Description

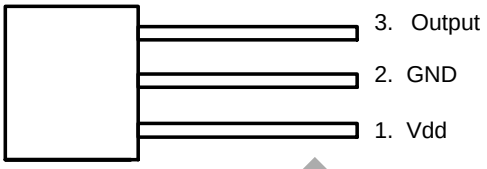
DIODES™ AH182/DIODES™ AH183 is a three-terminal Hall effect sensor device with an output driver, mainly designed for battery-operation, hand-held equipment (such as cellular and cordless phones, and PDA's). The total operation power is down to 15µW in the 2.75V supply.

The south pole of sufficient strength will turn the output on in SIP-3L but the north pole of sufficient strength will turn the output on in SC59 package. The output will be turned off under no magnetic field.

While the magnetic flux density **(B)** is larger than operation point **(Bop)**, the output will be turned on (low), the output is held until **B** is lower than the release point **(Brp)**, then turned off. The difference between AH182 and AH183 is that the former consumes less power than that of the latter in the Hall sensor operation.

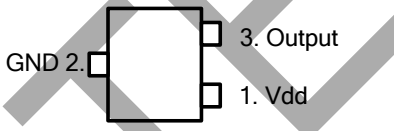
Pin Assignments

(Top view)



SIP-3L

(Top view)



SC59 (Commonly known as SOT23 in Asia)

Features

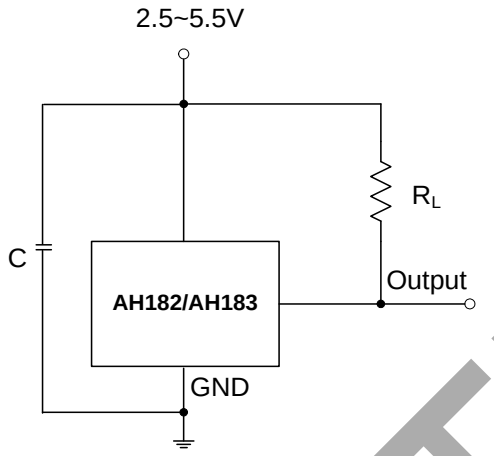
- Micropower Operation
- 2.5V to 5.5V Battery Operation
- Offset Canceling Technology
- Superior Temperature Stability
- Extremely Low Switch-Point Drift
- Insensitive to Physical Stress
- -40°C to +85°C Operating Temperature
- Available in "Green" Packages: SIP-3L and SC59 (Commonly Known as SOT23 in Asia)
  - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
  - **Halogen and Antimony Free. "Green" Device (Note 3)**
- Lead-Free Packages, Available in "Green" Molding Compound: SIP-3L and SC59
  - **Totally Lead-Free & Fully RoHS Compliant (Notes 4 & 2)**
  - **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Applications

- Cover detectors
- Speed measurements
- Home safeties

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.

Typical Applications Circuit

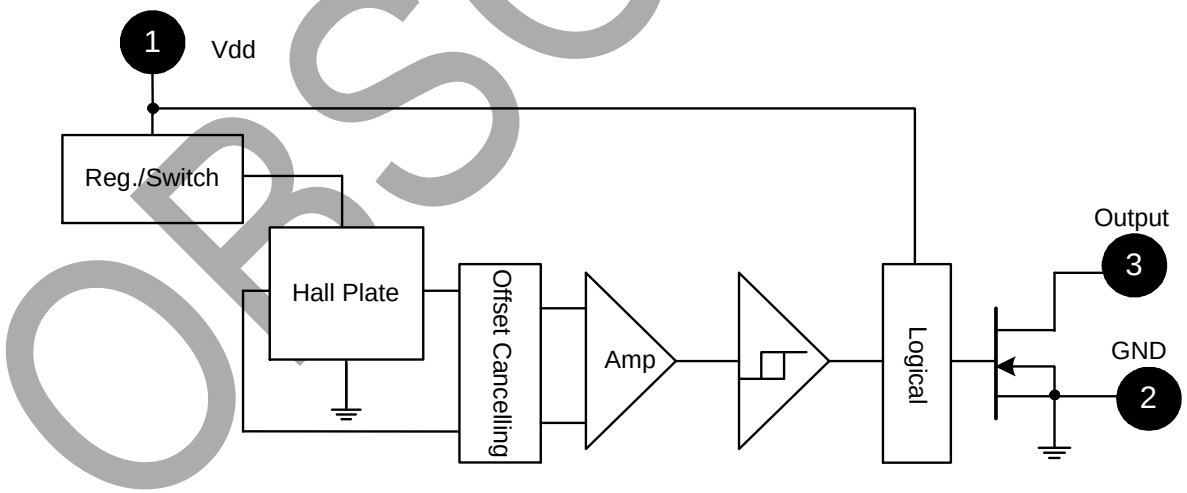


* C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.
R_L is the pull-up resistor, the recommended resistance is 10Kohm~100Kohm.

Pin Descriptions

Pin Name	P/I/O	Pin Number	Description
Vdd	P/I	1	Power Supply Input
GND	P	2	Ground
Output	O	3	Output Pin

Functional Block Diagram



Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter		Rating	Unit
Vdd	Supply Voltage		7	V
B	Magnetic Flux Density		Unlimited	—
I_{OUT}	Output Current		10	mA
P_D	Power Dissipation	SIP-3L	550	mW
		SC59	230	mW
$T_{J(MAX)}$	Maximum Junction Temperature		+150	°C
T_{ST}	Storage Temperature Range		-65 to +150	°C

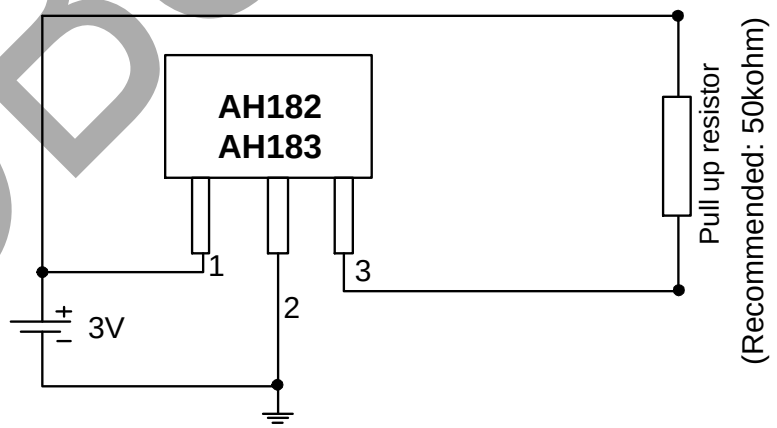
Recommended Operating Conditions (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
Vdd	Supply Voltage	Operating	2.5	5.5	V
T_A	Operating Ambient Temperature	Operating	-40	+85	°C

Electrical Characteristics (@T_A = +25°C, Vdd = 3V, unless otherwise specified.)

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
V_{OUT}	Output On Voltage	I_{OUT} = 1mA	—	0.1	0.3	V
I_{off}	Output Leakage Current	V_{OUT} = 5.5V, B < Brp	—	< 0.1	1	µA
$I_{dd(en)}$	Supply Current	Chip Enable	—	—	2.0	mA
$I_{dd(dis)}$		Chip Disable	—	—	8.0	µA
$I_{dd(avg)}$		AH182: Average Supply Current	—	5	10	µA
$I_{dd(avg)}$		AH183: Average Supply Current	—	280	500	µA
t_{awake}	Awake Time	—	—	50	100	µs
t_{period}	Period	AH182	—	50	100	ms
		AH183	—	200	400	µs
D.C.	Duty Cycle	AH182	—	0.1	—	%
		AH183	—	25	—	%

Test Circuit

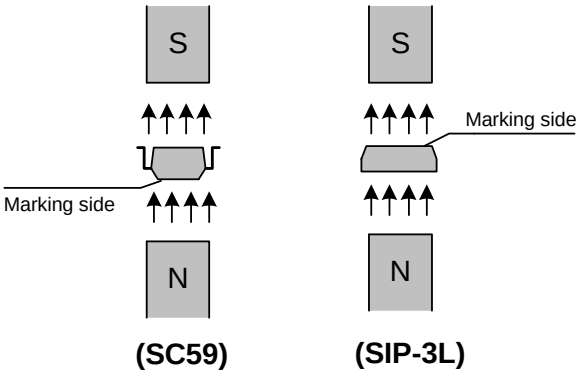


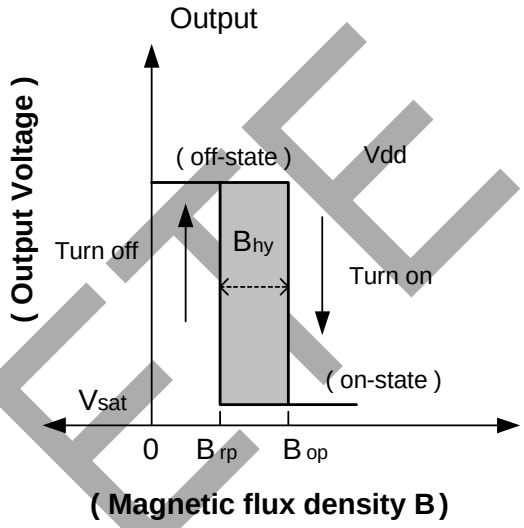
Magnetic Characteristics (@T_A = +25°C, Vdd = 3V) (Note 5)

(1mT = 10 Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
Bops (South Pole To Brand Side)	Operation Point	—	40	60	Gauss
Brps (South Pole To Brand Side)	Release Point	10	30	—	
Bhy ($\lvert Bopx - Brpx \rvert$)	Hysteresis	—	10	—	

Note: 5. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.

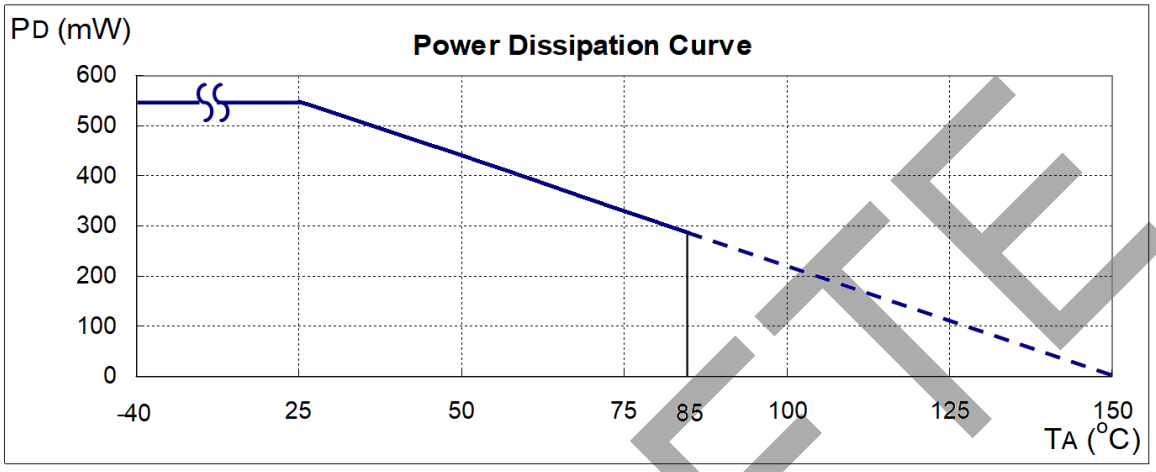




Performance Characteristics

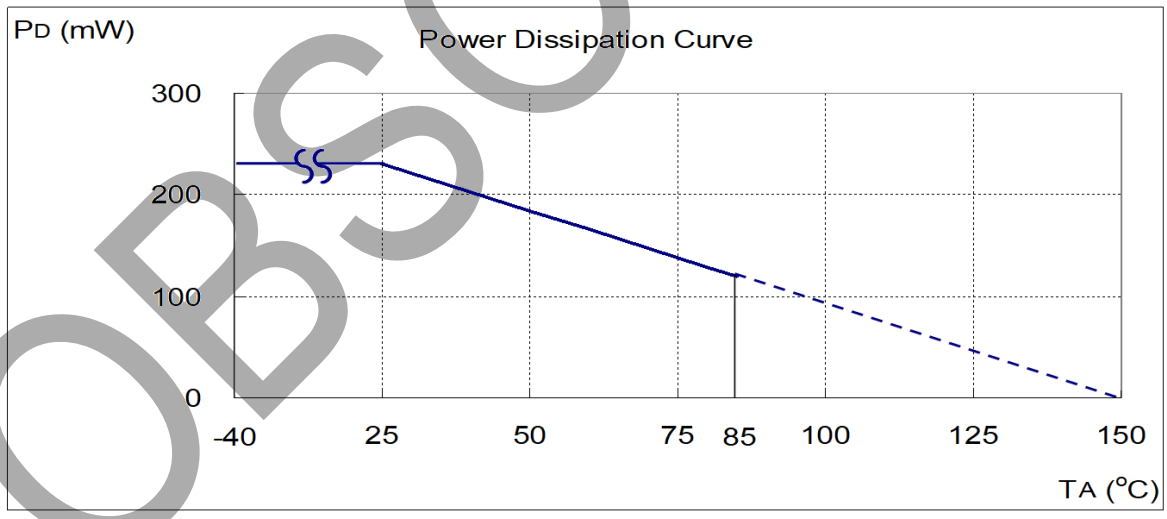
(1) SIP-3L

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

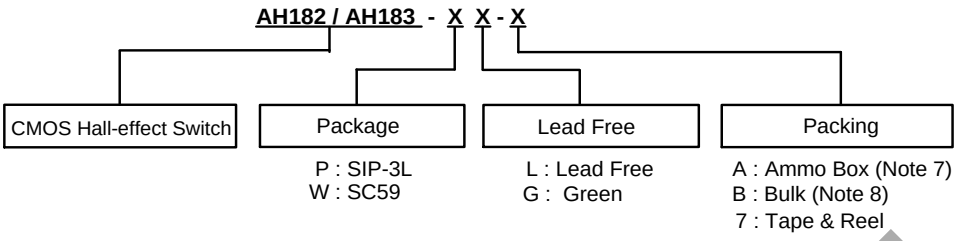


(2) SC59 (Commonly known as SOT23 in Asia)

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

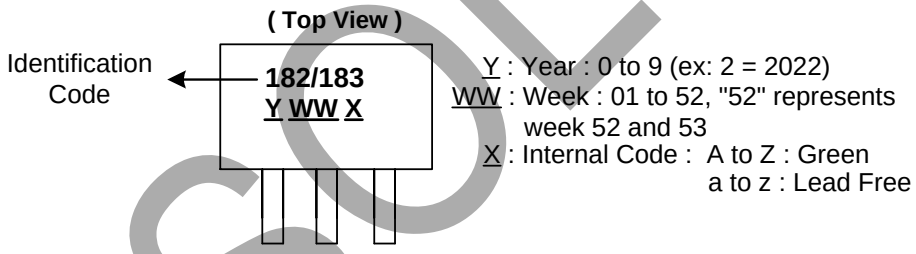


Part Number	Part Number Suffix	Package Code	Package (Note 6)	Packing	
				Qty.	Carrier
AH182/AH183-PL-A	-A	P	SIP-3L	4000	Ammo Box
AH182/AH183-PL-B	-B	P	SIP-3L	1000	Bulk
AH182/AH183-PG-A	-A	P	SIP-3L	4000	Ammo Box
AH182/AH183-PG-B	-B	P	SIP-3L	1000	Bulk
AH182/AH183-WL-7	-7	W	SC59	3000	7" Tape & Reel
AH182/AH183-WG-7	-7	W	SC59	3000	7" Tape & Reel

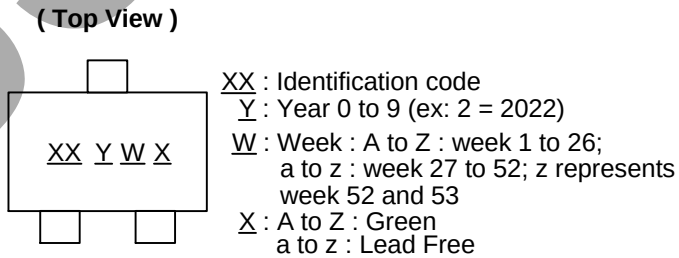
Notes: 6. Pad layout as shown on Diodes Incorporated's suggested pad layout, which can be found on website at http://www.diodes.com/package-outlines.html.
7. Ammo Box is for SIP-3L spread lead.
8. Bulk is for SIP-3L straight lead.

Marking Information

(1) SIP-3L



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

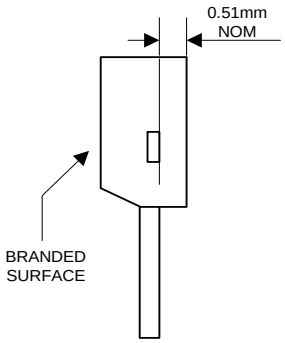


Part Number	Package	Identification Code
AH182-WL-7	SC59	K2
AH182-WG-7	SC59	K2
AH183-WL-7	SC59	K3
AH183-WG-7	SC59	K3

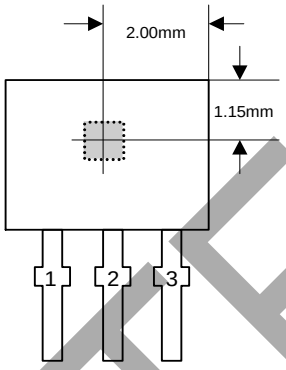
Package Outline Dimensions (All Dimensions in mm)

Please see http://www.diodes.com/package-outlines.html for the latest version.

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

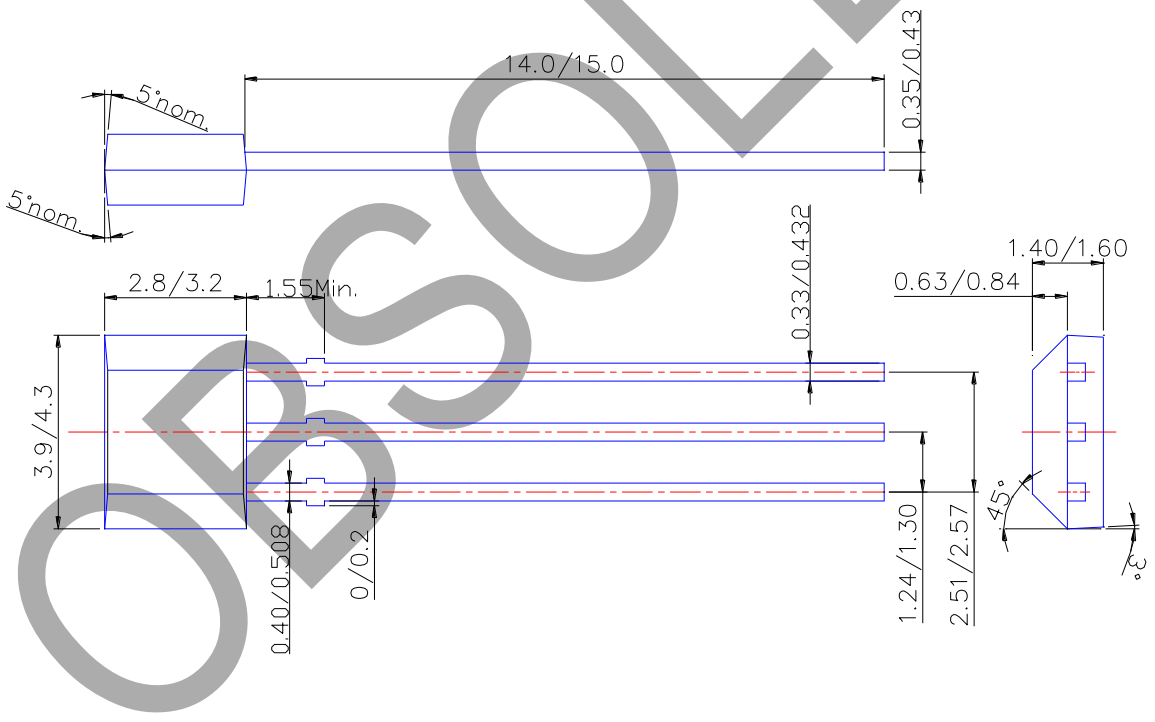


Active Area Depth



Sensor Location

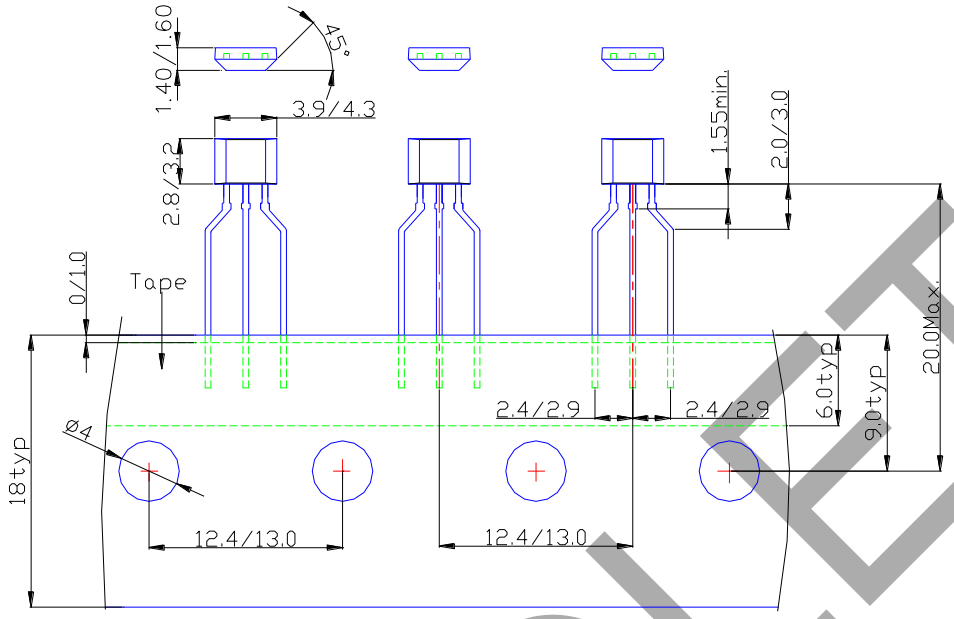
Package Dimensions



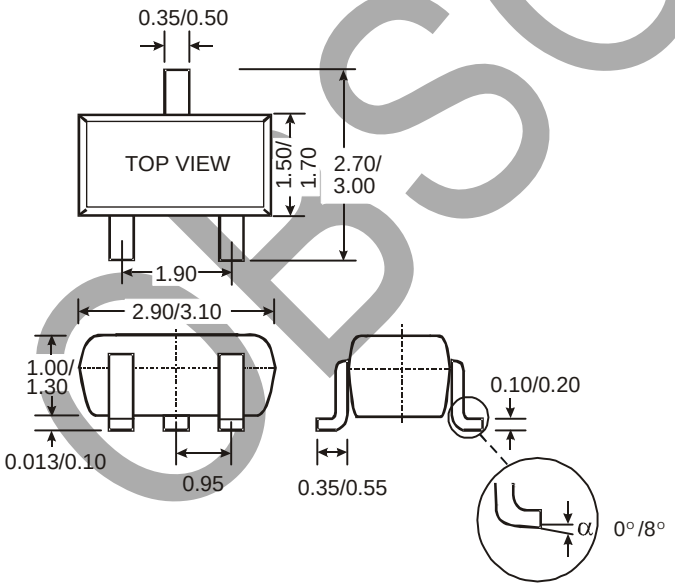
Package Outline Dimensions (All Dimensions in mm) (continued)

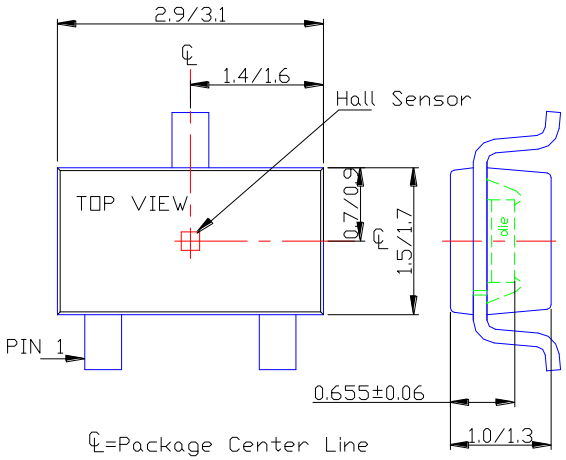
Please see http://www.diodes.com/package-outlines.html for the latest version.

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



(3) Package Type: SC59 (commonly known as SOT23 in Asia)





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