

### Features

- Micropower operation
- Operation with magnetic field of either north or south pole (omnipolar)
- 2.5V to 5.5V battery operation
- Chopper stabilized
- Superior temperature stability
- Good RF noise immunity
- -40°C to 85°C operating temperature
- SIP-3L/SC59-3L/Low profile DFN2020-6 package
- ESD (HBM) > 5KV for DFN2020-6  
> 6KV for SIP-3L and SC59-3L
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)
- Green Packages: SC59-3L, DFN2020-6
- Lead Free Package: SIP-3L

### General Description

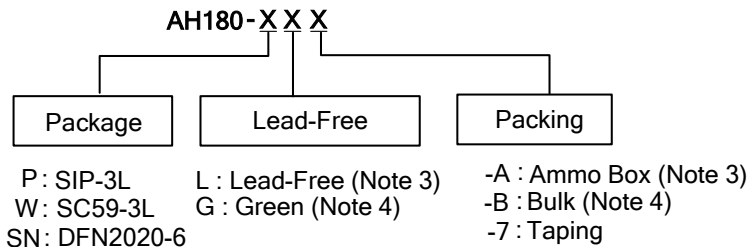
AH180 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24µW with a 3V power source.

Either north or south pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field. While the magnetic flux density (**B**) is larger than operating point (**Bop**), the output will be turned on (low), the output is held until **B** is lower than release point (**Brp**), then turned off.

### Applications

- Cover switch in clam-shell cellular phones
- Cover switch in Notebook PC/PDA
- Contact-less switch in consumer products °C

### Ordering Information



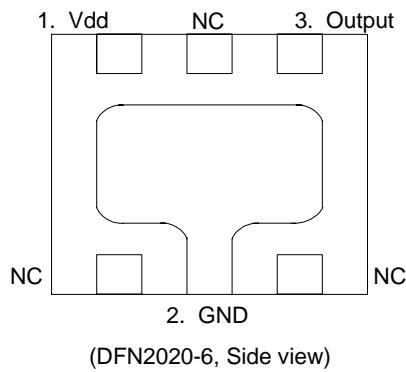
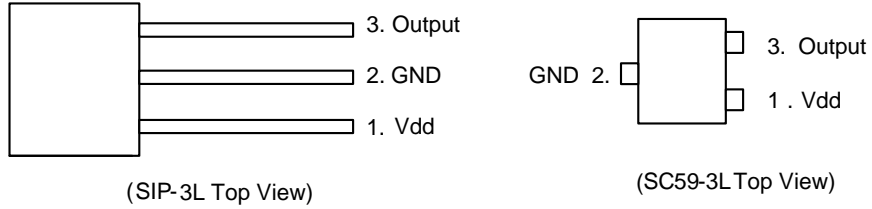
Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

	Package Code	Packaging (Note 2)	Tube/Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH180-P	P	SIP-3L	1000	-B	NA	NA	4000/Box	-A
AH180-W	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA
AH180-SN	SN	DFN2020-6	NA	NA	3000/Tape & Reel	-7	NA	NA

Note: 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. Lead Free is only for SIP-3L.
4. Green is only for SC59 and DFN2020.
5. Ammo Box is for SIP-3L Spread Lead.
6. Bulk is for SIP-3L Straight Lead.

**Pin Assignment**

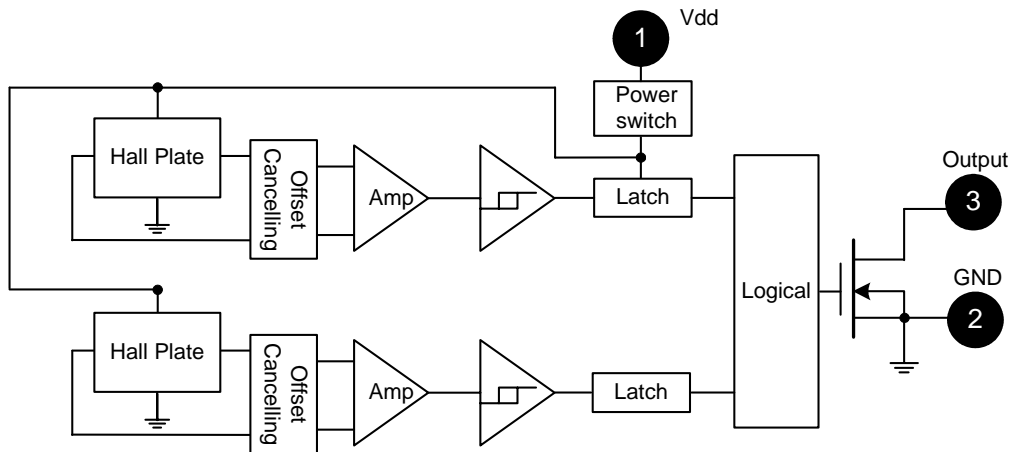


Note: 7. NC is "No Connection" which is recommended to be tied to ground.

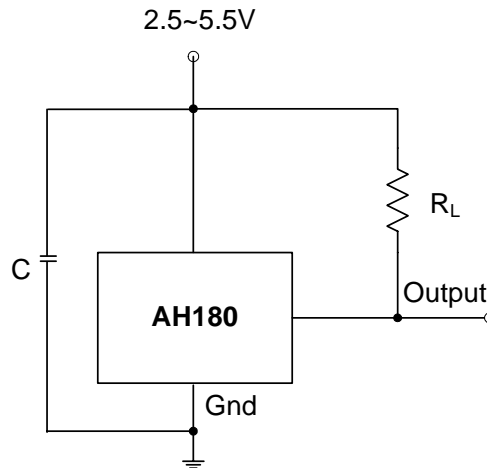
**Pin Assignment**

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

**Block Diagram**



## Typical Circuit



Note: 8. C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.

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

Characteristics	Symbol	Values	Unit
Supply voltage	Vdd	7	V
Magnetic flux density	B	Unlimited	
Operating Temperature Range	$T_A$	-40 to +85	$^\circ\text{C}$
Storage Temperature Range	$T_s$	-65 to +150	$^\circ\text{C}$
Package Power Dissipation	PD	SIP-3L	550 mW
		SC59-3L/DFN2020-6	230 mW
Maximum Junction Temp	$T_{mj}$	150	$^\circ\text{C}$

## Recommended Operating Conditions ( $T_A = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Rating	Unit
Supply Voltage	Vdd	Operating	2.5~5.5	V

**Electrical Characteristics** (  $T_A = +25^\circ\text{C}$ ,  $V_{dd} = 3\text{V}$ ; unless otherwise specified)

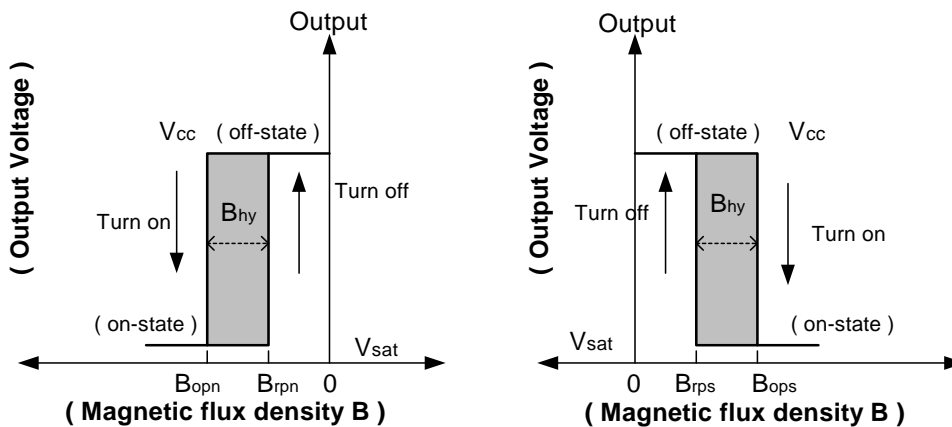
Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Output On Voltage	$V_{out}$	$I_{out}=1\text{mA}$	—	0.1	0.3	V
Output Leakage Current	$I_{off}$	$V_{out}=5.5\text{V}$ , $B < B_{rp}$	—	<0.1	1	$\mu\text{A}$
Supply Current	$I_{dd(en)}$	Chip enable	—	3	6	$\text{mA}$
	$I_{dd(dis)}$	Chip disable	—	5	10	$\mu\text{A}$
	$I_{dd(ave)}$	Average supply current	—	8	16	$\mu\text{A}$
Awake Time	$T_{awake}$		—	75	125	$\mu\text{s}$
Period	$T_{period}$		—	75	125	ms
Duty Cycle	D.C.		—	0.1	—	%

**Magnetic Characteristics** ( $T_A=25^\circ\text{C}$ ,  $V_{dd}=3\text{V}$ )

(1mT=10 Gauss)

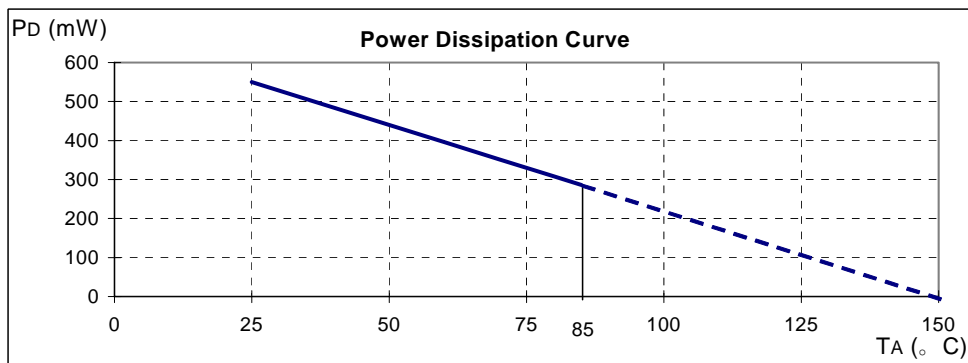
Characteristic	Symbol	Min	Typ	Max	Unit
Operate Point	$B_{ops}$ (south pole to brand side)	-	40	60	Gauss
	$B_{opn}$ (north pole to brand side)	-60	-40	-	
Release Point	$B_{rps}$ (south pole to brand side)	10	30	-	
	$B_{rpn}$ (north pole to brand side)	-	-30	-10	
Hysteresis	$B_{hy}( B_{opx} - B_{rpx} )$	-	15	-	

- Notes: 9. Typical data is at  $T_a = 25^\circ\text{C}$ ,  $V_{dd} = 3\text{V}$ , and for design information only.  
10. Operating point and release point will vary with supply voltage and operating temperature.



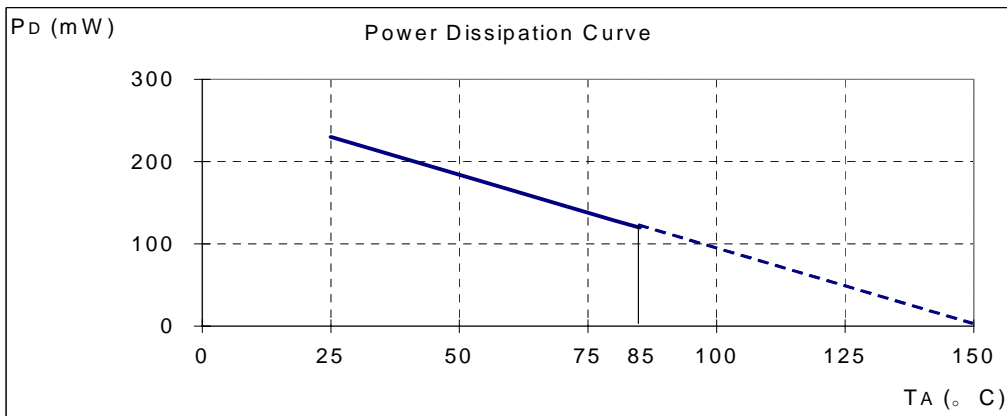
**Performance Characteristics (SIP-3L)**

<b>TA (°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>
PD (mW)	550	440	396	352	308	286	264	242	220
<b>TA (°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>
PD (mW)	198	176	154	132	110	88	66	44	0



**Performance Characteristics (SC59-3L/DFN2020-6)**

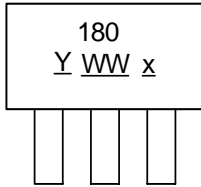
<b>TA (°C)</b>	<b>25</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>100</b>	<b>110</b>	<b>120</b>	<b>130</b>	<b>140</b>	<b>150</b>
PD (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



**Marking Information**

**(1) SIP-3L**

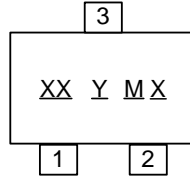
(Top View)



Y : Year: "01"= 2001  
"02"= 2002  
WW : Nth Week 01~52  
X : Internal code a~z: Lead Free

**(2) SC59-3L**

(Top View)

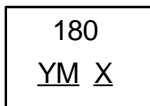


XX : K0: AH180  
Y : Year 0~9  
M : Month A~L  
X : Internal code  
A~Z: Green

Part Number	Package	Identification Code
AH180	SC59	K0

**(3) DFN2020-6**

(Top View)

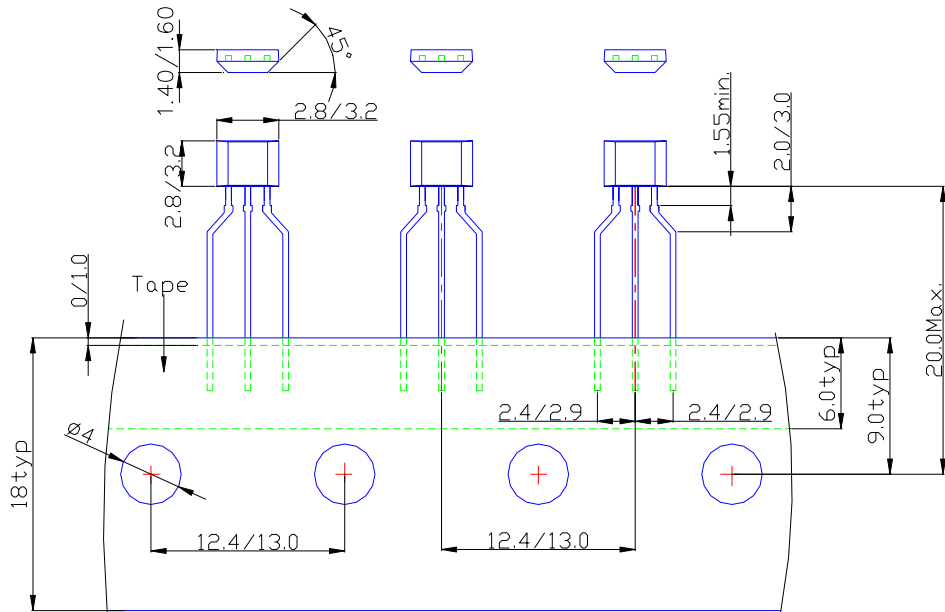


X : Internal code  
A~Z: Green  
Y : Year 0~9  
M : Month A~L



**Package Information** (Continued)

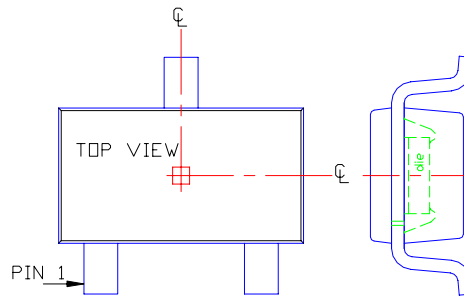
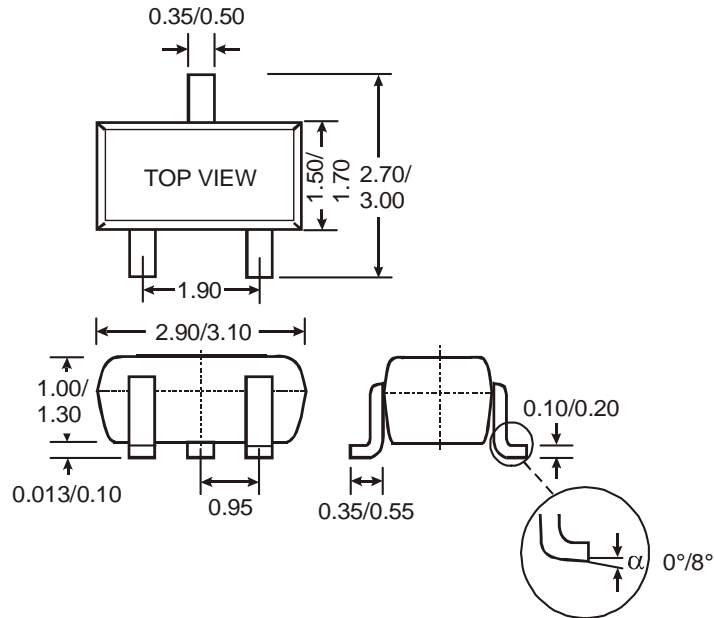
(2) SIP-3L for Ammo pack





**Package Information** (Continued)

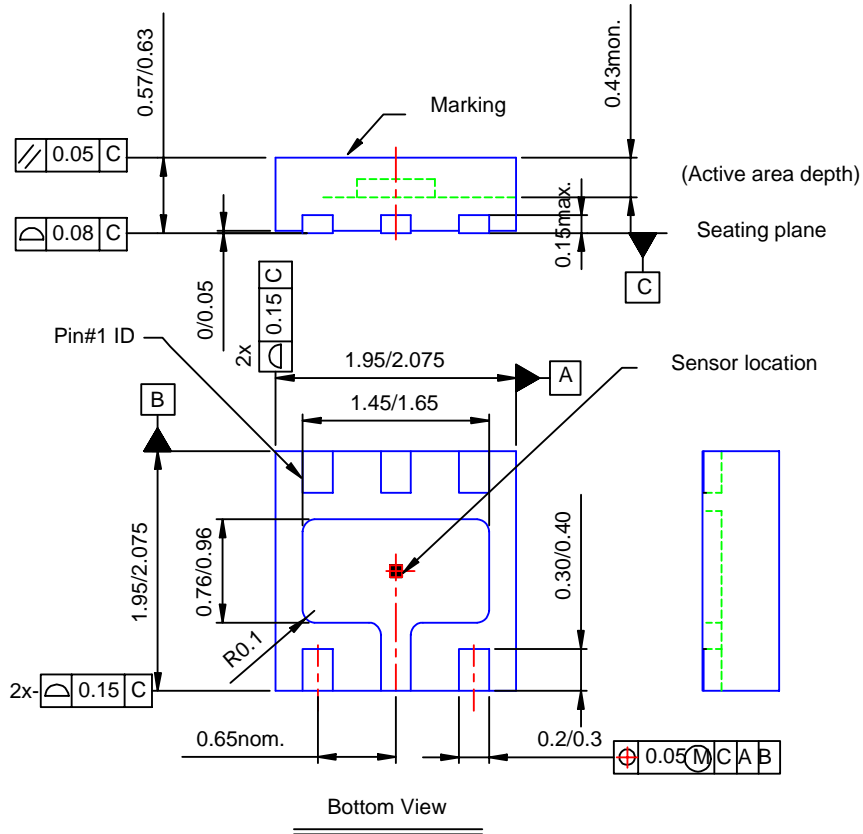
(3) SC59-3L



**Sensor Location**

**Package Information** (Continued)

(4) DFN2020-6



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