AH1803

MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH

Features

- Micropower operation
- Operation with North or South Pole
- 2.4 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
- Low profile 3 pin SC59 (commonly known as SOT23 in Asia) and DFN2020-6 package
- ESD (HBM) ＞ 4KV for DFN2020-6
- SC59 and DFN2020-6: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

General Description

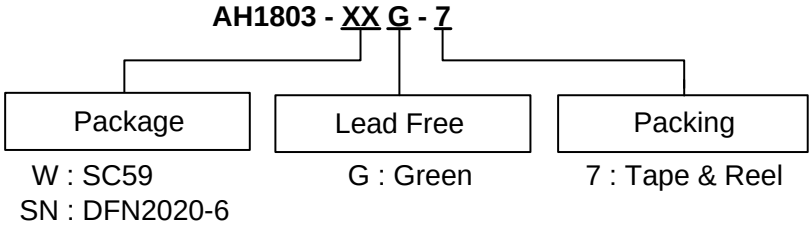
AH1803 is with two Hall effect plates and a CMOS output driver, mainly designed for battery–operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total operation power is down to 24uW in the 3V supply.

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 operate point **(Bop)**, the output will be turned on (low), the output is held until **B** is lower than release point **(Brp),** then turned off (High).

Applications

- Cellular phone
- PDA
- Cordless phone

Ordering Information

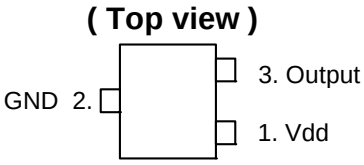


Product	Package Code	Packaging (Note 2)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1803-WG-7	W	SC59	3000/Tape & Reel	-7
AH1803-SNG-7	SN	DFN2020-6	3000/Tape & Reel	-7

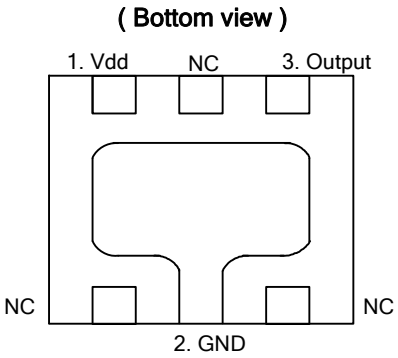
Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.
2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

Pin Assignments

(1) SC59



(2) DFN2020-6

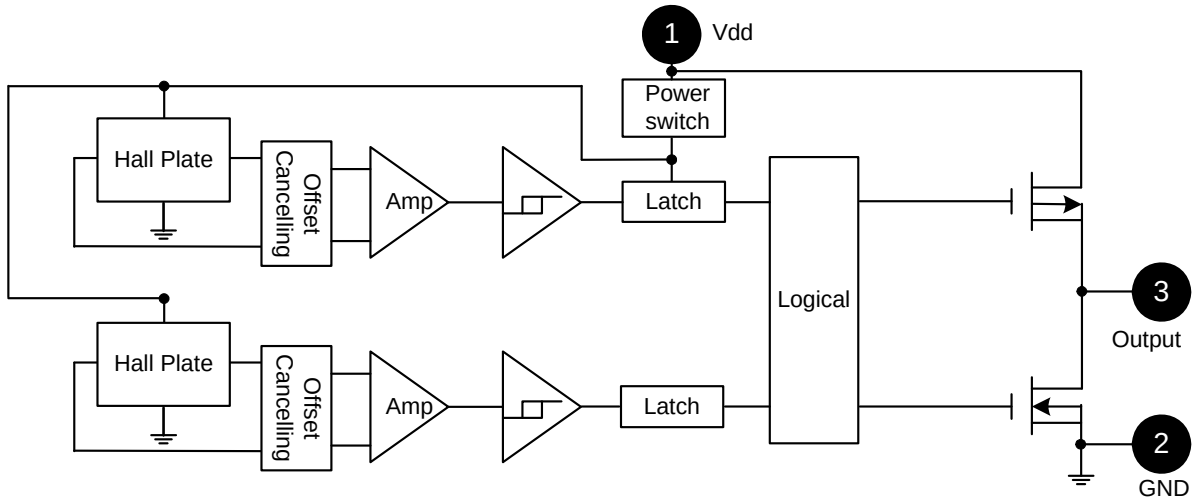


Notes: 3. NC is "No Connection", which is recommended to be tied to ground.

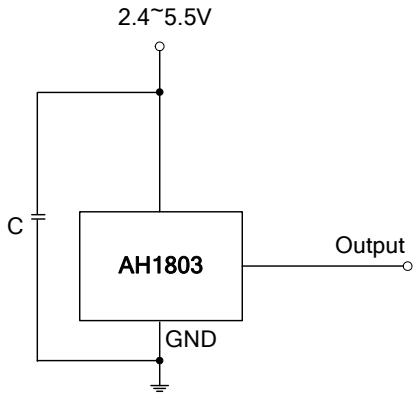
Pin Descriptions

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



Notes: 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	
Ts	Storage Temperature Range		-65 to +150	°C
P_D	Package Power Dissipation	SC59	230	mW
		DFN2020-6	230	mW
T_J	Maximum Junction Temperature		150	°C

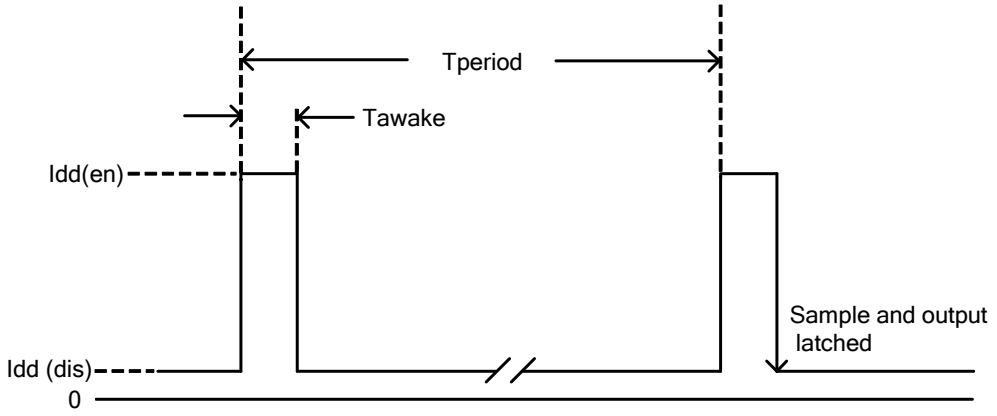
Recommended Operating Conditions (T_A = 25°C)

Symbol	Parameter	Conditions	Rating	Unit
Vdd	Supply Voltage	Operating	2.4~5.5	V
T_A	Operating Temperature Range	Operating	-40 to +85	°C

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
Idd(en)	Supply Current	Chip enable, T_A = 25°C , Vdd = 3V	-	3	6	mA
		Chip enable, T_A = -40~85°C , Vdd = 2.4~5.5V	-	3	9	mA
Idd(dis)		Chip disable, T_A = 25°C, Vdd = 3V	-	5	10	µA
		Chip disable, T_A = -40~85°C, Vdd = 2.4~5.5V	-	5	18	µA
Idd(avg)		Average supply current, T_A = 25°C , Vdd = 3V	-	8	16	µA
		Average supply current, T_A = -40~85°C, Vdd = 2.4~5.5V	-	8	27	µA
Tawake	Awake Time	(Note 5)	-	75	150	µs
Tperiod	Period	(Note 5)	-	75	150	ms
D.C.	Duty Cycle		-	0.1	-	%

Notes: 5. When power is initially on, the operating Vdd (2.4V to 5.5V) must be applied to be guaranteed for the output sampling. The output state is valid after the second operating phase (typical 150ms).

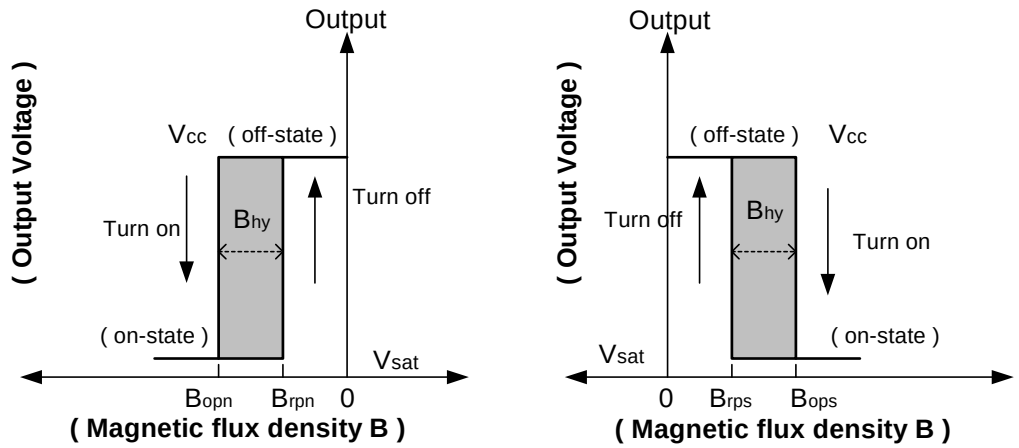


Magnetic Characteristics (TA = 25°C, Vdd = 3V)

1mT = 10G

Symbol	Characteristic	Min	Typ	Max	Unit
Bops(south pole to brand side)	Operate Point	2	3	4	mT
Bopn(north pole to brand side)		-4	-3	-2	
Brps(south pole to brand side)	Release Point	1	2	-	
Brpn(north pole to brand side)		-	-2	-1	
Bhy(|Bopx – Brpx|)	Hysteresis	0.5	1	-	

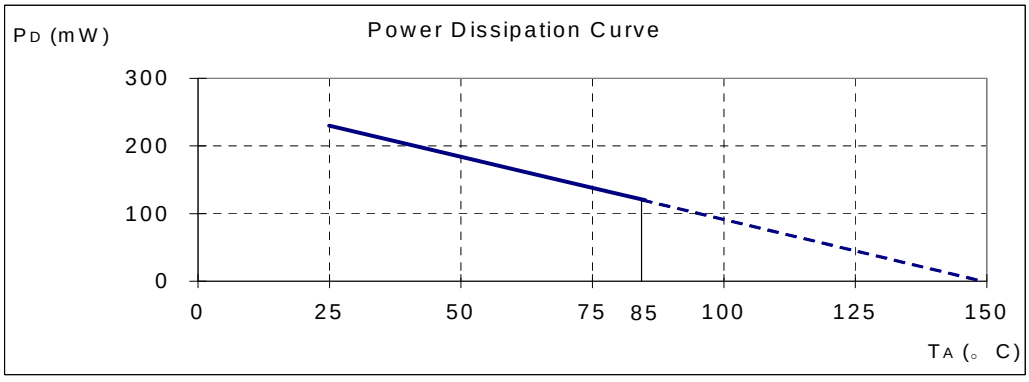
Notes: 6. Typical data is at T_A=25 °C, Vdd=3V, and for design information only.
7. Operate point and release point will vary with supply voltage and operating temperature.



Performance Characteristics

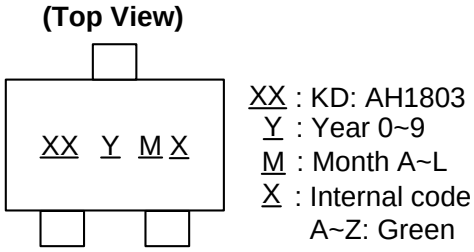
(1) SC59 and DFN2020-6

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



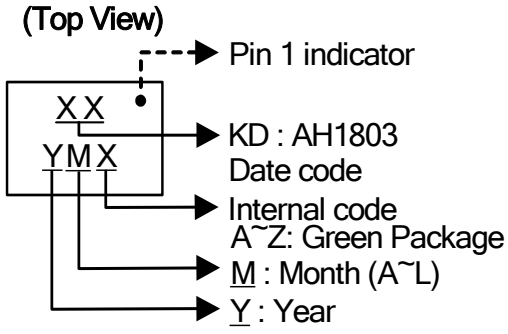
Marking Information

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



Part Number	Package	Identification Code
AH1803	SC59	KD

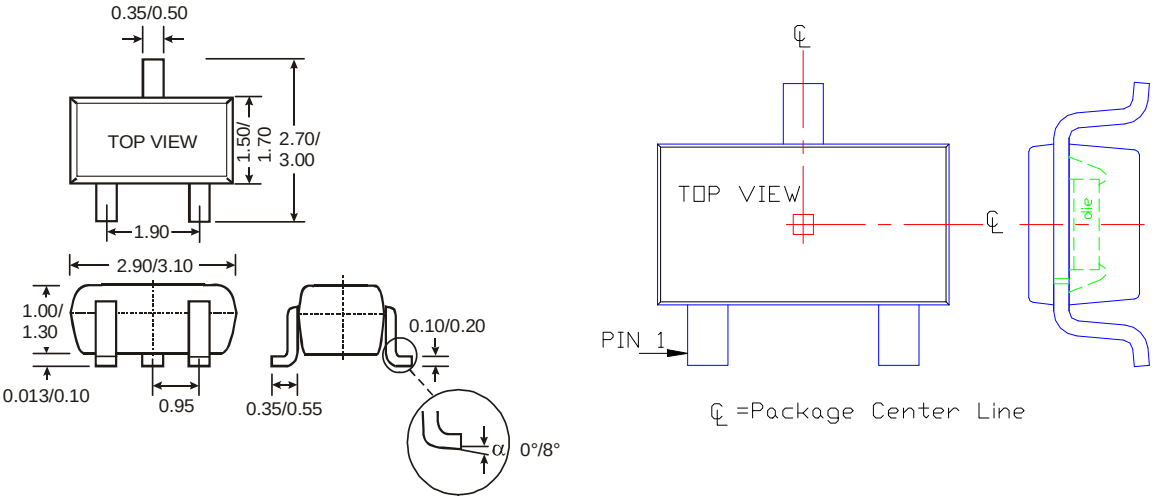
(2) DFN2020-6



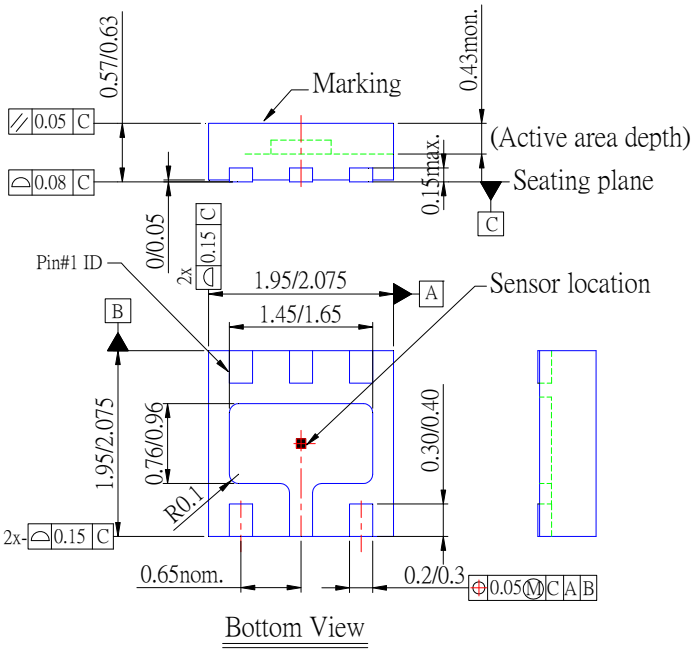
Part Number	Package	Identification Code
AH1803	DFN2020-6	KD

Package Information (All Dimensions in mm)

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

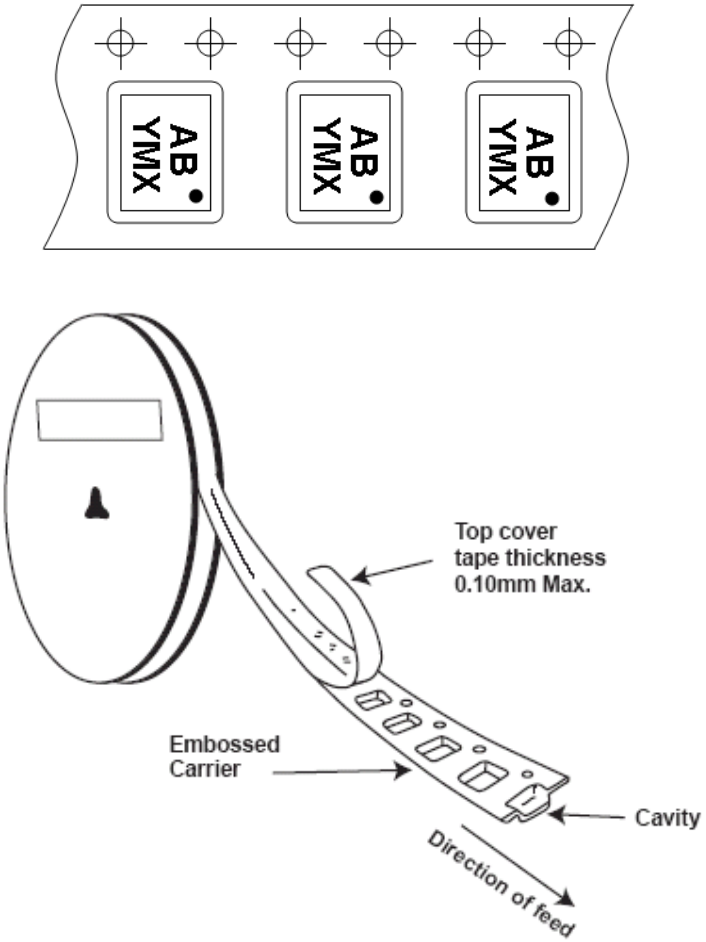


(2) Package Type: DFN2020-6



Taping Orientation

(1) DFN2020-6



Notes: 8. The taping orientation of the other package type can be found on our website at http://www.diodes.com/datasheets/ap02007.pdf.