

## 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 (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

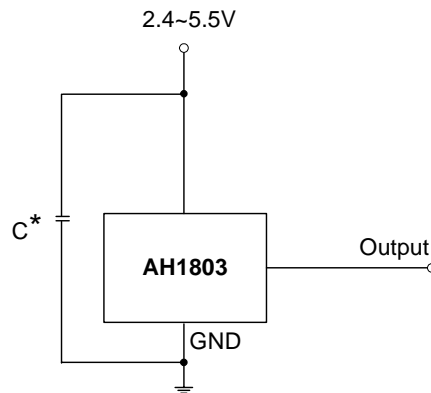
AH1803 is with two Hall effect plates and a CMOS output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total operation power is down to 24uW in the 3V supply.

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

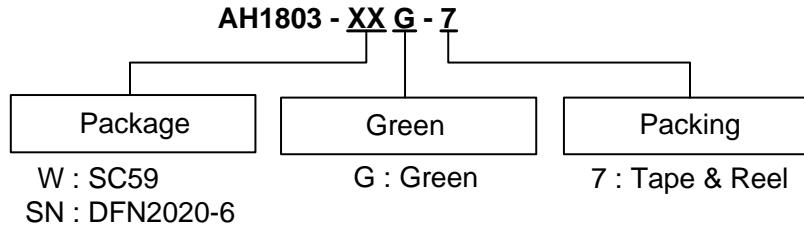
- Cellular phone
- PDA
- Cordless phone

## Typical Circuit



\* C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.

**Ordering Information**



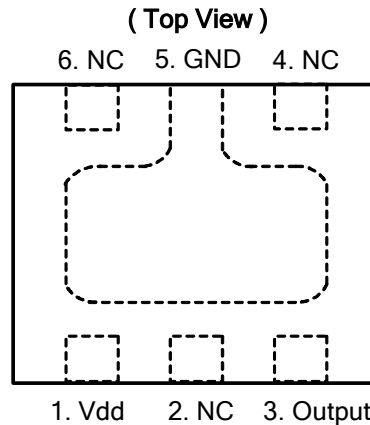
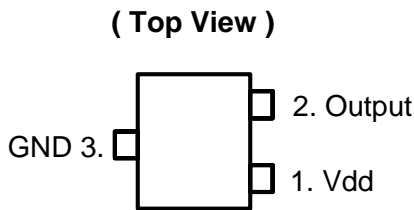
| Product      | Package Code | Packaging (Note 2) | 7" Tape and Reel |                    |
|--------------|--------------|--------------------|------------------|--------------------|
|              |              |                    | Quantity         | Part Number Suffix |
| AH1803-WG-7  | W            | 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. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).  
 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 (commonly known as SOT23 in Asia)

(2) DFN2020-6

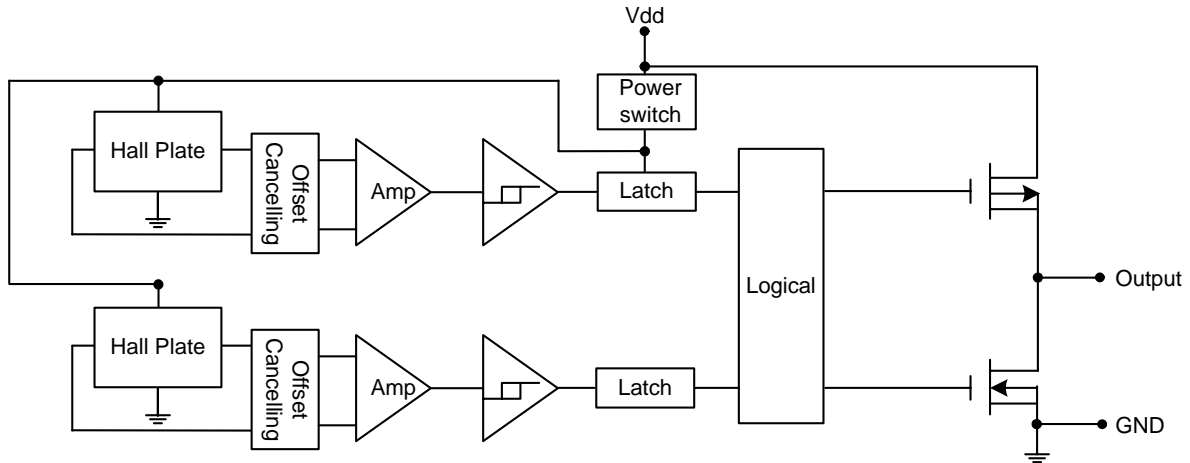


Notes: 3. NC is "No Connection", which is recommended to be tied to ground.

**Pin Descriptions**

| Pin Name | P/I/O | Description        |
|----------|-------|--------------------|
| Vdd      | P/I   | Power Supply Input |
| GND      | P/I   | Ground             |
| Output   | O     | Output Pin         |
| NC       |       | No Connected       |

## Block Diagram



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

| Symbol         | Characteristics              | Values      | Unit             |    |
|----------------|------------------------------|-------------|------------------|----|
| Vdd            | Supply voltage               | 7           | V                |    |
| B              | Magnetic flux density        | Unlimited   |                  |    |
| Ts             | Storage Temperature Range    | -65 to +150 | $^\circ\text{C}$ |    |
| P <sub>D</sub> | Package Power Dissipation    | SC59        | 230              | mW |
|                |                              | DFN2020-6   | 230              | mW |
| T <sub>J</sub> | Maximum Junction Temperature | 150         | $^\circ\text{C}$ |    |

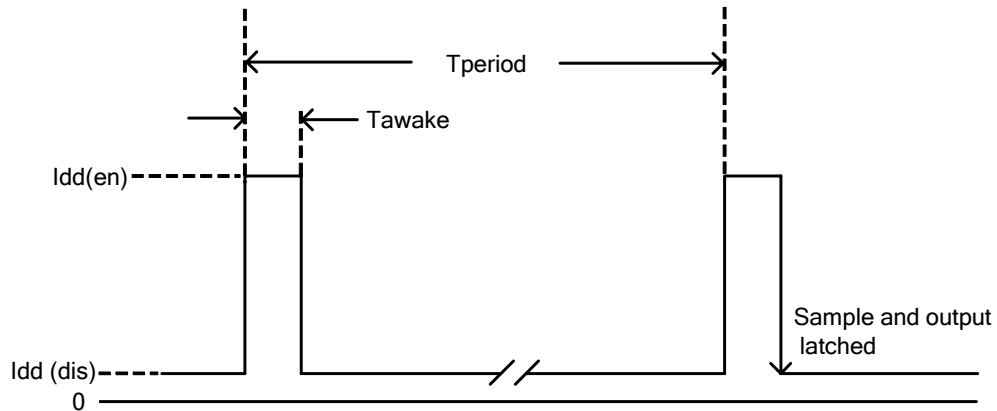
## Recommended Operating Conditions ( $T_A = 25^\circ\text{C}$ )

| Symbol         | Parameter                   | Conditions | Rating     | Unit             |
|----------------|-----------------------------|------------|------------|------------------|
| Vdd            | Supply Voltage              | Operating  | 2.4~5.5    | V                |
| T <sub>A</sub> | Operating Temperature Range | Operating  | -40 to +85 | $^\circ\text{C}$ |

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

| Symbol               | Characteristic                | Conditions  | Min                  | Typ. | Max | Unit |
|----------------------|-------------------------------|---|----------------------|------|-----|------|
| V <sub>OH</sub>      | Output On Voltage (High side) | I <sub>OUT</sub> = -1mA   | V <sub>dd</sub> -0.2 | -    | -   | V    |
| V <sub>OL</sub>      | Output On Voltage (Low side)  | I <sub>OUT</sub> = 1mA  | -                    | -    | 0.1 | V    |
| I <sub>dd(en)</sub>  | Supply Current                | Chip enable, T <sub>A</sub> = 25°C, V <sub>dd</sub> = 3V                      | -                    | 3    | 6   | mA   |
|                      |                               | Chip enable, T <sub>A</sub> = -40~85°C, V <sub>dd</sub> = 2.4~5.5V            | -                    | 3    | 9   | mA   |
| I <sub>dd(dis)</sub> |                               | Chip disable, T <sub>A</sub> = 25°C, V <sub>dd</sub> = 3V                     | -                    | 5    | 10  | μA   |
|                      |                               | Chip disable, T <sub>A</sub> = -40~85°C, V <sub>dd</sub> = 2.4~5.5V           | -                    | 5    | 18  | μA   |
| I <sub>dd(avg)</sub> |                               | Average supply current, T <sub>A</sub> = 25°C, V <sub>dd</sub> = 3V           | -                    | 8    | 16  | μA   |
|                      |                               | Average supply current, T <sub>A</sub> = -40~85°C, V <sub>dd</sub> = 2.4~5.5V | -                    | 8    | 27  | μA   |
| T <sub>awake</sub>   | Awake Time                    | (Note 5)  | -                    | 75   | 150 | μs   |
| T <sub>period</sub>  | Period                        | (Note 5)  | -                    | 75   | 150 | ms   |
| D.C.                 | Duty Cycle                    |   | -                    | 0.1  | -   | %    |

Notes: 5. When power is initially on, the operating V<sub>dd</sub> (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).

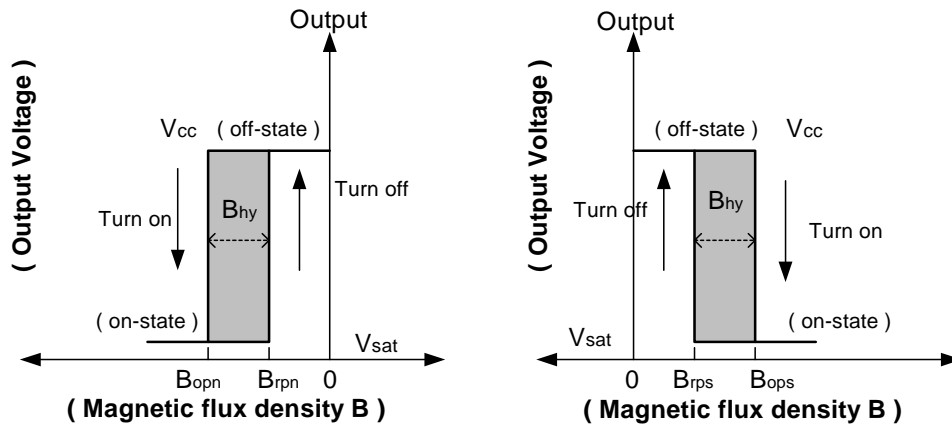


**Magnetic Characteristics** (TA = 25°C, Vdd = 3V, Note 6, 7)

(1mT = 10G)

| Symbol                         | Parameter       | Min | Typ. | Max | Unit |
|--------------------------------|-----------------|-----|------|-----|------|
| Bops(south pole to brand side) | Operation 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    | -   |      |

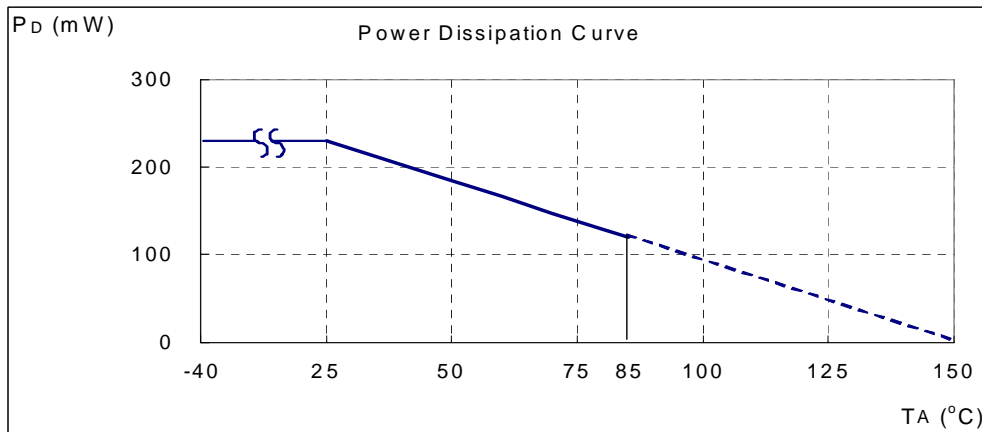
Notes: 6. Typical data is at TA=25 °C, Vdd=3V, and for design information only.  
7. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



**Performance Characteristics**

(1) SC59 (commonly known as SOT23 in Asia) and DFN2020-6

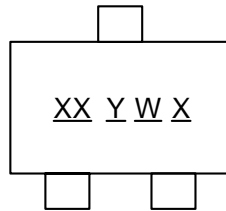
| TA (°C) | 25  | 50  | 60  | 70  | 80  | 85  | 90  | 100 | 110 | 120 | 130 | 140 | 150 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| PD (mW) | 230 | 184 | 166 | 147 | 129 | 120 | 110 | 92  | 74  | 55  | 37  | 18  | 0   |



**Marking Information**

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

( Top View )

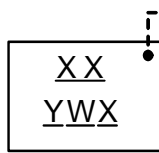


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Green

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH1803      | SC59    | KD                  |

(2) DFN2020-6

( Top View )



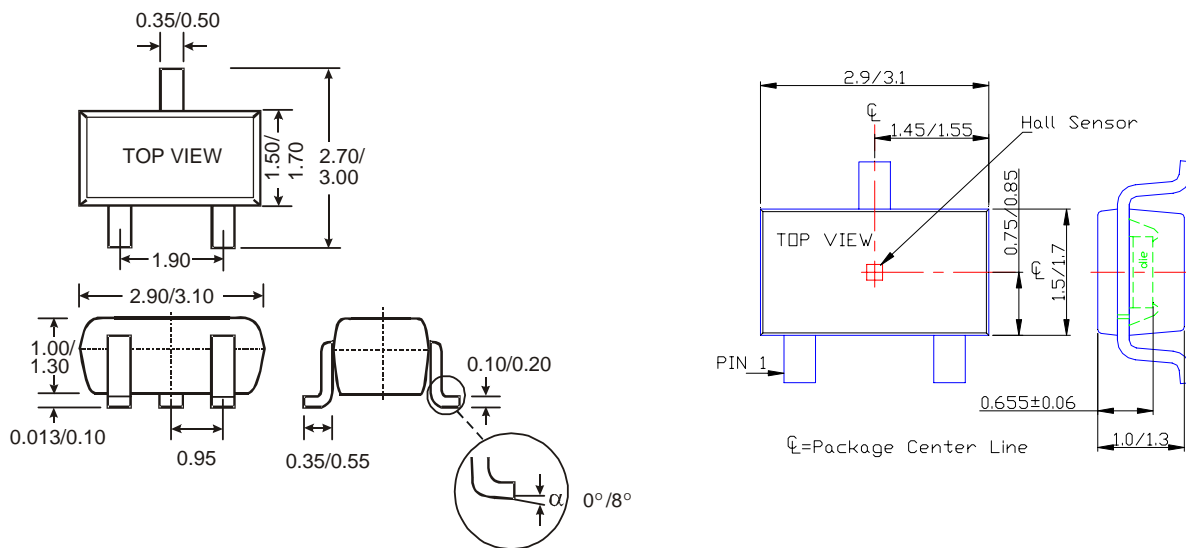
Pin 1 indicator

XX : Identification Code  
Y : Year : 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Green

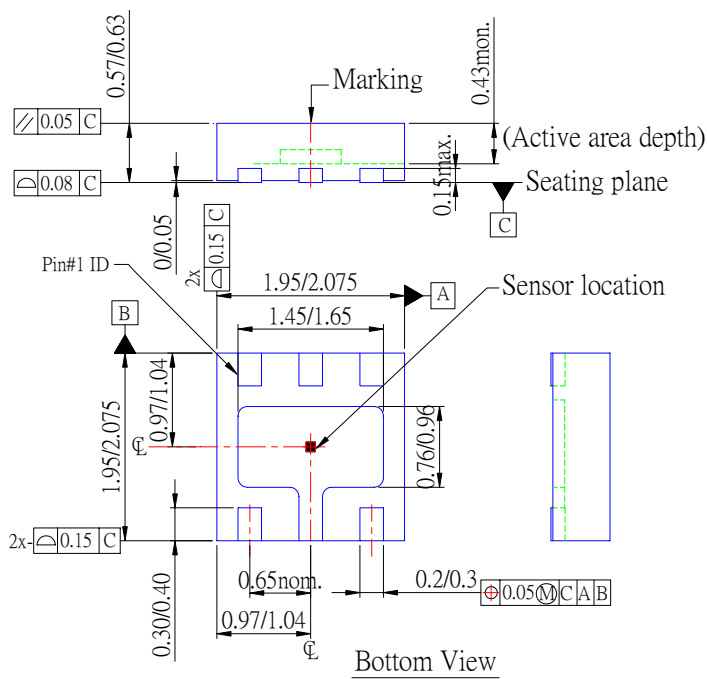
| Part Number | Package   | Identification Code |
|-------------|-----------|---------------------|
| AH1803      | DFN2020-6 | KD                  |

**Package Information (All Dimensions in mm)**

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



**(2) Package Type: DFN2020-6**

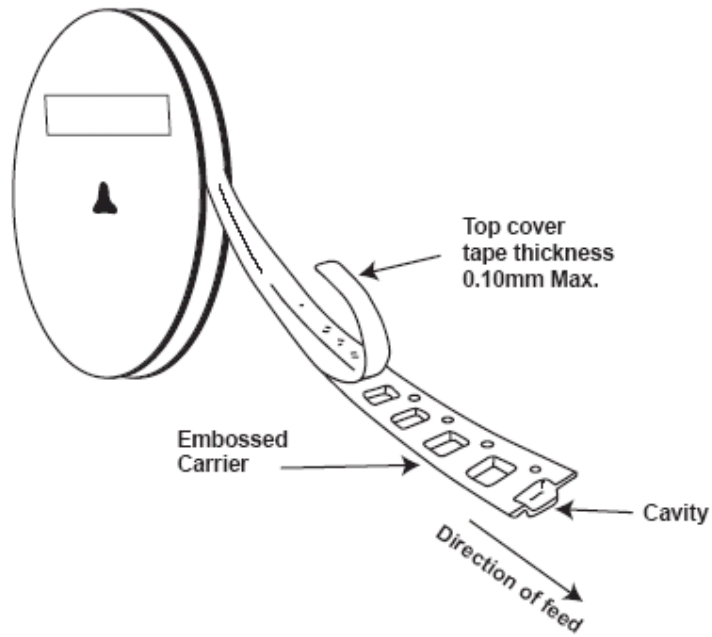
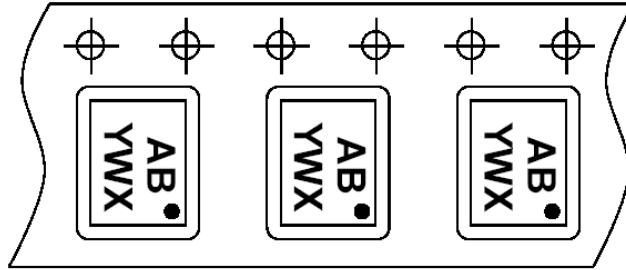


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**Taping Orientation**

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For 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>.



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