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**Features**

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- 3V to 28V DC operation voltage
- Chopper stabilized
- Wide operating voltage range
- Built-in power reverse protection
- Built-in voltage overshoot protection
- Output short circuit protection
- Open drain pre-driver
- SIP3 and SC59 (Commonly known as SOT23 in Asia)  
: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/RoHS Compliant (Note 1)

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**General Description**

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AH3761 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  $B_{op}$ , DO is turned on (low). The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  causing DO to be turned off (high).

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**Application**

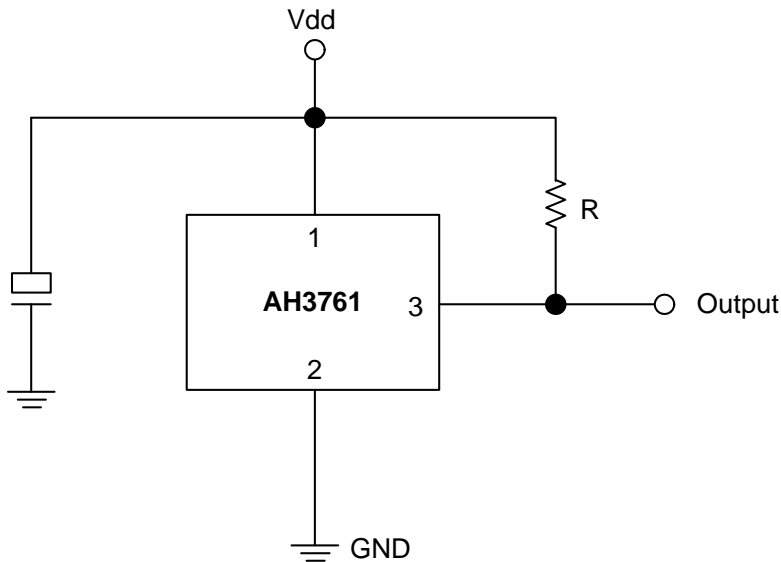
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- Brush-less DC Motor Commutation
- RPM Detection
- Consumer and industrial position sensor
- Flow meters

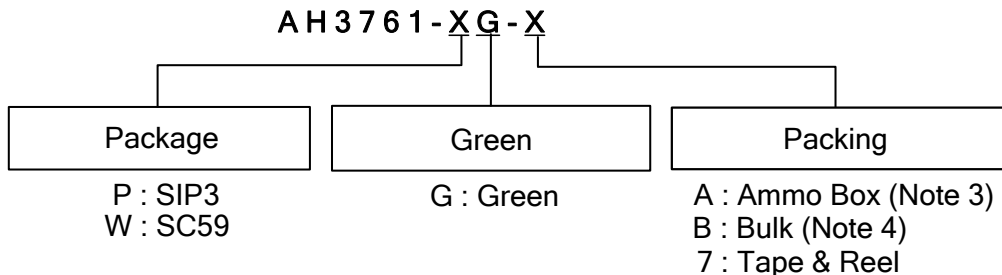
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**Typical Application Circuit**

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### Ordering Information



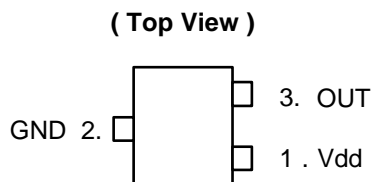
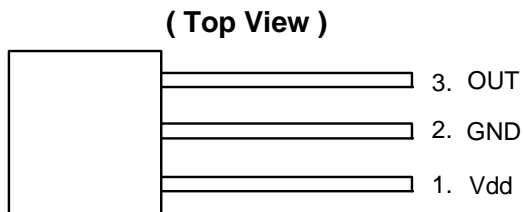
Device	Package Code	Packaging (Note 2)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH3761-PG-A	P	SIP3	NA	NA	NA	NA	4000/Box	-A
AH3761-PG-B	P	SIP3	1000	-B	NA	NA	NA	NA
AH3761-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

- 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)
  2. 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>.
  3. Ammo Box is for SIP3 Spread Lead.
  4. Bulk is for SIP3 Straight Lead.

### Pin Assignments

(1) SIP3

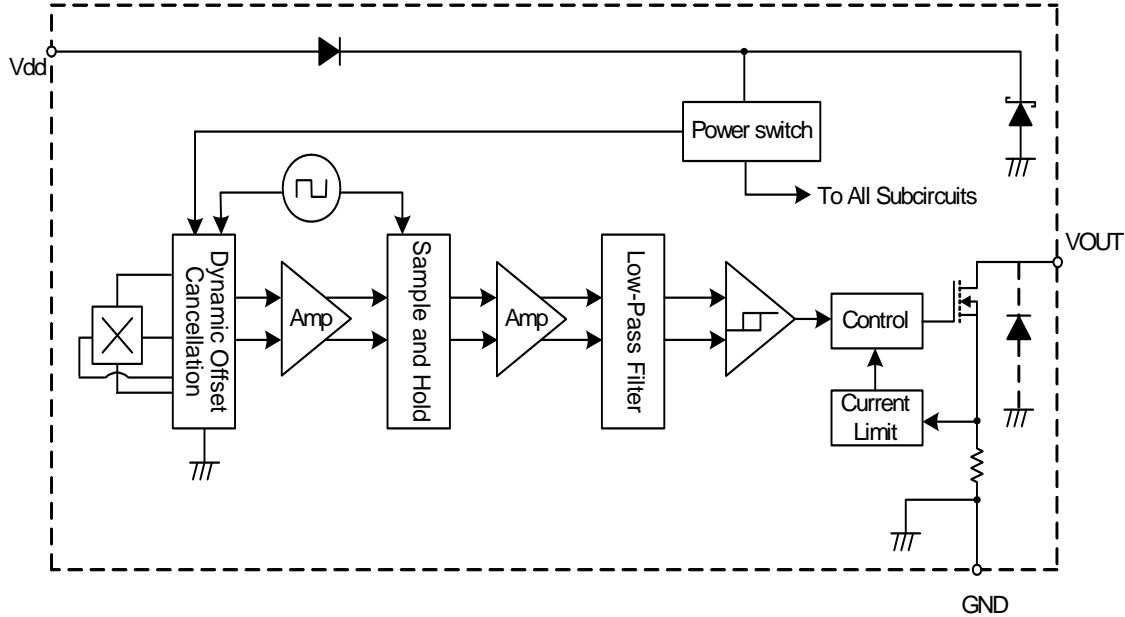
(2) SC59



### Pin Descriptions

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

**Block Diagram**



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

Symbol	Characteristics	Values	Unit
Vdd	Supply Voltage	30	V
Vrdd	Reverse Battery Voltage	-30	V
B	Magnetic Flux Density	Unlimited	
V <sub>DS</sub>	Output OFF Voltage	30	V
I <sub>O(peak)</sub>	Output "On" Current (Peak)	100	mA
T <sub>ST</sub>	Storage Temperature Range	-65~+150	°C
T <sub>J(MAX)</sub>	Maximum Junction Temperature	150	°C
P <sub>D</sub>	Package Power Dissipation	SIP3	550 mW
		SC59	230 mW
$\theta_{JC}$	Thermal Resistance Junction to case	SIP3	227 °C/W
		SC59	543 °C/W

**Recommended Operating Conditions**

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
Vdd	Supply Voltage	Operating	3	24	28	V
T <sub>A</sub>	Operating Ambient Temperature	Operating	-40	-	125	°C

### Electrical Characteristics (T<sub>A</sub> = + 25°C, V<sub>dd</sub> = 24V, Note 7)

Symbol	Characteristic	Test Conditions	Min	Typ.	Max	Unit
V <sub>o(sat)</sub>	Output Saturation Voltage	I <sub>out</sub> = 20mA, B > B <sub>op</sub>	-	300	500	mV
I <sub>off</sub>	Output Leakage Current	V <sub>O</sub> = 24V, B < B <sub>op</sub>	-	< 0.1	10	µA
I <sub>dd</sub>	Supply Current	Output Open	-	4	6	mA
t <sub>r</sub>	Output Rising Time	R <sub>L</sub> = 10KΩ, C <sub>L</sub> = 16pF	-	340	-	ns
t <sub>f</sub>	Output Falling Time	R <sub>L</sub> = 10KΩ, C <sub>L</sub> = 16pF	-	20	-	ns
f <sub>c</sub>	Chopping Frequency		-	300	-	KHz
I <sub>OM</sub>	Output Current Limit	B > B <sub>op</sub> (Note 5)	50	70	90	mA
t <sub>ST</sub>	Start-up time of IC	V <sub>dd</sub> > 3V, B > B <sub>op</sub> (Note 6)	-	47	-	µs

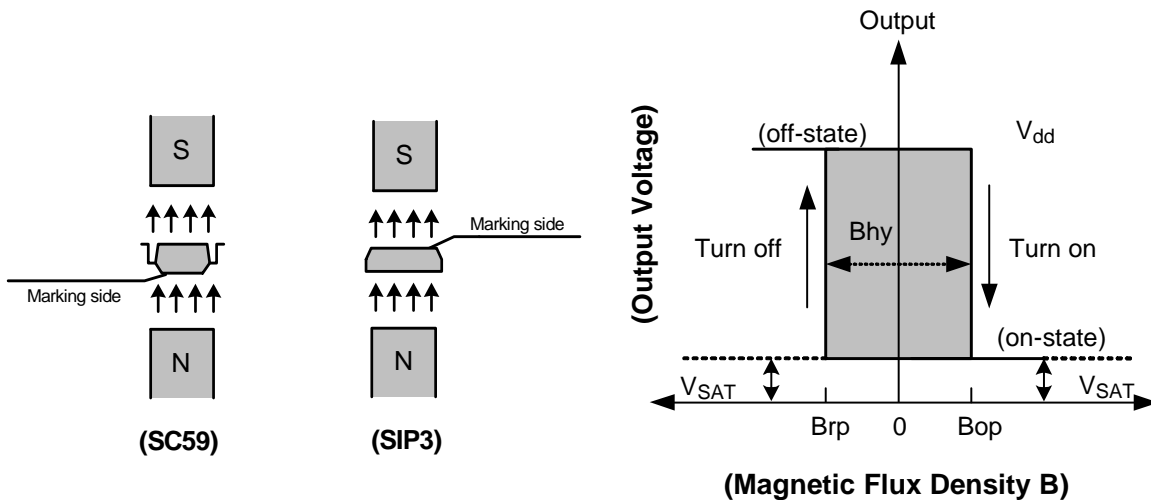
Notes: 5. The device will shut down operating after the output current I<sub>O</sub> is over the output current limit I<sub>OM</sub> for 160µs (typically). The device will re-start up operating after resetting the supply voltage V<sub>dd</sub>.  
 6. I<sub>n</sub> initial power on time, the output state is kept in "High" in this start-up time of IC.  
 7. Typical data is at T<sub>A</sub> = +25°C, V<sub>dd</sub> = 24V and is design information only.

### Magnetic Characteristics (T<sub>A</sub> = + 25°C, V<sub>dd</sub> = 3V to 28V, Note 8)

(1mT = 10Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
B <sub>op</sub>	Operate Point	5	30	60	Gauss
B <sub>rp</sub>	Release Point	-60	-30	-5	Gauss
B <sub>hys</sub>	Hysteresis	-	60	-	Gauss

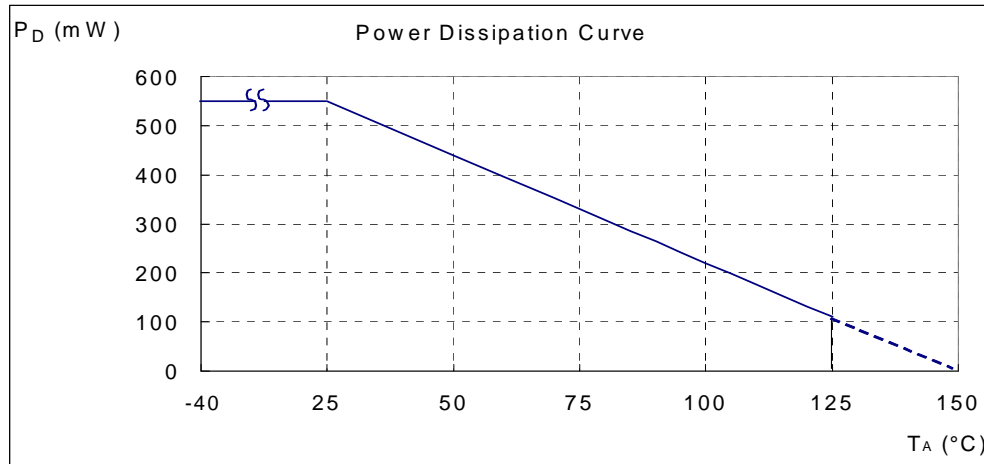
Notes: 8. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



**Performance Characteristics**

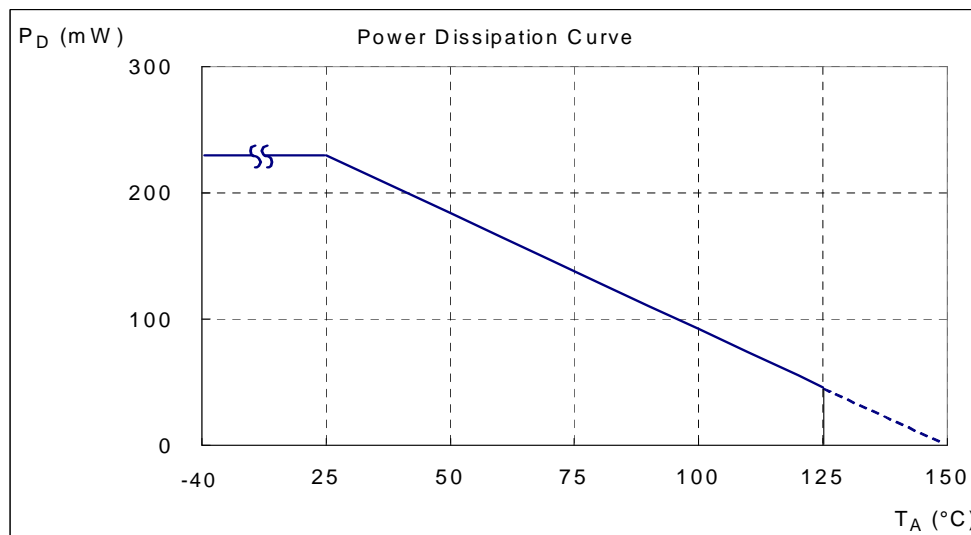
(1) SIP3

<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



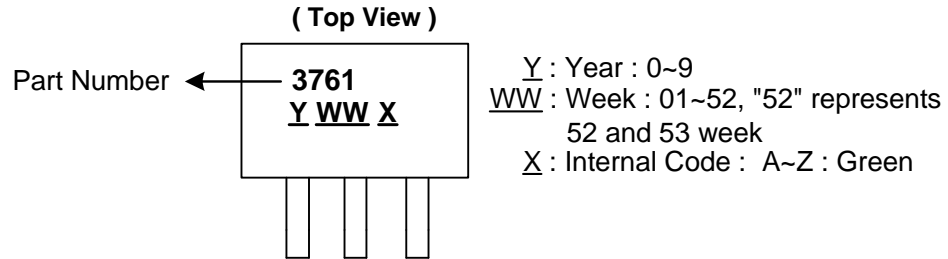
(2) SC59 (Commonly known as SOT23 in Asia)

<b>T<sub>A</sub> (°C)</b>	<b>25</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>	<b>100</b>	<b>110</b>	<b>120</b>	<b>125</b>	<b>130</b>	<b>140</b>	<b>150</b>
P <sub>D</sub> (mW)	230	184	166	147	129	110	92	74	55	46	37	18	0

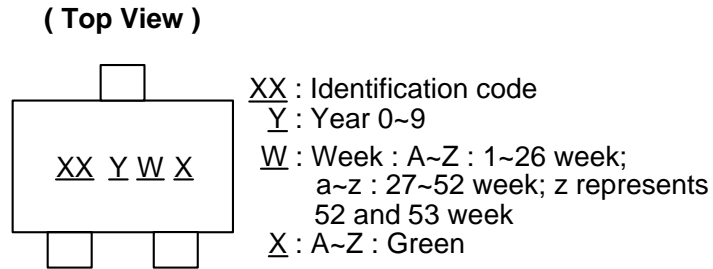


**Marking Information**

(1) SIP3



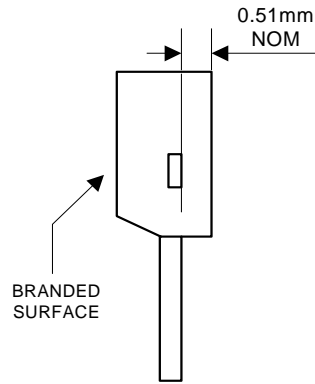
(2) SC59 (Commonly known as SOT23 in Asia)



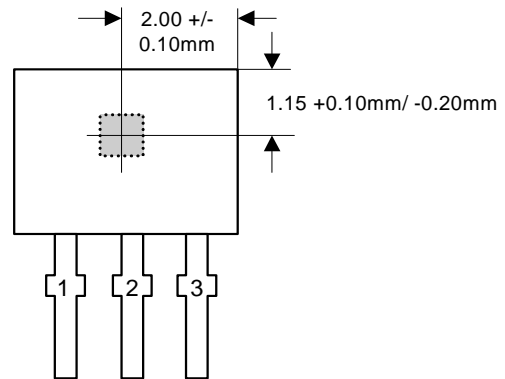
Part Number	Package	Identification Code
AH3761	SC59	P8

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

(1) Package Type: SIP3 for Bulk only

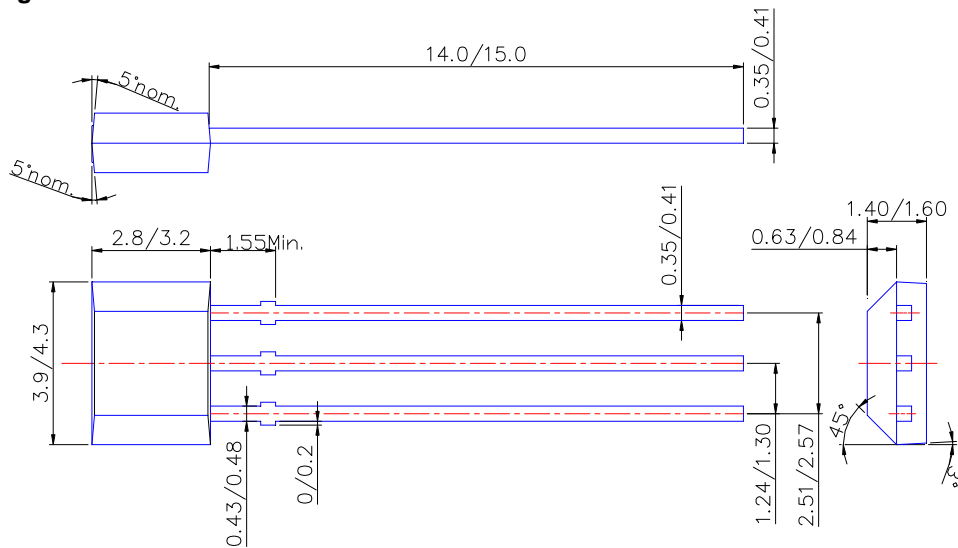


Active Area Depth



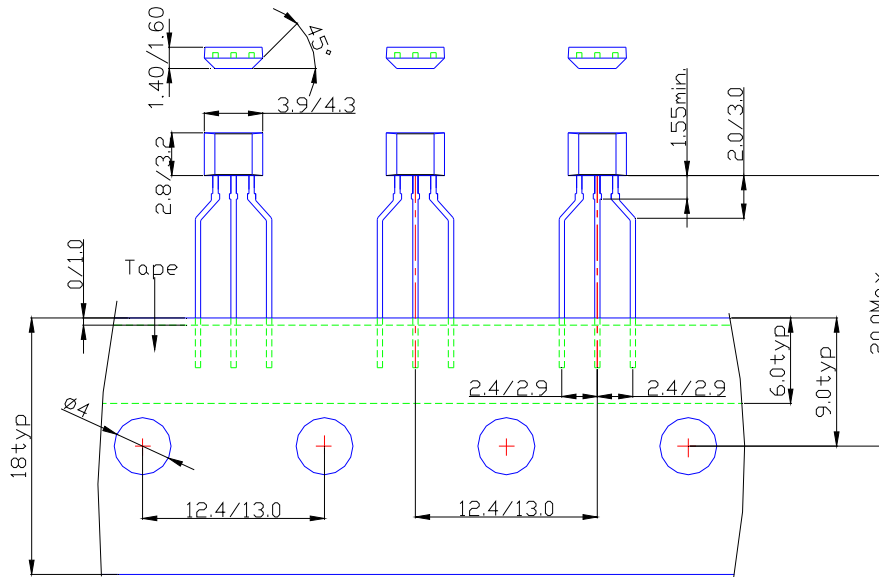
Sensor Location

**Package Dimension**

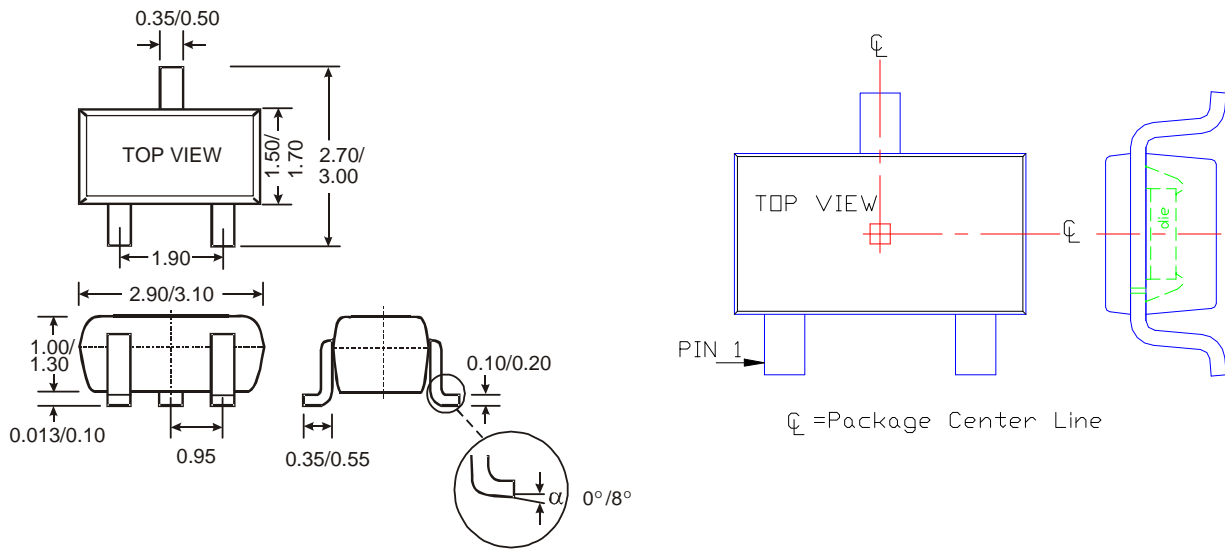


**Package Information (Continued)**

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



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





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