AH180

MICROPOWER OMNIPOLAR HALL-EFFECT SENSOR SWITCH

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

Pin Description

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

Ordering Information

AH180 - X X X

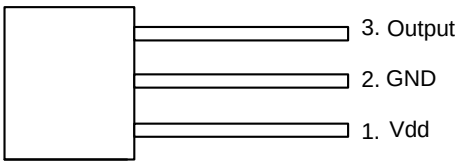
Package	Lead	Packing
P: SIP-3L	L: Lead-Free (Note 3)	-A: Ammo Box (Note 5)
W: SC59-3L	G: Green (Note 4)	-B: Bulk (Note 6)
SN: DFN2020		-7: Taping

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

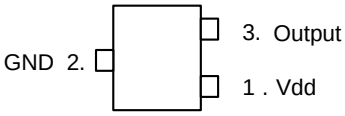
	Package Code	Packaging (Note 2)	Tube/Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH180-P	P	SIP-3L	1000	-B	NA	NA	4000/Box	-A
AH180-W	W	SC59-3L	NA	NA	3000/Tape & Reel	-7	NA	NA
AH180-SN	SN	DFN2020-6	NA	NA	3000/Tape & Reel	-7	NA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

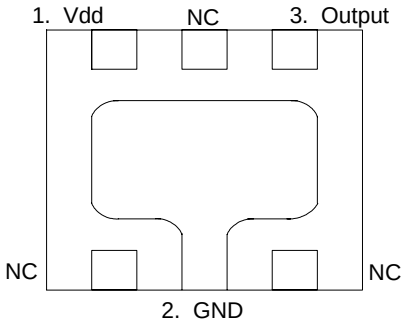
Pin Assignment



(SIP-3L Top View)



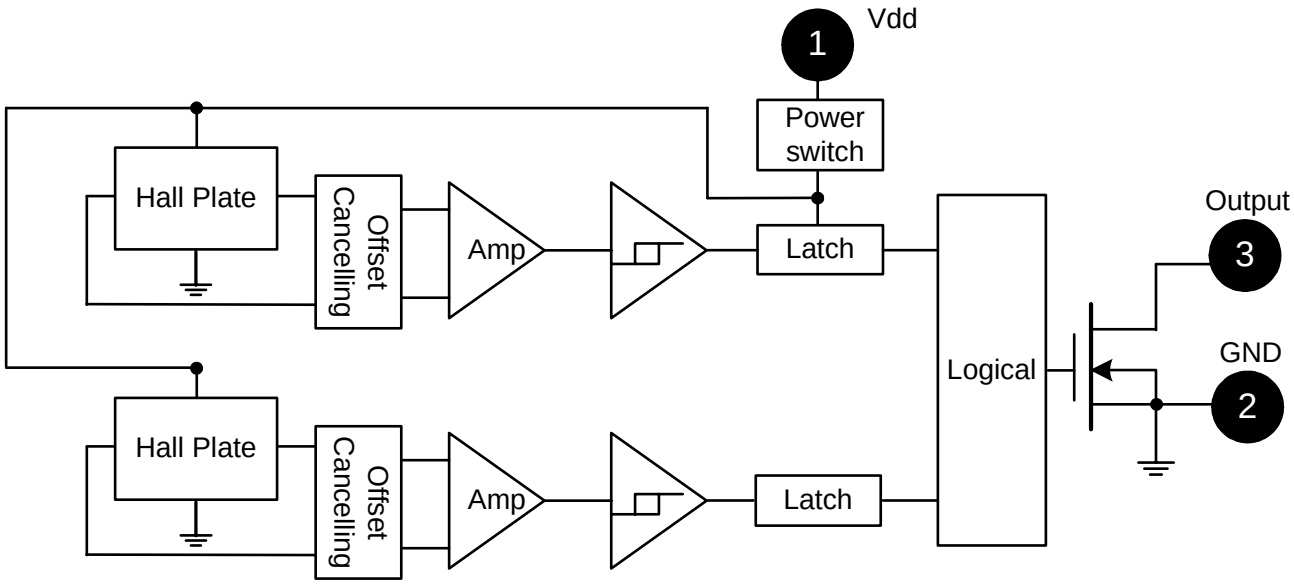
(SC59-3L Top View)



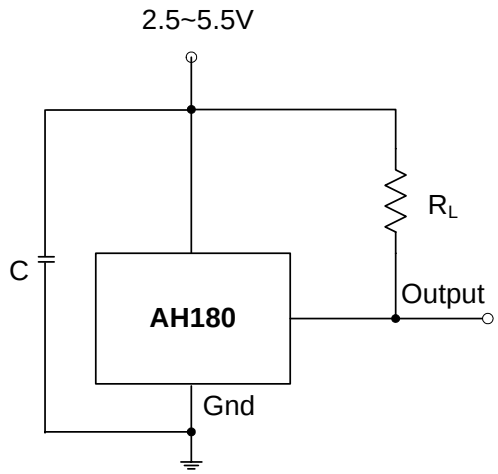
(DFN2020-6, Side view)

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

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°C)

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

Recommended Operating Conditions (T_A = 25°C)

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

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

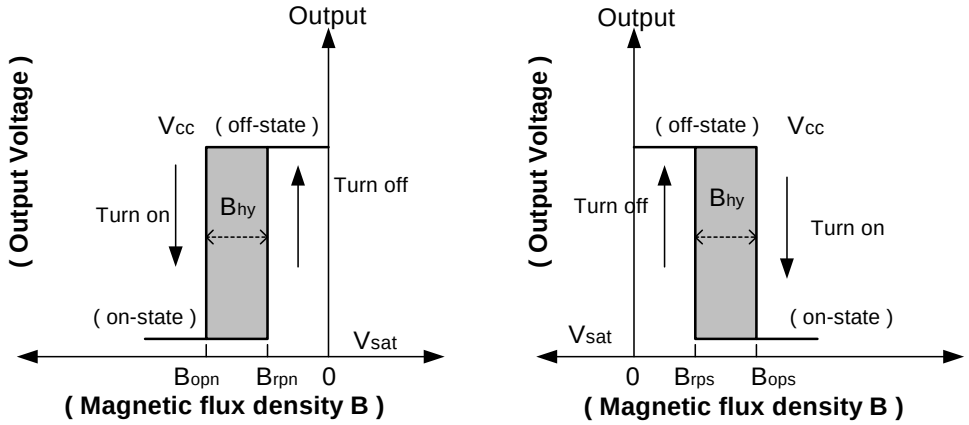
Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Output On Voltage	Vout	Iout=1mA	—	0.1	0.3	V
Output Leakage Current	Ioff	Vout=5.5V, B < Brp	—	<0.1	1	μA
Supply Current	Idd(en)	Chip enable	—	3	6	mA
	Idd(dis)	Chip disable	—	5	10	μA
	Idd(avg)	Average supply current	—	8	16	μA
Awake Time	Tawake		—	75	125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

Magnetic Characteristics (T_A=25°C, Vdd=3V)

(1mT=10 Gauss)

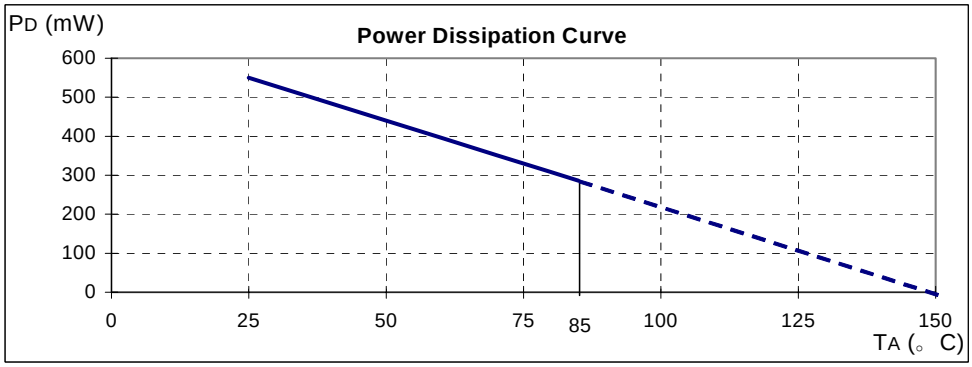
Characteristic	Symbol	Min	Typ	Max	Unit
Operate Point	Bops(south pole to brand side)	-	40	60	Gauss
	Bopn(north pole to brand side)	-60	-40	-	
Release Point	Brps(south pole to brand side)	10	30	-	
	Brpn(north pole to brand side)	-	-30	-10	
Hysteresis	Bhy(|Bopx − Brpx|)	-	15	-	

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.



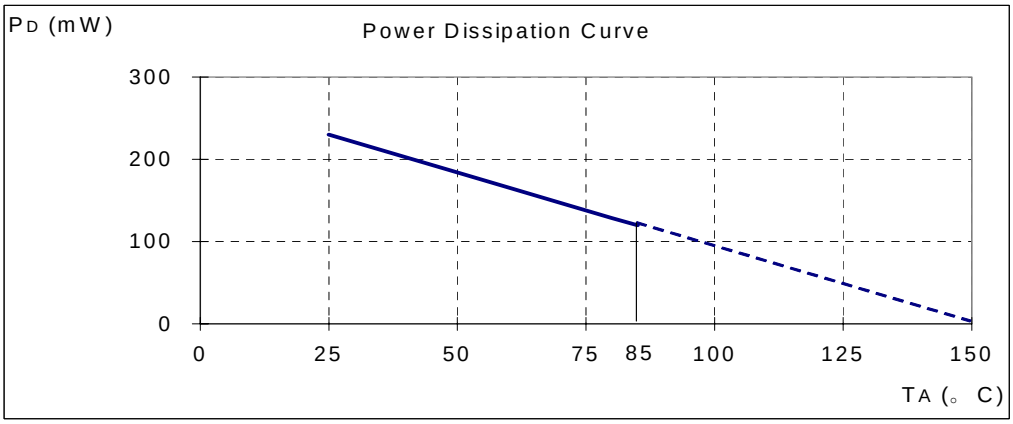
Performance Characteristics (SIP-3L)

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



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

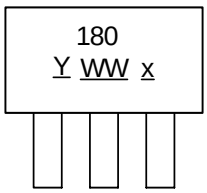
T_A (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P_D (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



Marking Information

(1) SIP-3L

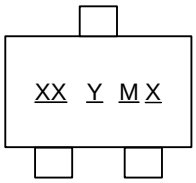
(Top View)



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

(2) SC59

(Top View)

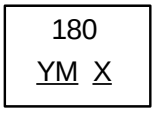


XX : K0: AH180
Y : Year 0~9
M : Month A~L
X : Internal code
A~Z: Green

Part Number	Package	Identification Code
AH180	SC59	K0

(3) DFN2020

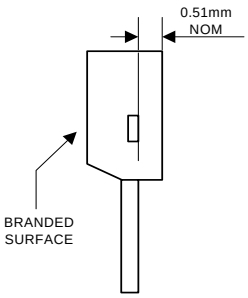
(Top View)



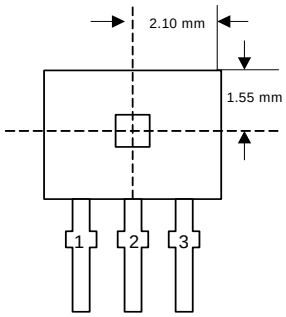
X : Internal code
A~Z: Green
Y : Year 0~9
M : Month A~L

Package Information (unit: mm)

(1) SIP-3L

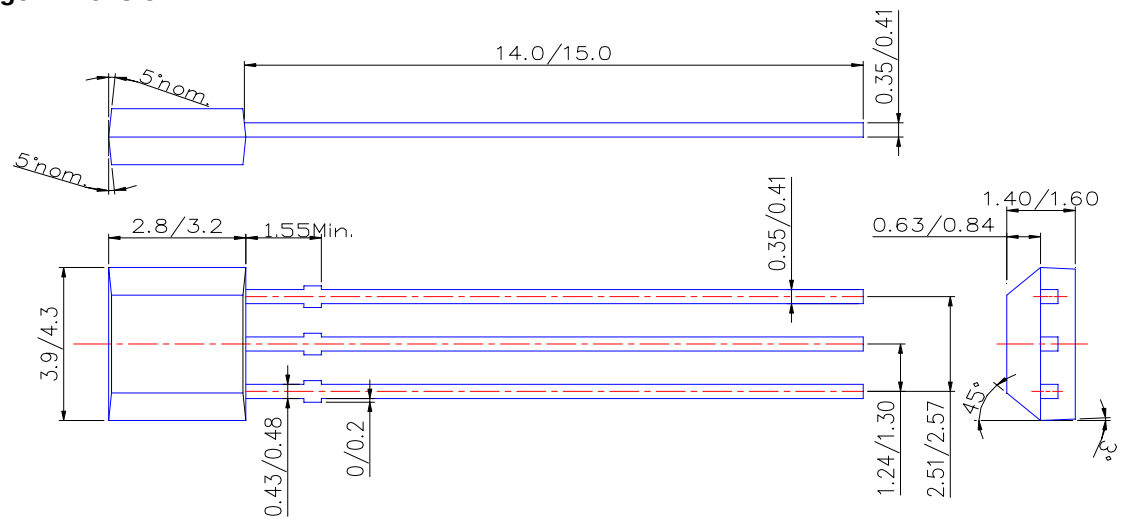


Active Area Depth



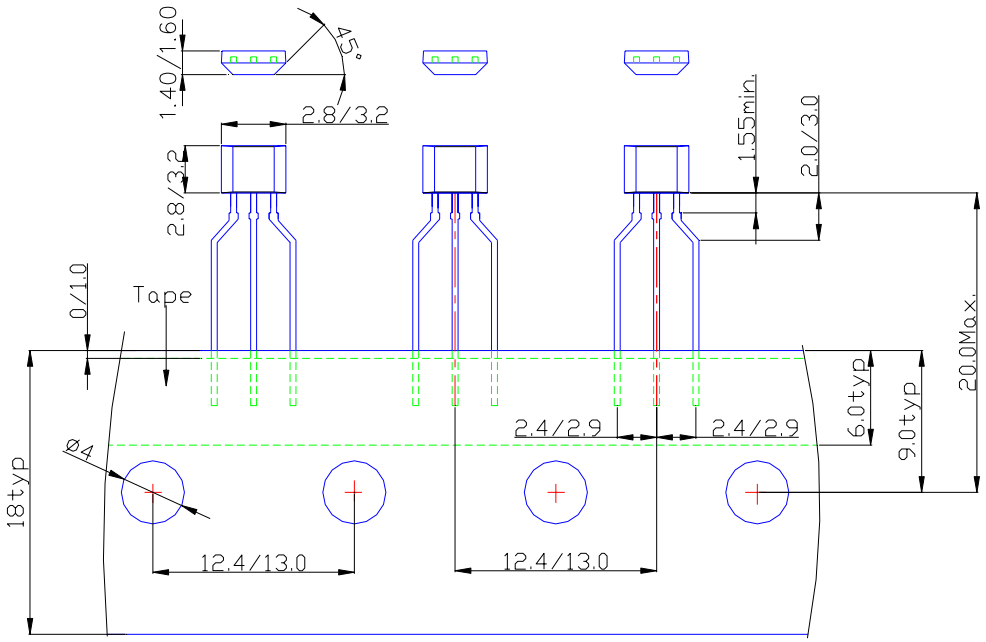
Sensor Location

Package Dimension

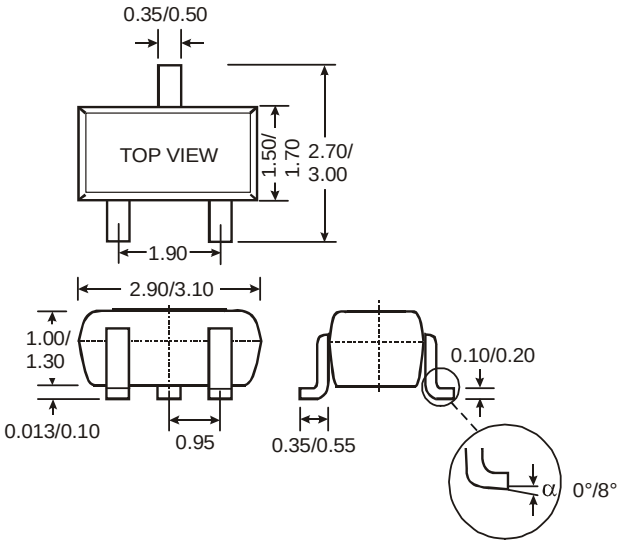


Package Information (Continued)

(2) SIP-3L for Ammo Pack-only



(3) SC59-3L



Package Information (Continued)

(4) DFN2020-6