

### 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
  - Extremely Low Switch-Point Drift
  - Insensitive to Physical Stress
- Good RF noise immunity
- -40°C to 85°C operating temperature
- SIP-3L/SC59/Low profile DFN2020-6, DFN2020-3 package
- ESD (HBM) > 5KV for DFN2020-6, DFN2020-3  
> 6KV for SIP-3L and SC59
- Lead Free Package: SIP-3L (Note 1)
- SC59 (commonly known as SOT23 in Asia) and DFN2020-6, DFN2020-3: Available in "Green" Molding Compound (No Br, Sb) (Note 2)
- Lead Free Finish/RoHS Compliant (Note 3)

### General Description

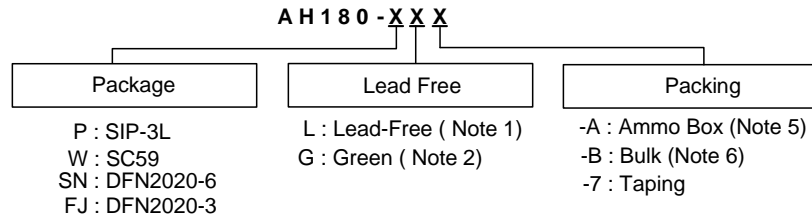
AH180 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24μW with a 3V power source.

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

### Ordering Information



- Note: 1. SIP-3L is available in "Lead Free" product only.  
 2. SC59, DFN2020-6 and DFN2020-3 are available in "Green" product only.  
 3. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

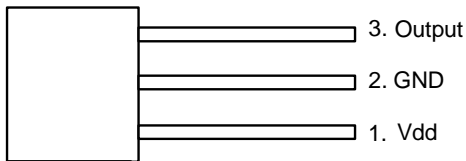
Device	Package Code	Packaging (Note 4)	Tube/Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH180-P	P	SIP-3L	1000	-B	NA	NA	4000/Box	-A
AH180-W	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA
AH180-SN	SN	DFN2020-6	NA	NA	3000/Tape & Reel	-7	NA	NA
AH180-FJ	FJ	DFN2020-3	NA	NA	3000/Tape & Reel	-7	NA	NA

- Note: 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. Ammo Box is for SIP-3L Spread Lead.  
 6. Bulk is for SIP-3L Straight Lead.

## Pin Assignment

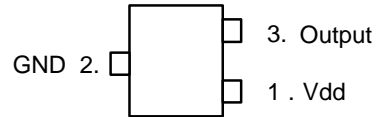
(1) SIP-3L

( Top View )



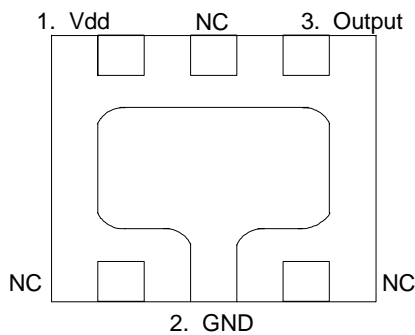
(2) SC59

( Top View )



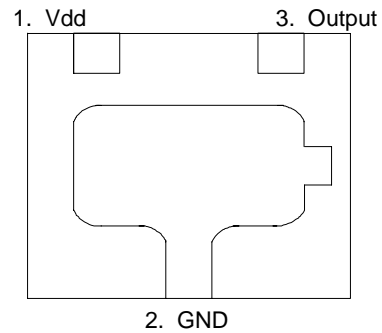
(3) DFN2020-6

( Bottom view )



(4) DFN2020-3

( Bottom view )

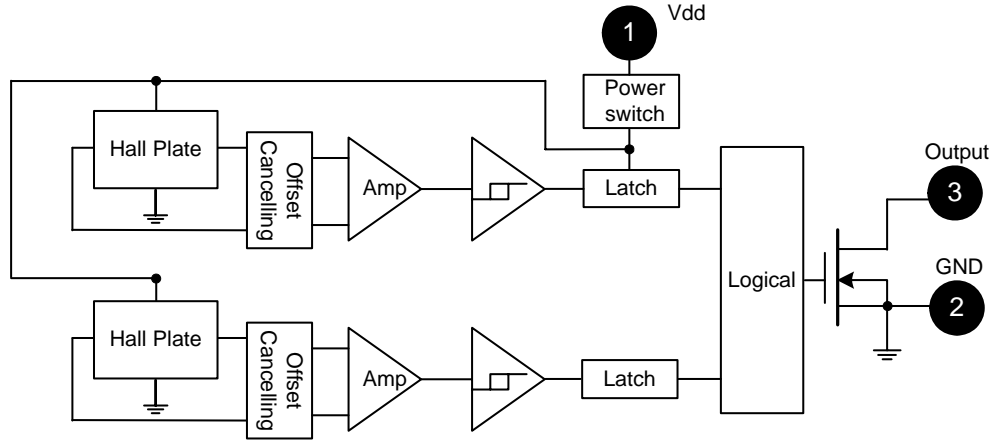


Note: 7. NC is "No Connection" which is recommended to be tied to ground.

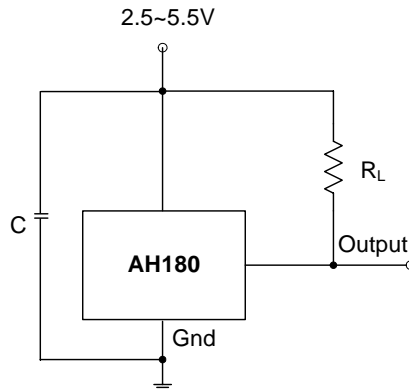
## Pin Descriptions

Name	P/I/O	Pin #	Description
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 TA= 25°C)

Symbol	Characteristics	Values	Unit	
Vdd	Supply voltage	7	V	
B	Magnetic flux density	Unlimited		
TA	Operating Temperature Range	-40 to +85	°C	
TS	Storage Temperature Range	-65 to +150	°C	
Pd	Package Power Dissipation	SIP-3L	550	mW
		SC59-3L / DFN2020-6 / DFN2020-3	230	mW
TJ	Maximum Junction Temperature	150	°C	

**Recommended Operating Conditions** (TA = 25°C)

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

**Electrical Characteristics** (TA = +25°C, Vdd = 3V; unless otherwise specified)

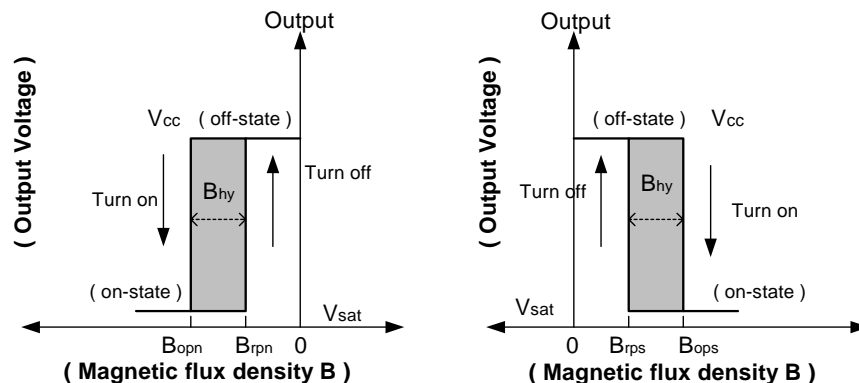
Symbol	Characteristic	Conditions	Min	Typ	Max	Unit
Vout	Output On Voltage	Iout = 1mA	—	0.1	0.3	V
Ioff	Output Leakage Current	Vout = 5.5V, Output off	—	<0.1	1	μA
Idd(en)	Supply Current	Chip enable, TA = 25°C, Vdd = 3V	—	3	6	mA
Idd(en)		Chip enable, TA = -40~85°C, Vdd = 2.5~5.5V	—	3	9	mA
Idd(dis)		Chip disable, TA = 25°C, Vdd = 3V	—	5	10	μA
Idd(dis)		Chip disable, TA = -40~85°C, Vdd = 2.5~5.5V	—	5	15	μA
Idd(avg)		Average supply current, TA = 25°C, Vdd = 3V	—	8	16	μA
Idd(avg)		Average supply current, TA = -40~85°C, Vdd = 2.5~5.5V	—	8	24	μA
Tawake	Awake Time		—	75	125	μs
Tperiod	Period		—	75	125	ms
D.C.	Duty Cycle		—	0.1	—	%

**Magnetic Characteristics** (TA = 25°C, Vdd = 3V, Note 9,10)

(1mT=10 Gauss)

Symbol	Characteristic	Min	Typ	Max	Unit
Bops(south pole to brand side)	Operate Point	-	40	60	Gauss
Bopn(north pole to brand side)		-60	-40	-	
Brps(south pole to brand side)	Release Point	10	30	-	
Brpn(north pole to brand side)		-	-30	-10	
Bhy( Bopx - Brpx )	Hysteresis	-	15	-	

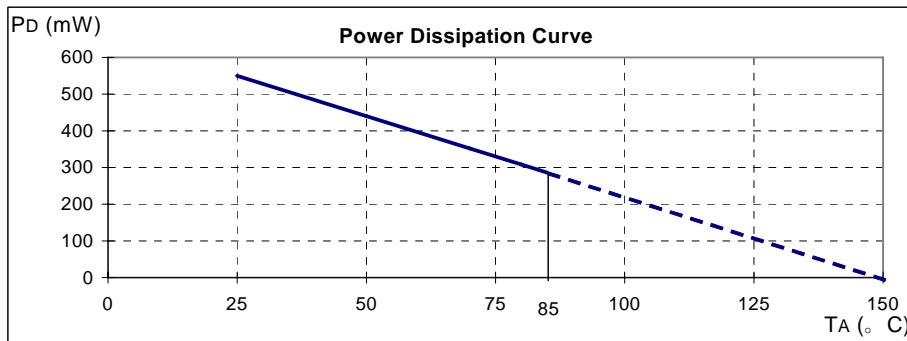
- Notes: 9. Typical data is at Ta = 25°C, Vdd = 3V, and for design information only.  
10. Operating point and release point will vary with supply voltage and operating temperature.



**Performance Characteristics**

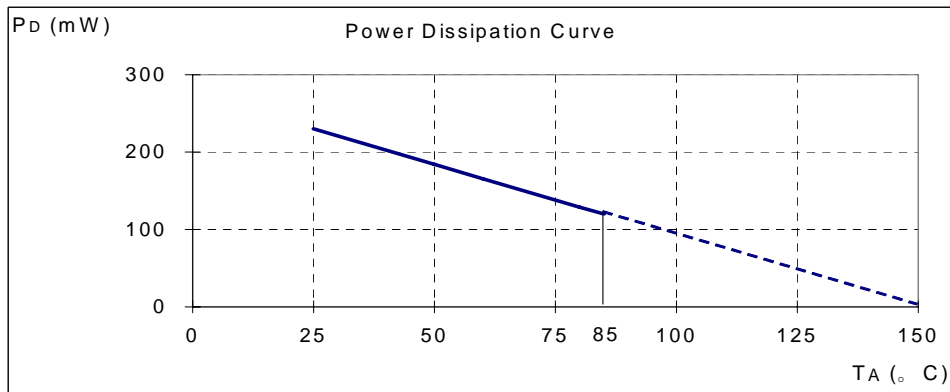
**(1) SIP-3L**

<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>
P <sub>D</sub> (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>
P <sub>D</sub> (mW)	198	176	154	132	110	88	66	44	0



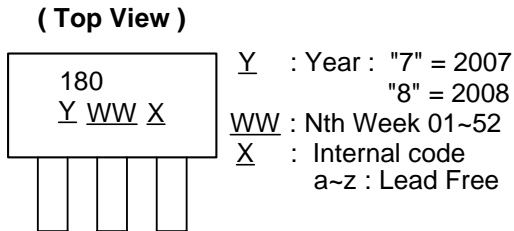
**(2) SC59, DFN2020-6 and DFN2020-3**

<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>
P <sub>D</sub> (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0

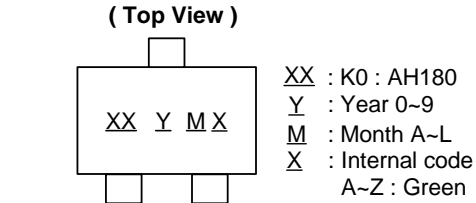


**Marking Information**

(1) SIP-3L

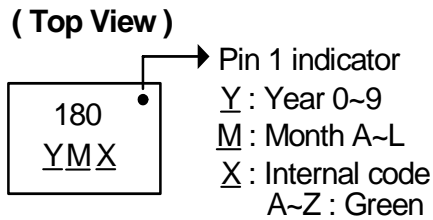


(2) SC59

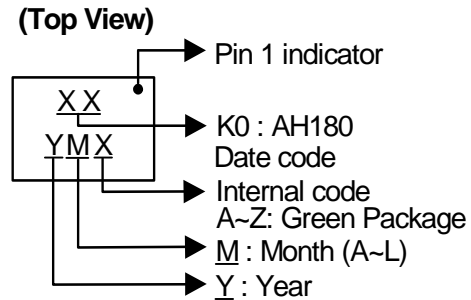


Part Number	Package	Identification Code
AH180	SC59	K0

(3) DFN2020-6



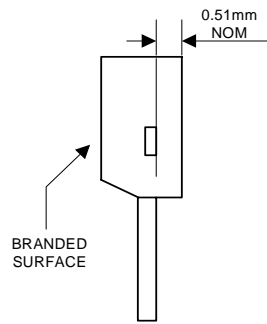
(4) DFN2020-3



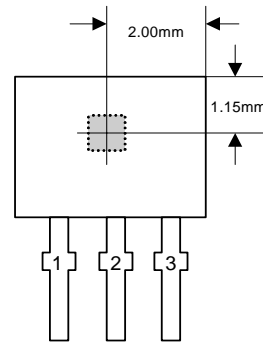
Part Number	Package	Identification Code
AH180	DFN2020-3	K0

**Package Information** (unit: mm)

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

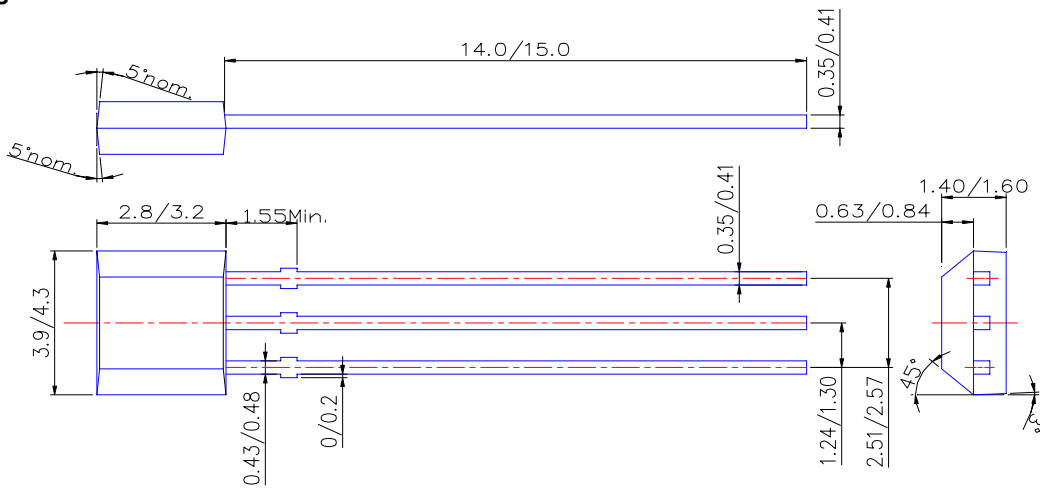


Active Area Depth



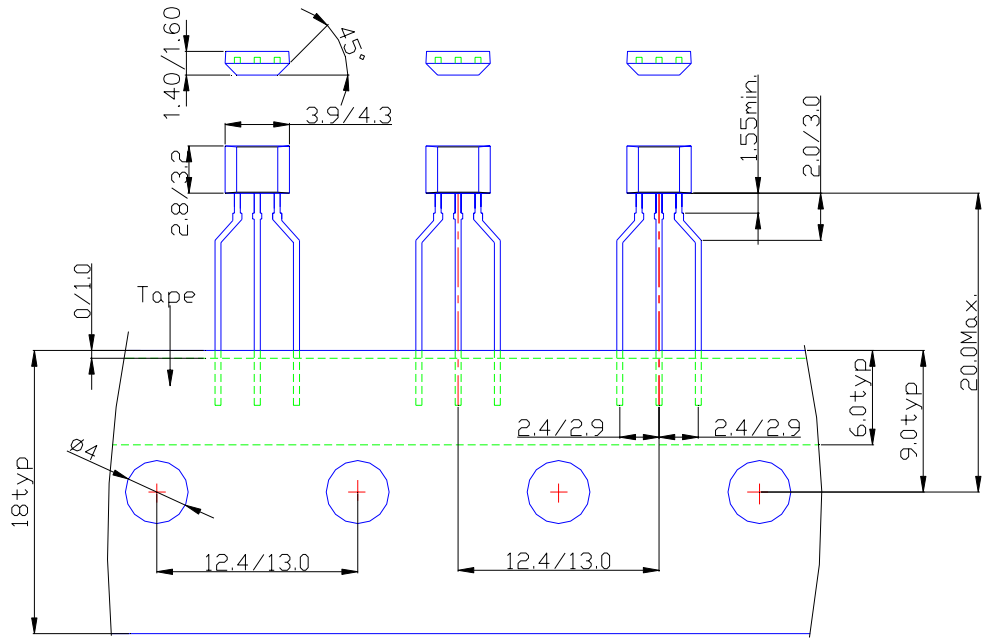
Sensor Location

**Package Dimension**

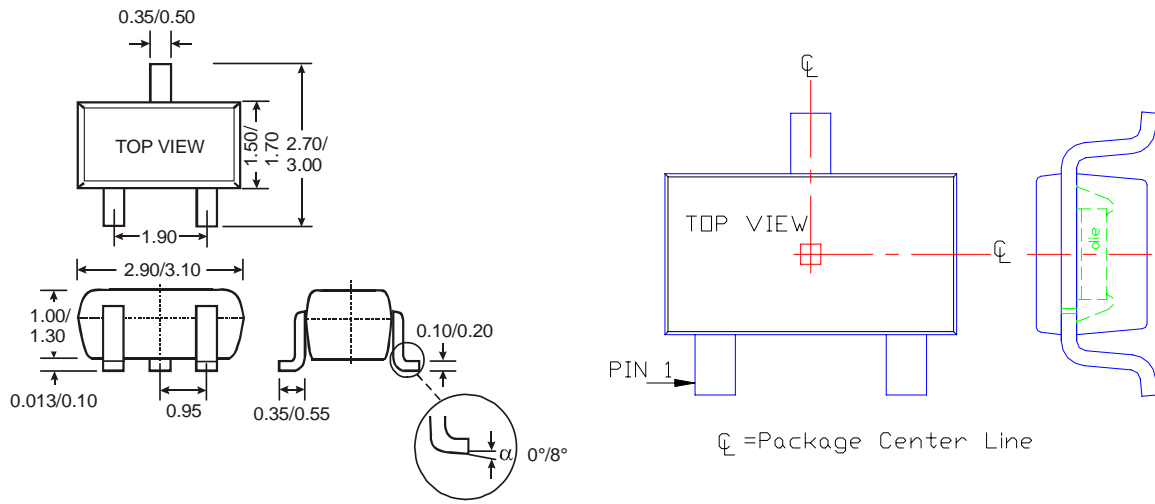


**Package Information (Continued)**

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



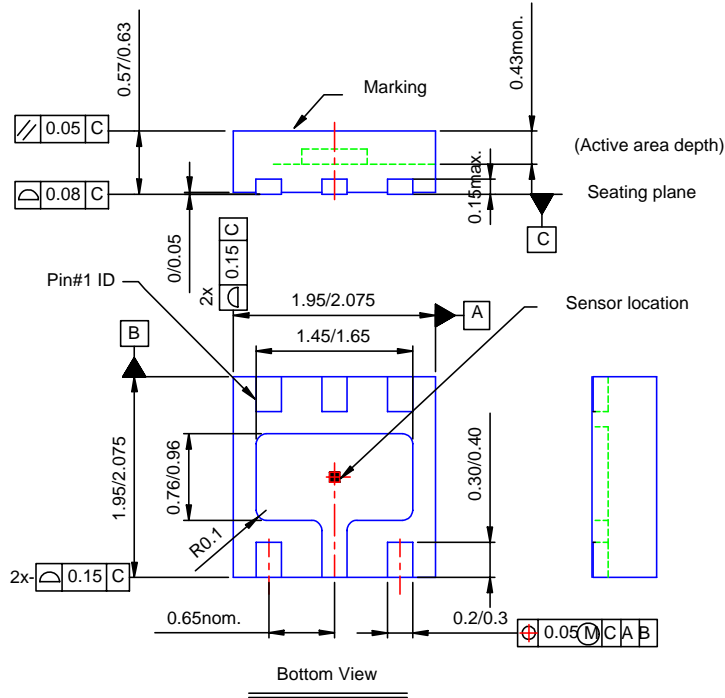
**(3) SC59 (commonly known as SOT23 in Asia)**



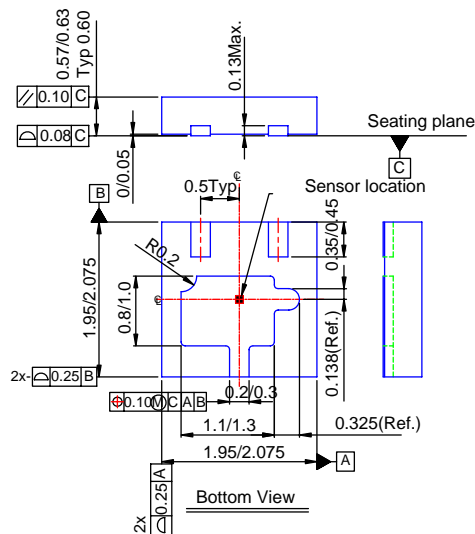


**Package Information** (Continued)

(4) DFN2020-6



(5) DFN2020-3



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