

**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 provides a temperature compensated supply voltage for internal circuits and allows a wide operating supply 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 reversal falls below Brp. When **B** is less than Brp, the output is switched off.

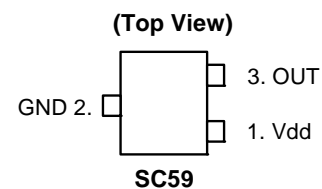
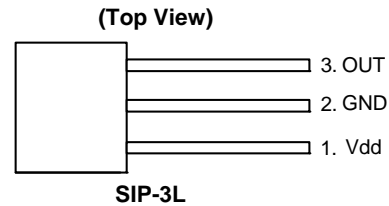
The AH375 is available in SIP-3L and SC59 packages.

**Features**

- Bipolar Hall-Effect latch sensor
- 2.2V to 20V DC Operating voltage
- Temperature compensation
- Open drain pre-driver
- 25mA maximum output sink current
- Operating temperature: -40°C to +125°C
- SIP-3L and SC59 packages  
(SC59 is commonly known as SOT23 in Asia)
- Green Molding Compound (No Br, Sb) (Note 1)

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).

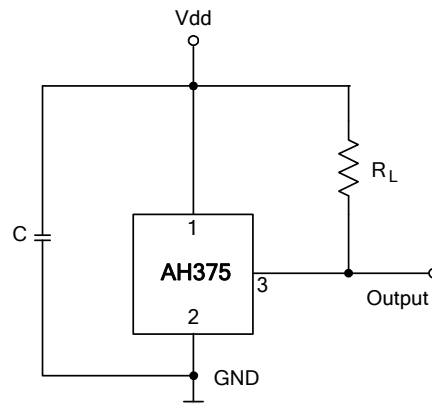
**Pin Assignments**



**Applications**

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

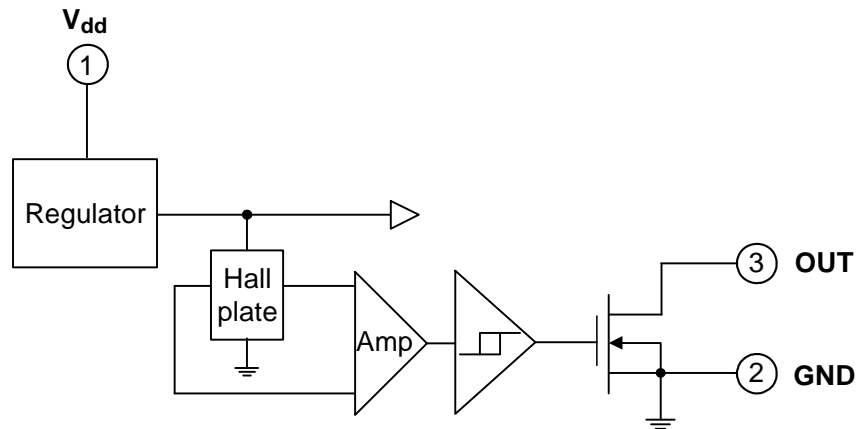
**Typical Application Circuit**



### Pin Descriptions

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

### Functional Block Diagram



### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Symbol	Characteristics		Values	Unit
Vdd	Supply Voltage		20	V
B	Magnetic Flux Density		Unlimited	
V <sub>DS</sub>	Output OFF Voltage		30	V
I <sub>d</sub>	Output "On" Current	Continuous	25	mA
T <sub>S</sub>	Storage Temperature Range		-65~+150	°C
T <sub>J(MAX)</sub>	Maximum Junction Temperature		150	°C
P <sub>D</sub>	Package Power Dissipation	SIP-3L	550	mW
		SC59	230	
$\theta_{JC}$	Thermal Resistance	SIP-3L	227	°C/W
		SC59	543	

### Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
Vdd	Supply Voltage (Note 2)	Operating	2.2	20	V
T <sub>A</sub>	Operating Ambient Temperature	Operating	-40	125	°C

Notes: 2. 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 ( $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{DD} = 12\text{V}$ )**

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

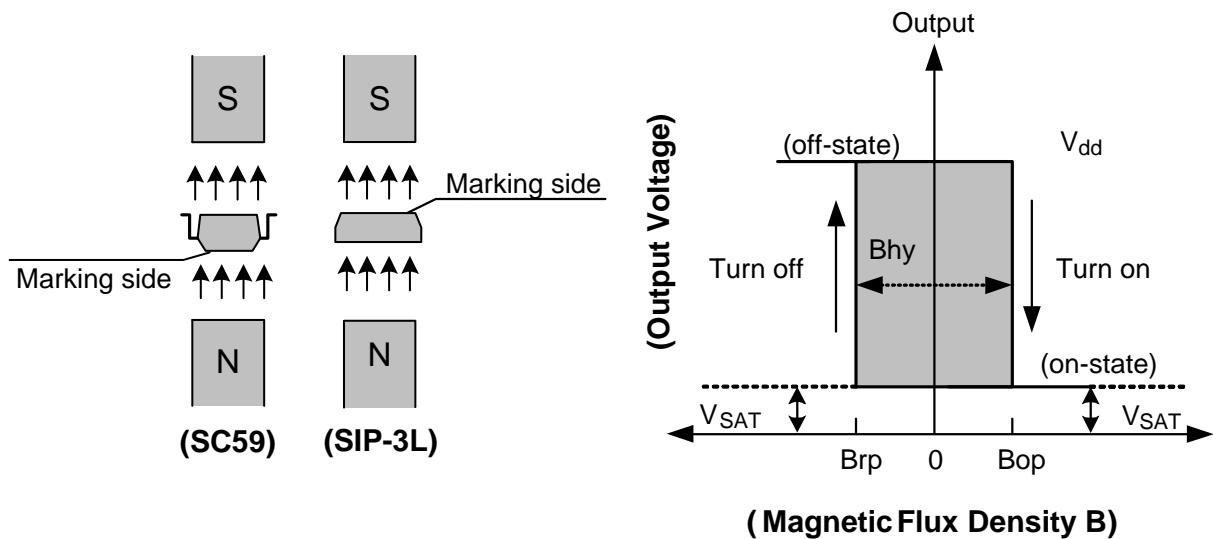
**Magnetic Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{DD} = 2.5\text{V to } 20\text{V}$ , Note 3)**

(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
$B_{hy}( B_{opx}  -  B_{rpx} )$	Hysteresis	-	60	-	Gauss

Notes: 3. Magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

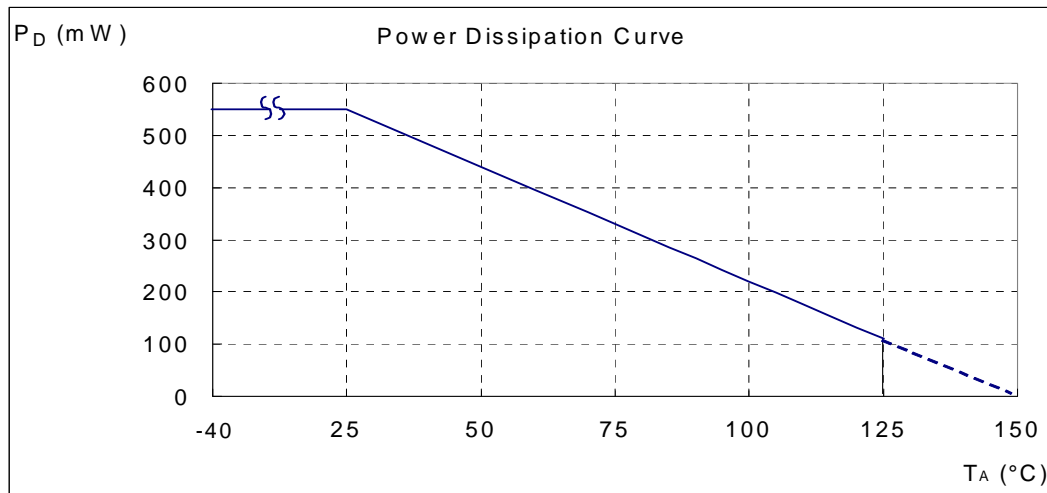
**Operating Characteristics**



**Performance Characteristics**

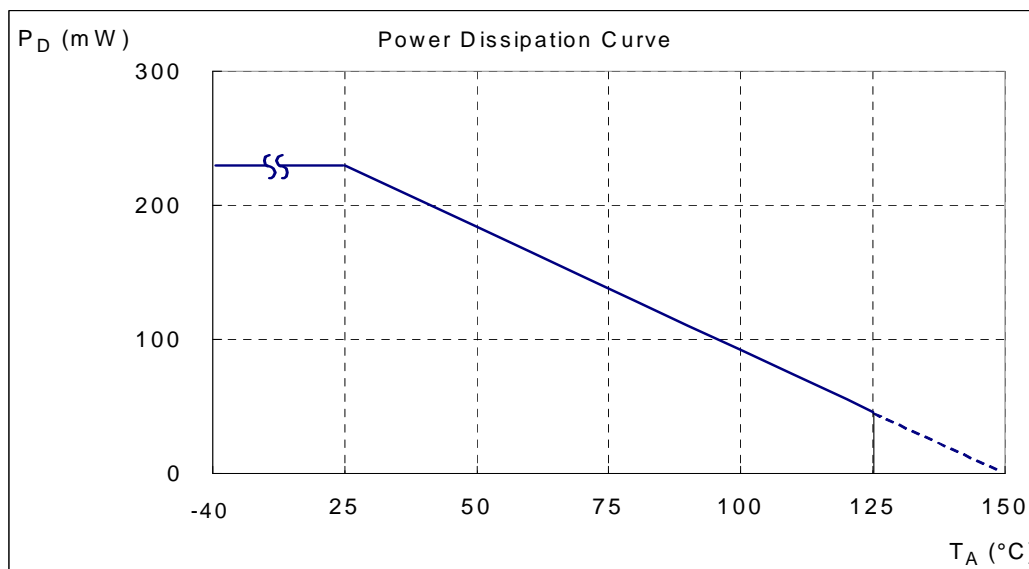
**(1) SIP-3L**

<b>T<sub>A</sub> (°C)</b>	<b>25</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>	<b>100</b>
P <sub>D</sub> (mW)	550	440	396	352	308	286	264	242	220
<b>T<sub>A</sub> (°C)</b>	<b>105</b>	<b>110</b>	<b>115</b>	<b>120</b>	<b>125</b>	<b>130</b>	<b>135</b>	<b>140</b>	<b>150</b>
P <sub>D</sub> (mW)	198	176	154	132	110	88	66	44	0

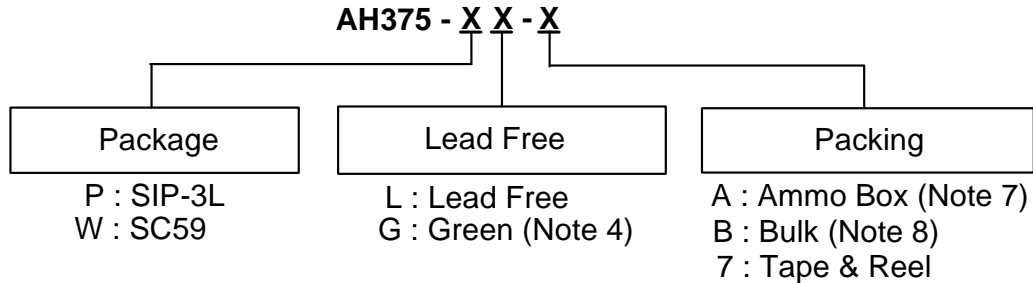








**(2) SC59 (commonly known as SOT23 in Asia)**

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



### Ordering Information

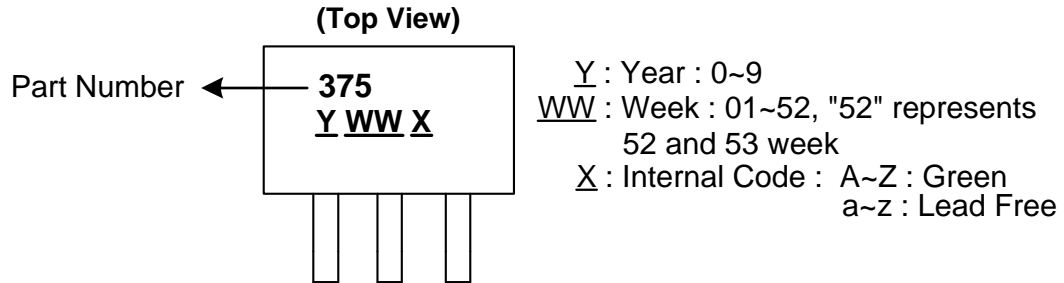


Device	Package Code	Packaging (Note 5, 6)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
 AH375-PL-A	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A
 AH375-PL-B	P	SIP-3L	1000	-B	NA	NA	NA	NA
 AH375-PG-A	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A
 AH375-PG-B	P	SIP-3L	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

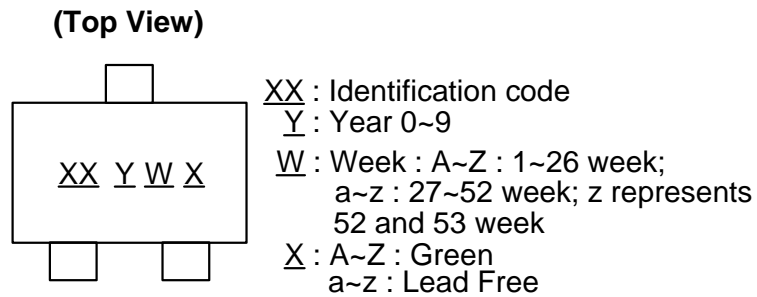
- Notes:
4. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).
  5. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  6. Reverse taping as shown on Diodes Inc. Surface Mount (SMD) Packaging document AP02007, which can be found on our website <http://www.diodes.com/datasheets/ap02007.pdf>.
  7. Ammo Box is for SIP-3L Spread Lead.
  8. Bulk is for SIP-3L Straight Lead.

**Marking Information**

**(1) SIP-3L**



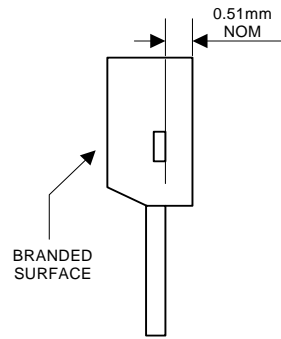
**(2) SC59 (Commonly known as SOT23 in Asia)**



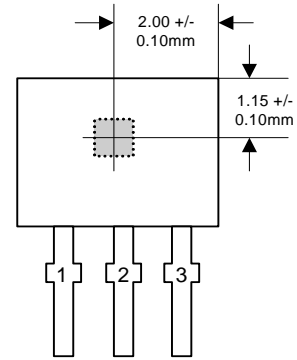
Part Number	Package	Identification Code
AH375	SC59	P3

**Package Outline Dimensions (All Dimensions in mm)**

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

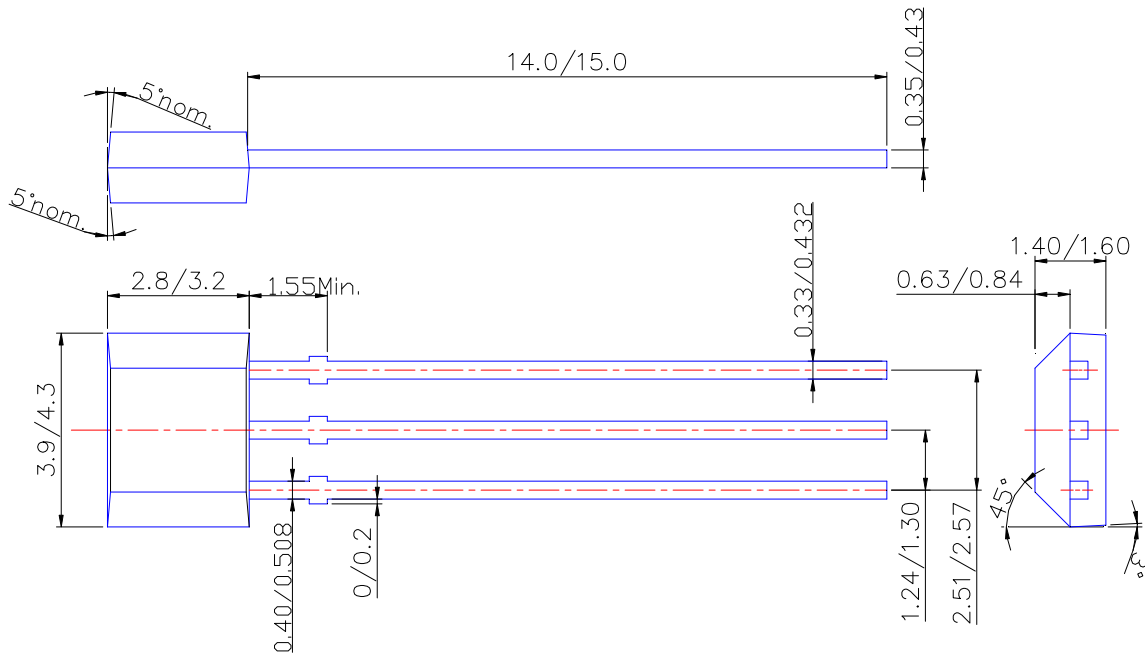


Active Area Depth



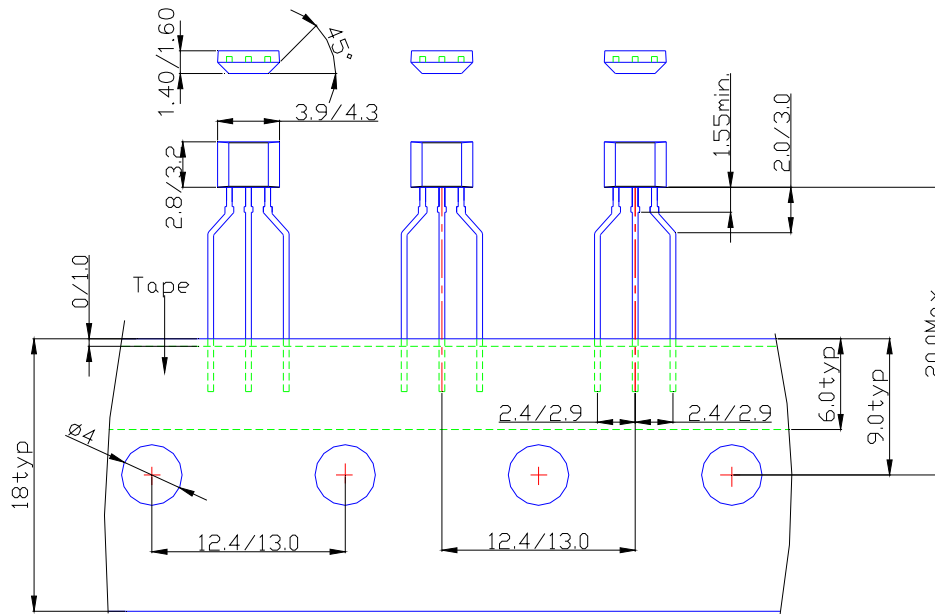
Sensor Location

**Package Dimension**

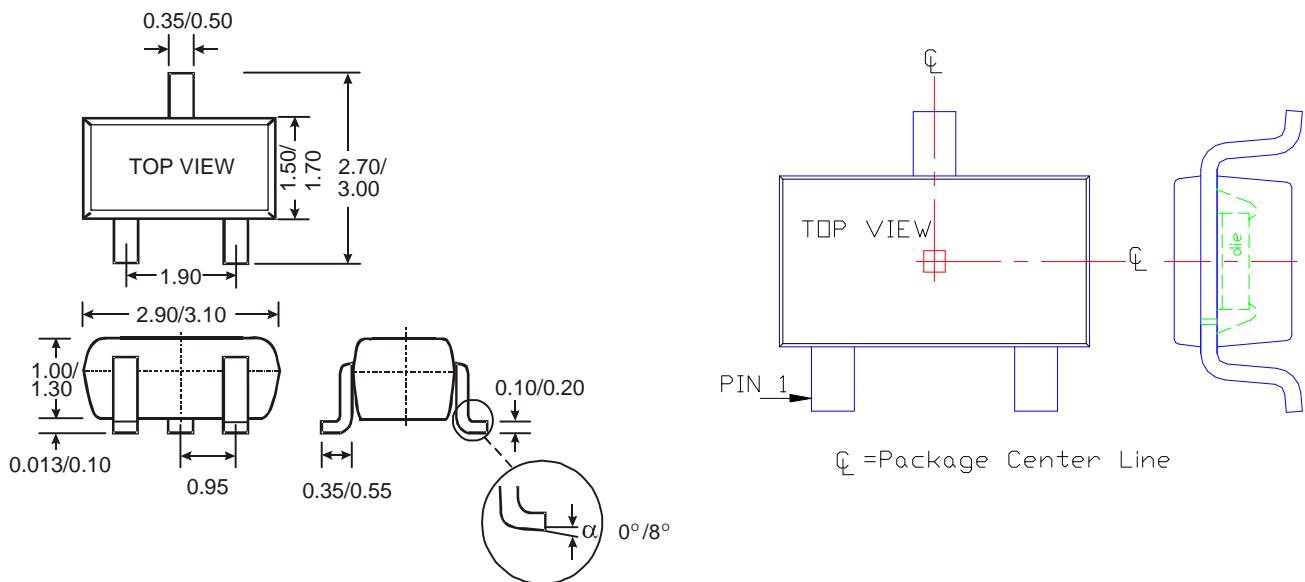


**Package Outline Dimensions (Continued)**

**(2) Package Type: SIP-3L for Ammo pack**



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





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