AH1802

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

General Description

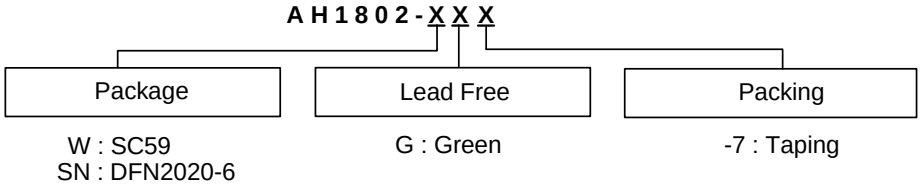
AH1802 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24 W with a 3V power source.

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

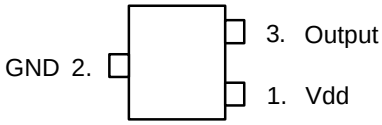
Device	Package Code	Packaging (Note 2)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1802-W	W	SC59	3000/Tape & Reel	-7
AH1802-SN	SN	DFN2020-6	3000/Tape & Reel	-7

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.

Pin Assignment

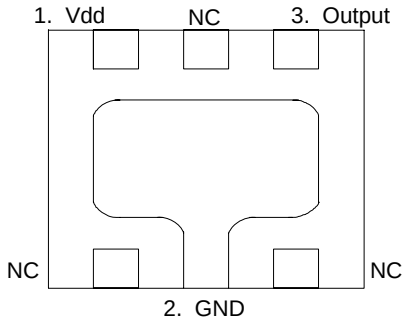
(1) SC59

(Top View)



(2) DFN2020-6

(Bottom view)

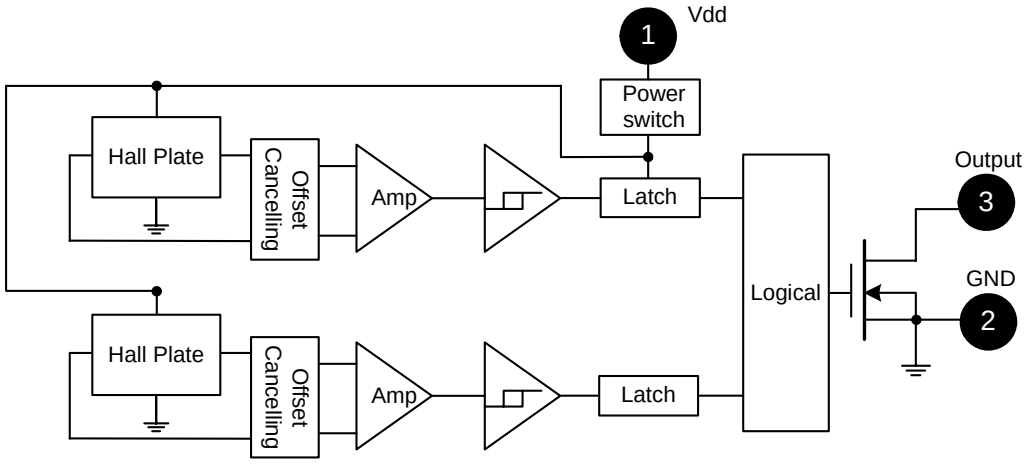


Note: 3. NC is "No Connection" which is recommended to be tied to ground.

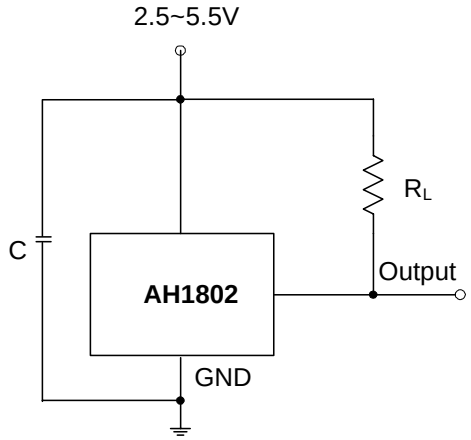
Pin Descriptions

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: 4. 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)

Symbol	Characteristics		Values	Unit
Vdd	Supply voltage		7	V
B	Magnetic flux density		Unlimited	
T_A	Operating Temperature Range		-40 to +85	°C
T_S	Storage Temperature Range		-65 to +150	°C
P_D	Package Power Dissipation	SC59	230	mW
		DFN2020-6		
T_J	Maximum Junction Temperature		150	°C

Recommended Operating Conditions (T_A = 25°C)

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

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

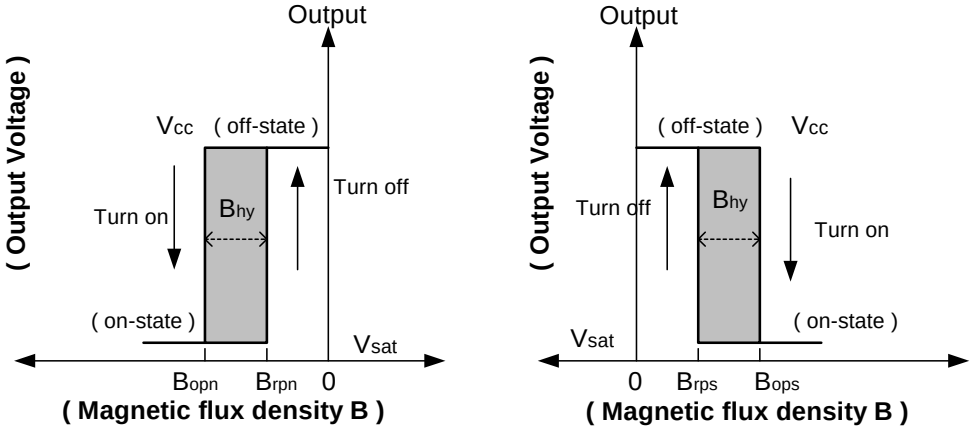
Symbol	Characteristic	Conditions	Min	Typ	Max	Unit
Vout	Output On Voltage	Iout = 1mA	-	0.1	0.3	V
Ioff	Output Leakage Current	Vout = 5.5V, Output off	-	<0.1	1	µA
Idd(en)	Supply Current	Chip enable, T_A = 25°C, Vdd = 3V	-	3	6	mA
		Chip enable, T_A = -40~85°C, Vdd = 2.5~5.5V	-	3	9	mA
Idd(dis)		Chip disable, T_A = 25°C, Vdd = 3V	-	5	10	µA
		Chip disable, T_A = -40~85°C, Vdd = 2.5~5.5V	-	5	14	µA
Idd(avg)		Average supply current, T_A = 25°C, Vdd = 3V	-	8	16	µA
		Average supply current, T_A = -40~85°C, Vdd = 2.5~5.5V	-	8	23	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 5,6)

(1mT=10 Gauss)

Symbol	Characteristic	Min	Typ	Max	Unit
Bops(south pole to brand side)	Operate Point	20	28	40	Gauss
Bopn(north pole to brand side)		-40	-28	-20	
Brps(south pole to brand side)	Release Point	10	20	-	
Brpn(north pole to brand side)		-	-20	-10	
Bhy($\lvert Bopx - Brpx \rvert$)	Hysteresis	5	8	-	

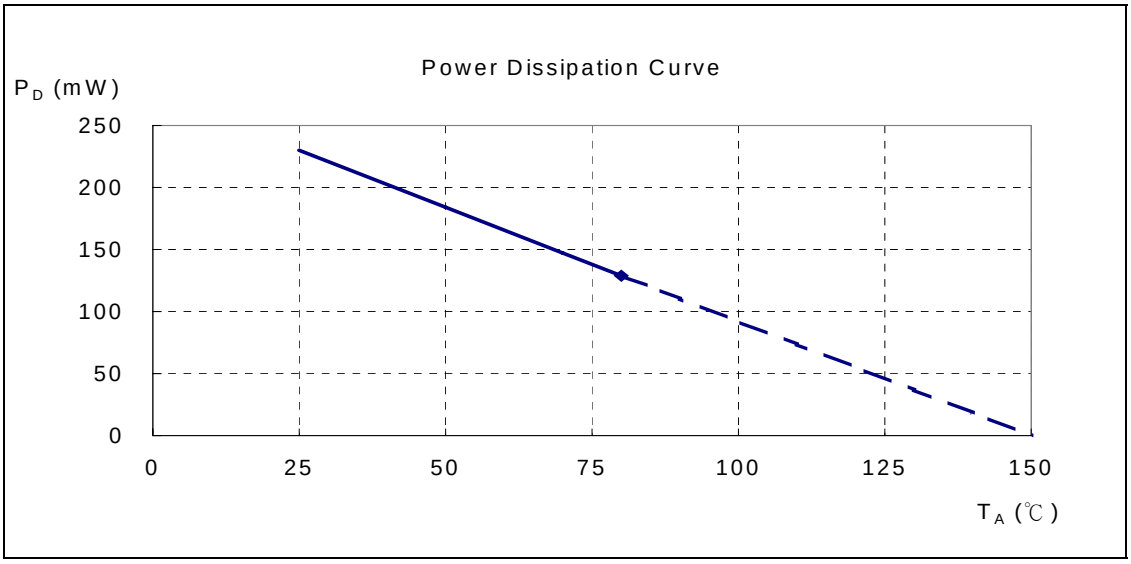
Note: 5. Typical data is at T_A = 25°C, Vdd = 3V, and for design information only.
6. Operating point and release point will vary with supply voltage and operating temperature.



Performance Characteristics

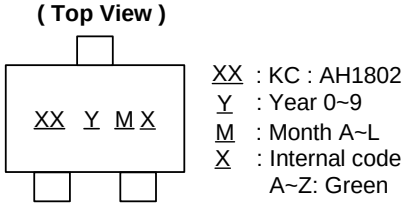
(1) SC59 and DFN2020-6

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

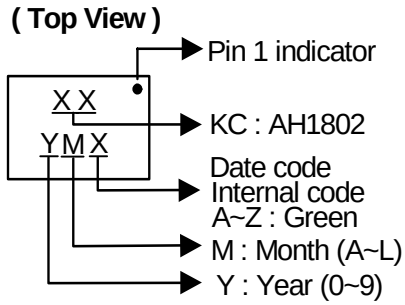


Marking Information

(1) SC59



(2) DFN2020-6



Part Number	Package	Identification Code
AH1802	SC59	KC

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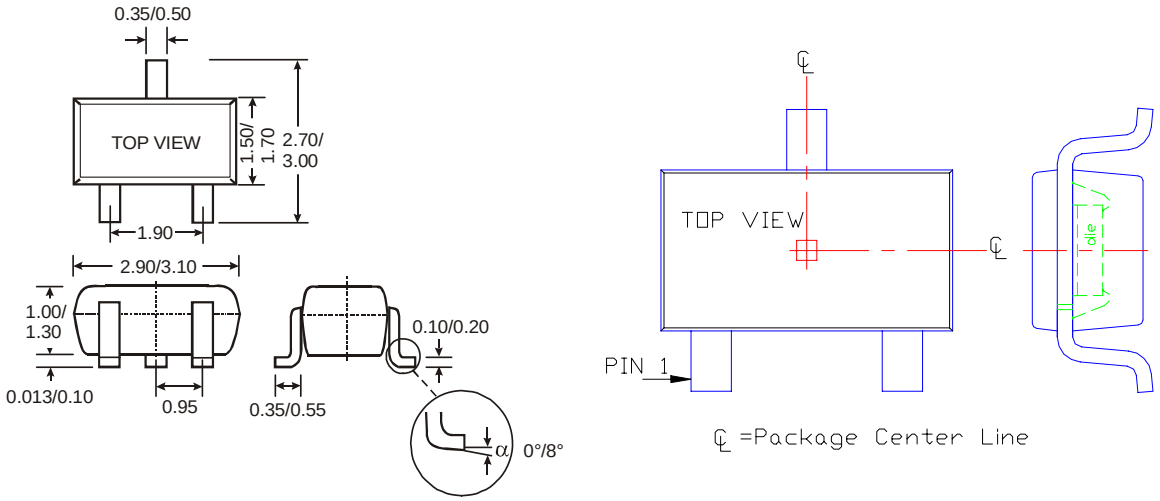
AH1802	DFN2020-6	KC

Package Information (unit: mm)

(1) SC59 (commonly known as SOT23 in Asia)



(2) DFN2020-6