

Description

AH173 is a single-digital-output Hall-Effect latch 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, a comparator to provide switching hysteresis for noise rejection, and an output driver with a pull-up resistor (R_{pu}). 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 (**B_{op}**), output is switched on (OUT pin is pulled low). The output state is held on until a magnetic flux density reversal falls below B_{rp} . When **B** is less than B_{rp} , the output is switched off.

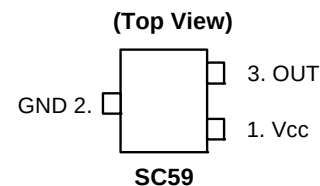
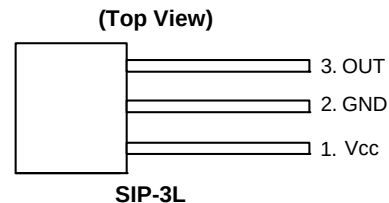
The AH173 is available in SIP-3L and SC59 packages.

Features

- Bipolar Hall-Effect latch sensor
- 3V to 20V DC operating voltage
- Built-in pull-up resistor
- 25mA 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.

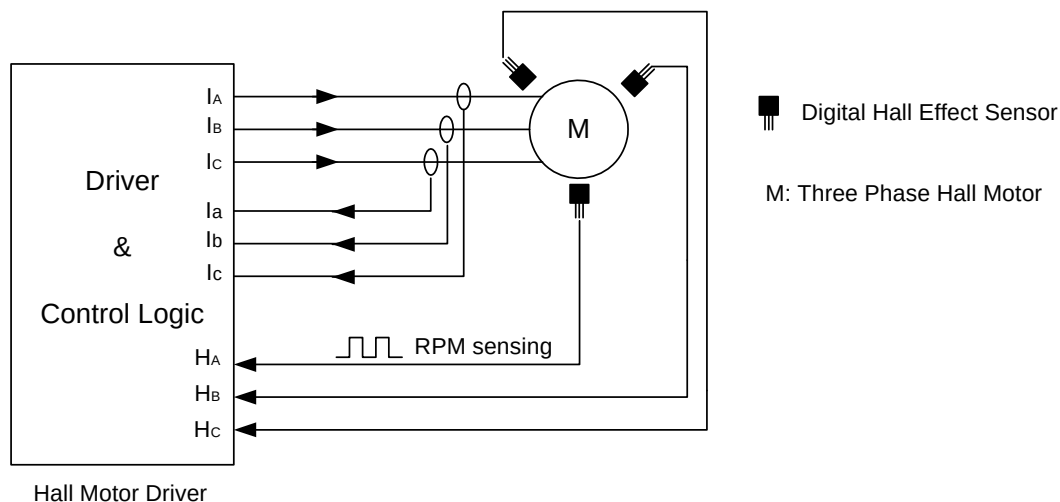
Pin Assignments



Applications

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection

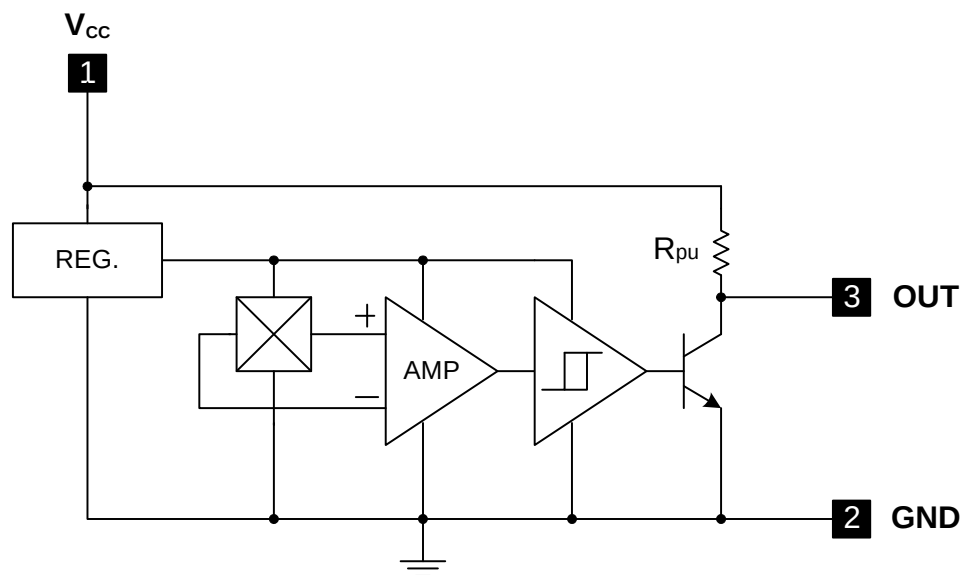
Typical Application Circuit



Pin Descriptions

Pin Name	Pin #	Description
V _{CC}	1	Positive Power Supply
GND	2	Ground
OUT	3	Output Stage

Functional Block Diagram



Absolute Maximum Ratings (T_A = 25°C)

Symbol	Characteristics	Values	Unit
V _{CC}	Supply Voltage	20	V
V _{OUT} (off)	Output "Off" Voltage	20	V
I _O (sink)	Output "On" Current	25	mA
T _S	Storage Temperature Range	-65~+150	°C
T _J	Maximum Junction Temperature	+150	°C
P _D	Power Dissipation	SIP-3L	550 mW
		SC59	230 mW

Recommended Operating Conditions

Symbol	Characteristic	Conditions	Min	Max	Unit
V _{CC}	Supply Voltage	Operating	3	20	V
T _A	Operating Ambient Temperature	Operating	-40	125	°C

Electrical Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
$V_{OUT(SAT)}$	Output Saturation Voltage	$V_{CC} = 12\text{V}$, OUT "ON" $I_O = 10\text{mA}$	-	300	400	mV
I_{CC}	Supply Current	$V_{CC} = 12\text{V}$, OUT "OFF"	-	3.5	6	mA
R_{pu}	Internal Pull-up Resistor		7	10	13	$K\Omega$
V_d	Dropout Voltage	$V_d = V_{CC} - V_{CE}$	-	-	0.3	V

Magnetic Characteristics ($T_A = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$, unless otherwise specified, Note 2)

(1mT = 10 Gauss)

A grade

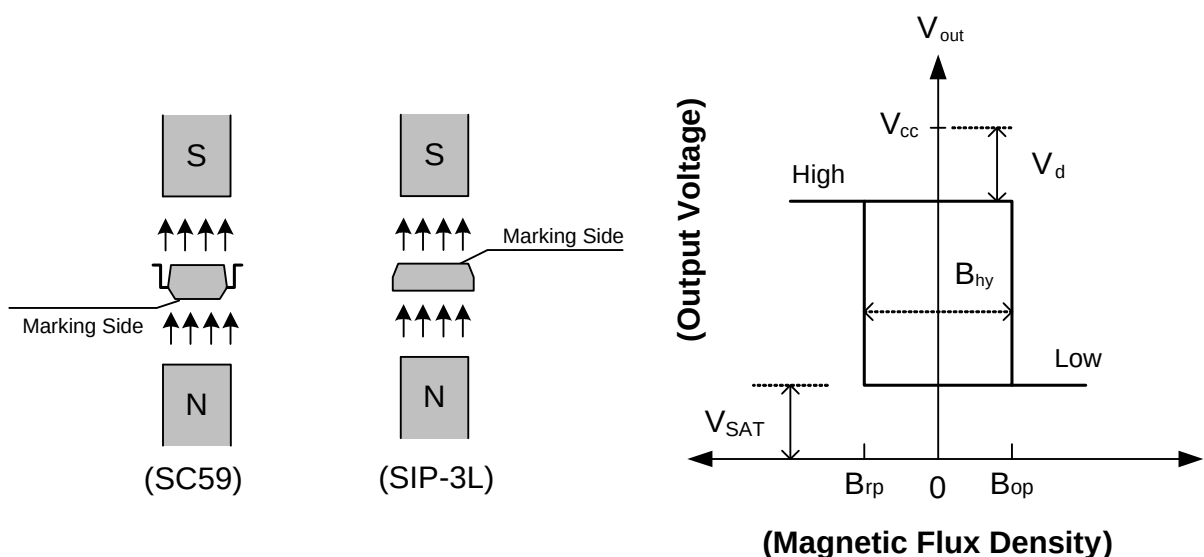
Symbol	Parameter	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operation Point	15	-	60	Gauss
Brps(south pole to brand side)	Release Point	-60	-	-15	Gauss
$B_{hy}(B_{opx} - B_{rpx})$	Hysteresis	-	80	-	Gauss

B grade

Symbol	Parameter	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operation Point	5	-	80	Gauss
Brps(south pole to brand side)	Release Point	-80	-	-5	Gauss
$B_{hy}(B_{opx} - B_{rpx})$	Hysteresis	-	80	-	Gauss

Notes: 2. Magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

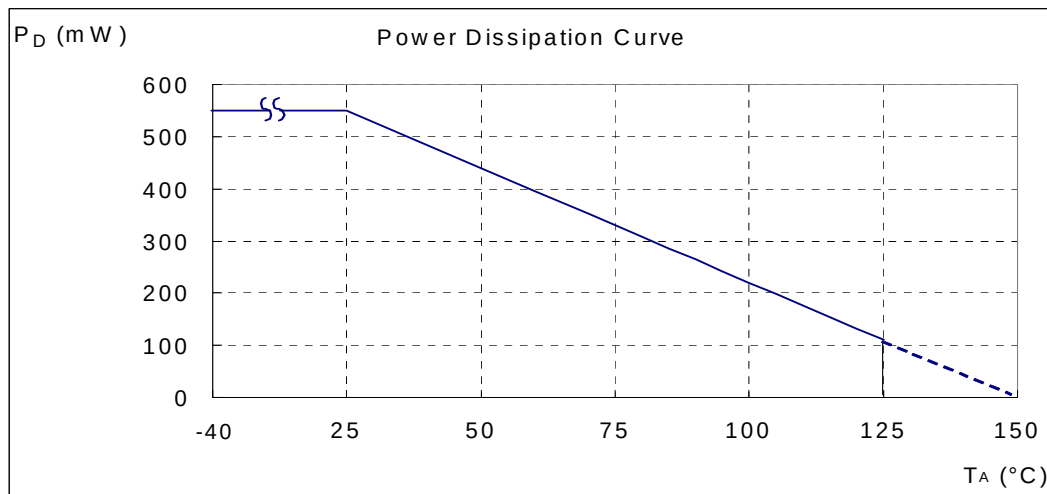
Operating Characteristics



Performance Characteristics

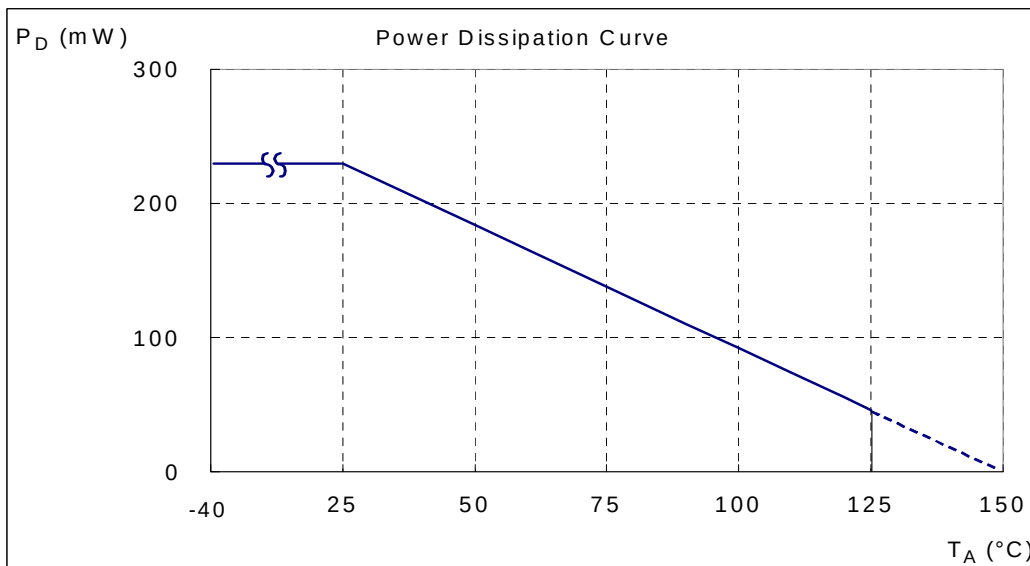
(1) SIP-3L

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

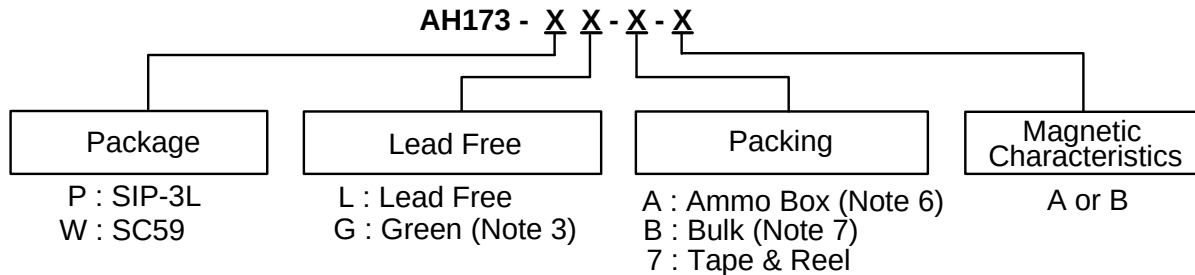


(2) SC59 (commonly known as SOT23 in Asia)

T _A (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P _D (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



Ordering Information

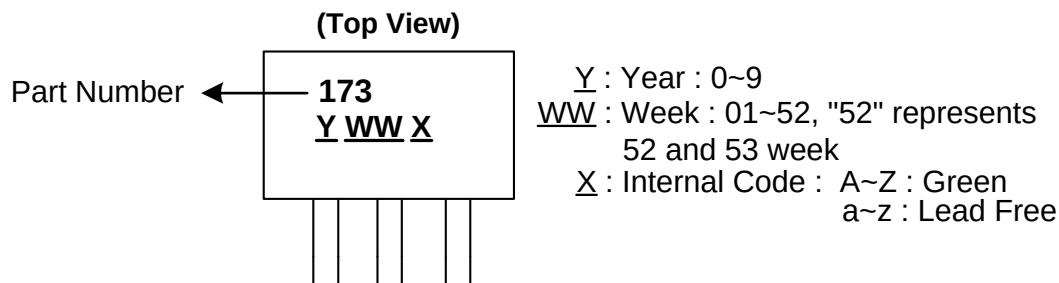


Device	Package Code	Packaging (Note 4, 5)	Tube/Bulk		7" Tape and Reel		Ammo Box		Magnetic Characteristics
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix	
 AH173-PL-A-A	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	A
 AH173-PL-A-B	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	B
 AH173-PG-A-A	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	A
 AH173-PG-A-B	P	SIP-3L	NA	NA	NA	NA	4000/Box	-A	B
 AH173-PL-B-A	P	SIP-3L	1000	-B	NA	NA	NA	NA	A
 AH173-PL-B-B	P	SIP-3L	1000	-B	NA	NA	NA	NA	B
 AH173-PG-B-A	P	SIP-3L	1000	-B	NA	NA	NA	NA	A
 AH173-PG-B-B	P	SIP-3L	1000	-B	NA	NA	NA	NA	B
 AH173-WL-7-A	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA	A
 AH173-WL-7-B	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA	B
 AH173-WG-7-A	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA	A
 AH173-WG-7-B	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA	B

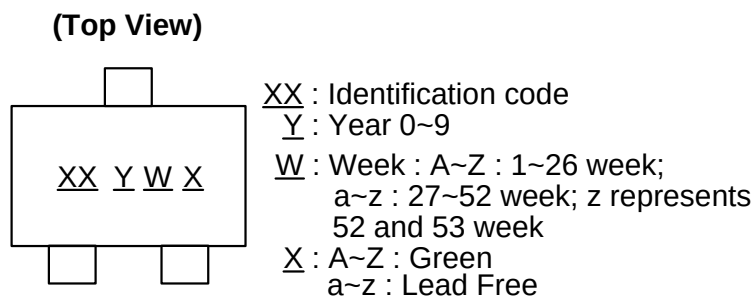
- Notes:
3. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.
 4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.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

Marking Information

(1) SIP-3L



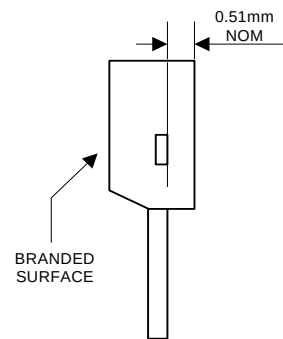
(2) SC59 (Commonly known as SOT23 in Asia)



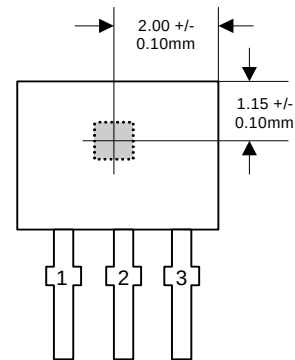
Part Number	Package	Identification Code
AH173	SC59	J3

Package Outline Dimensions (All Dimensions in mm)

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

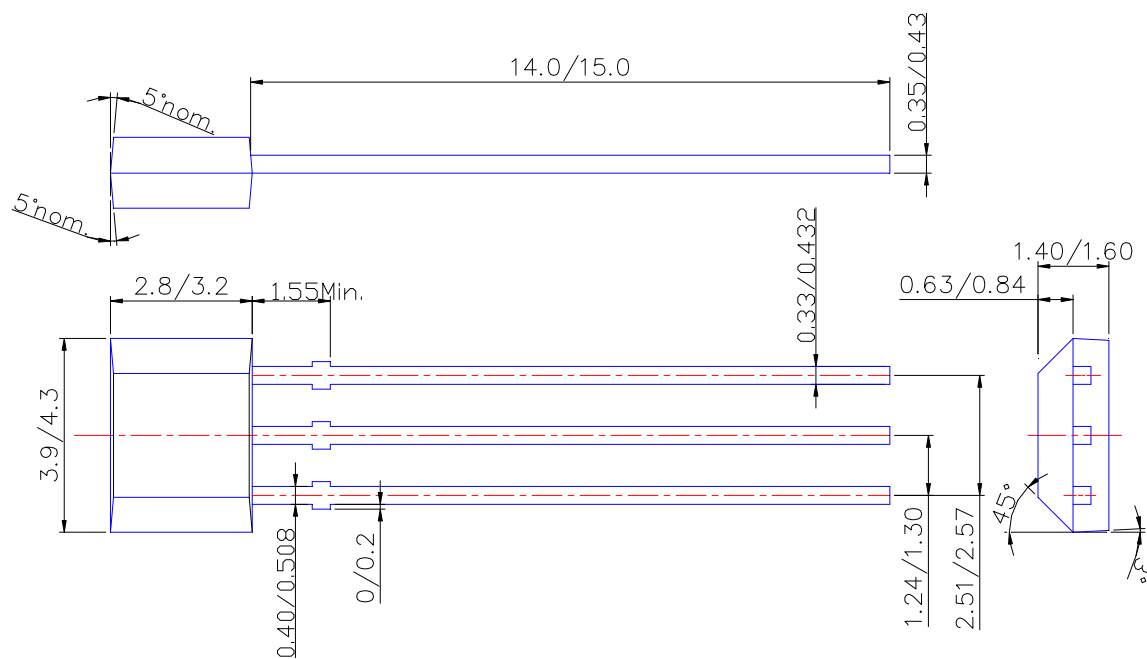


Active Area Depth



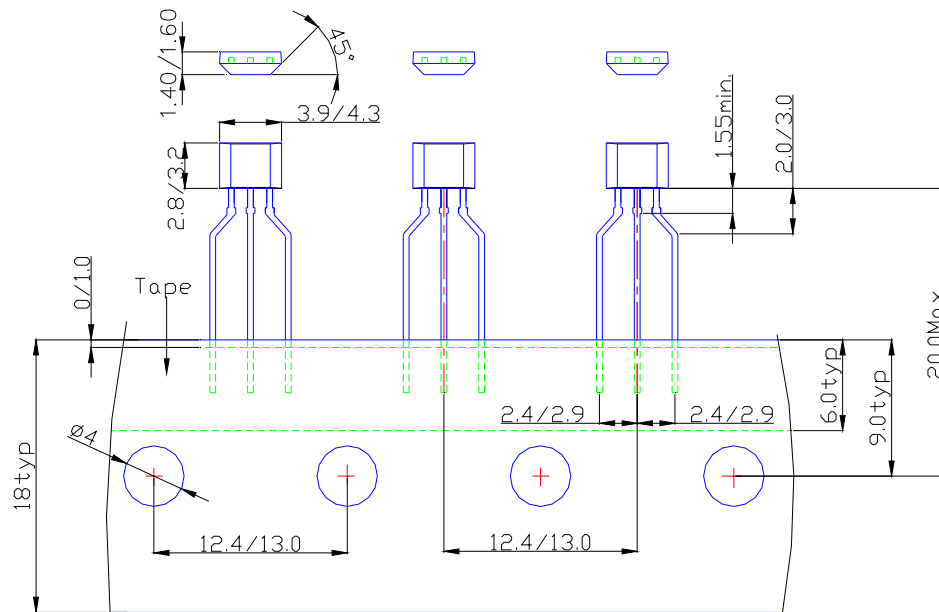
Sensor Location

Package Dimension

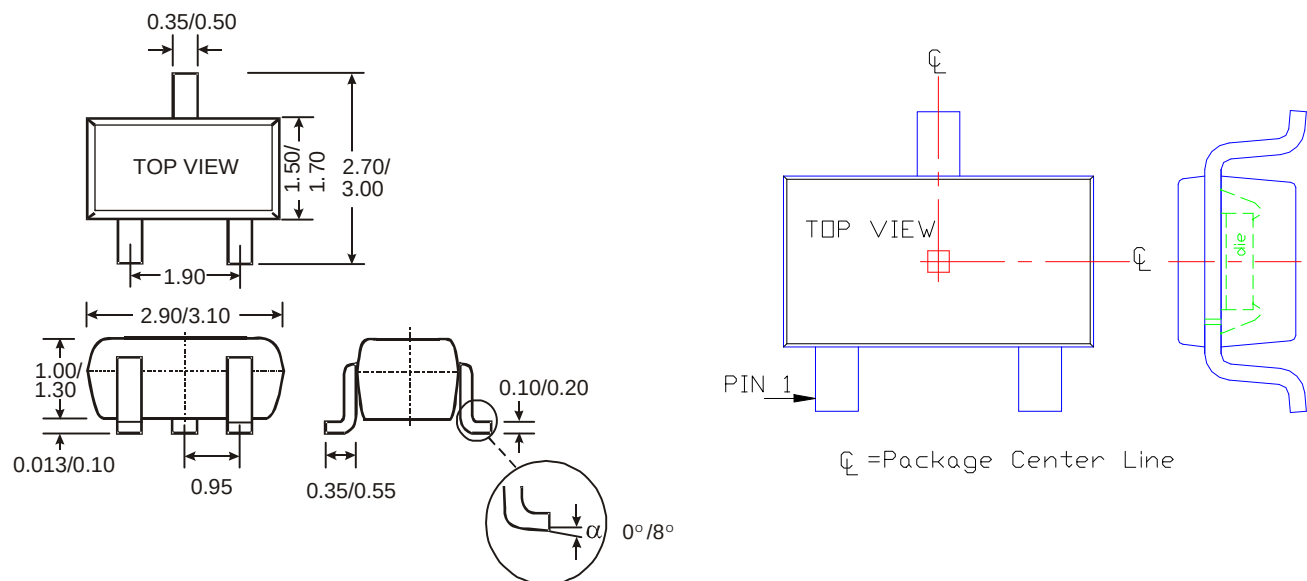


Package Outline Dimensions (Continued)

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



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



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