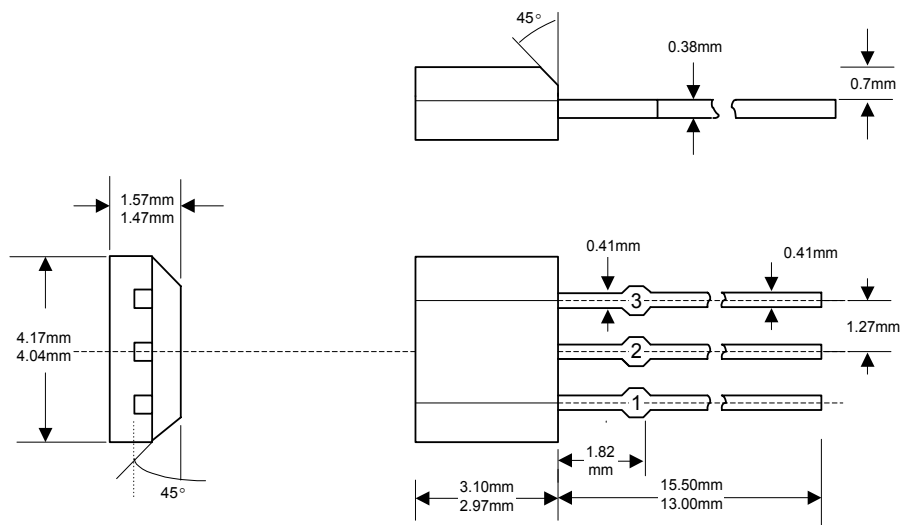


Active Area Depth



Sensor Location

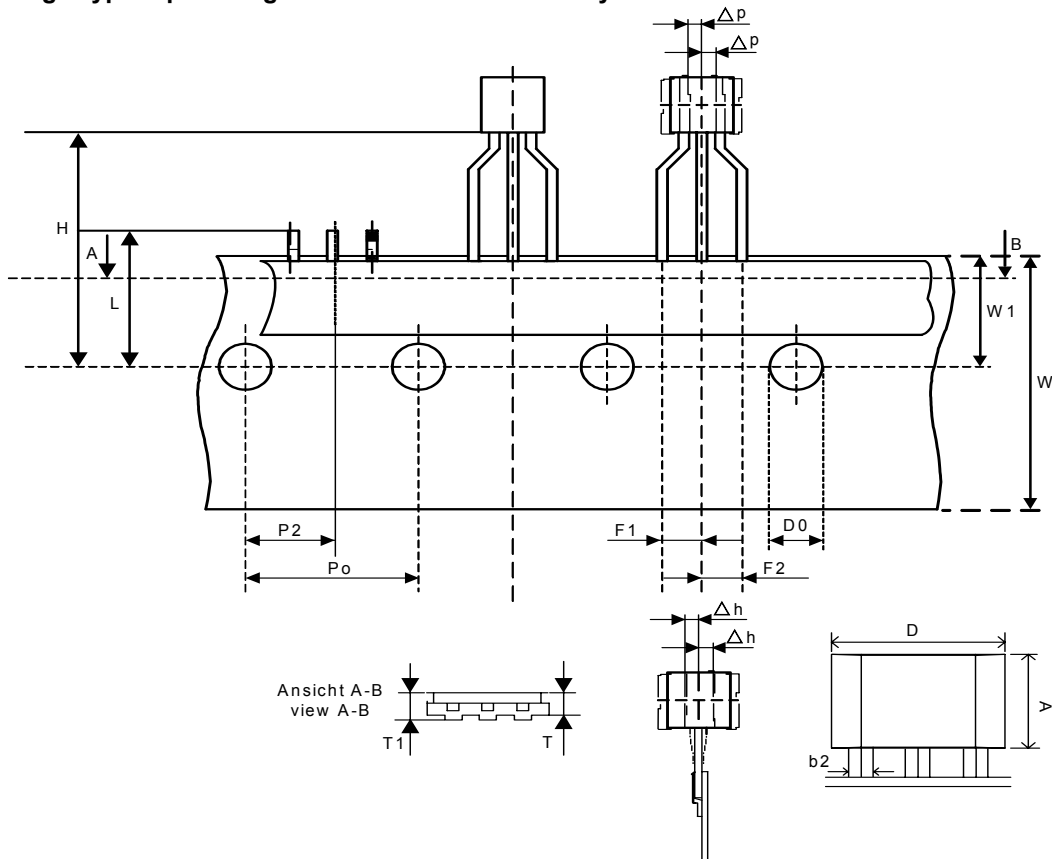
Package Dimension



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■ Package Information (Continued)

(2) Package Type: Spread leg SIP-3L for Ammo-Pack only

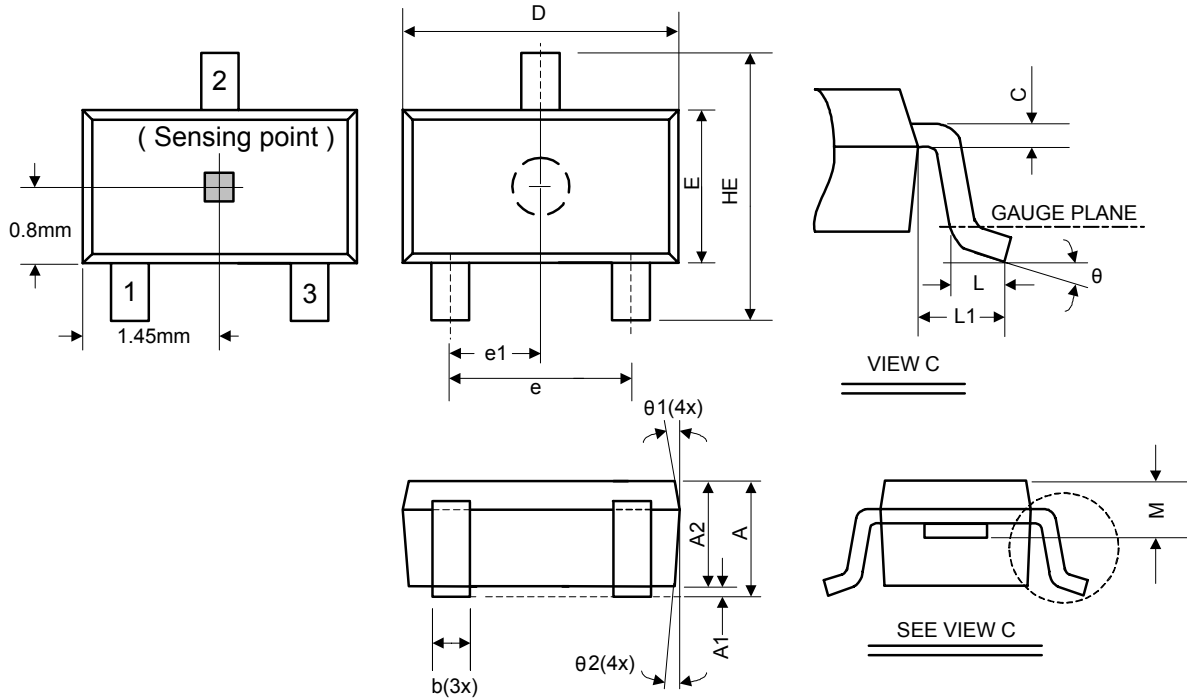


Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	2.80	3.00	3.20	0.110	0.118	0.125
D	3.90	4.10	4.30	0.153	0.161	0.169
b2	0.33	0.38	0.42	0.012	0.014	0.016
D0	3.80	4.00	4.20	0.149	0.157	0.165
F1	2.35	2.55	2.75	0.092	0.100	0.108
F2	2.45	2.55	2.85	0.096	0.100	0.112
H	-	-	20	-	-	0.787
Δh	-	-	1	-	-	0.039
L	-	-	11	-	-	0.433
P0	12.2	12.7	13.2	0.480	0.5	0.519
P2	5.95	6.35	6.75	0.234	0.25	0.265
Δp	-	-	1	-	-	0.039
T	-	-	0.55	-	-	0.021
T1	-	-	1.42	-	-	0.055
W	17.5	18.0	18.5	0.688	0.708	0.728
W1	5.5	6.0	6.5	0.216	0.236	0.255

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■ Package Information (Continued)

(3) 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°
θ_1	3°	5°	7°	3°	5°	7°
θ_2	6°	8°	10°	6°	8°	10°