

MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH

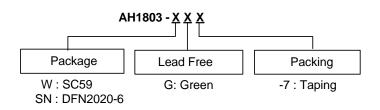
Features

- 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
- Lead Free Finish / RoHS Compliant (Note 1)
- Green Packages: SC59 and DFN2020-6

Applications

- Cellular phone
- PDA
- Cordless phone

Ordering Information



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

| | Device Package Code | | vice Package Code Packaging | | and Reel |
|-------------|---------------------|--------------|-----------------------------|------------------|--------------------|
| | Device | Fackage Code | (Note 2) | Quantity | Part Number Suffix |
| Pb , | AH1803-W | W | SC59 | 3000/Tape & Reel | -7 |
| Pb, | AH1803-SN | SN | DFN2020-6 | 3000/Tape & Reel | -7 |

2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at Note: http://www.diodes.com/datasheets/ap02001.pdf

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.

AH1803

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).



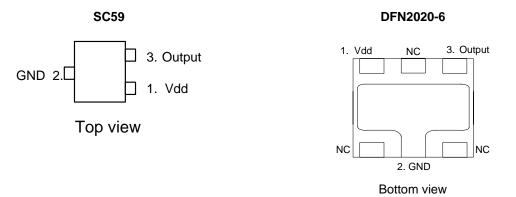
AH1803

MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH

Pin Description

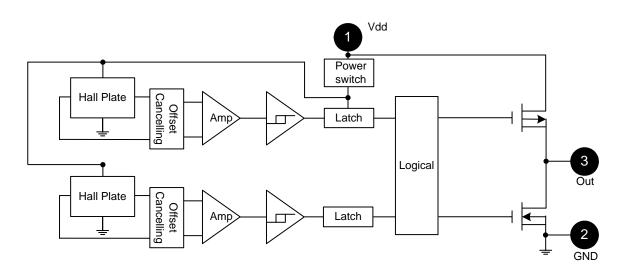
| Name | P/I/O | Pin # | Description |
|--------|-------|-------|--------------------|
| Vdd | P/I | 1 | Power Supply Input |
| GND | P/I | 2 | Ground |
| Output | 0 | 3 | Output Pin |

Pin Assignment



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

Block Diagram

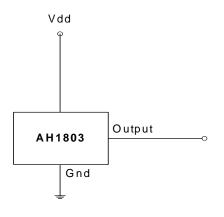




AH1803

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Typical Circuit



Absolute Maximum Ratings (@ $TA = 25^{\circ}C$)

| Symbol | Characterist | Values | Unit | |
|--------|------------------------------|------------|-------------|----|
| Vdd | Supply voltage | | 7 | V |
| В | Magnetic flux density | Unlimi | ted | |
| TA | Operating Temperature Range | -40 to +85 | °C | |
| Ts | Storage Temperature Range | | -65 to +150 | °C |
| PD | Package Power Dissipation | SC59 | 230 | mW |
| гD | DFN2020-6 | | 230 | mW |
| TJ | Maximum Junction Temperature | 150 | °C | |

Recommended Operating Conditions $(TA = 25^{\circ}C)$

| Symbol | Parameter | Conditions | Rating | Unit |
|--------|----------------|------------|---------|------|
| Vdd | Supply Voltage | Operating | 2.4~5.5 | V |



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

| Symbol | Characteristic | Conditions | Min | Тур | Max | Unit |
|----------|------------------------|---------------------------------------------------------|-----|------|-----|------|
| Vout | Output On Voltage | lout =1mA | - | 0.1 | 0.3 | V |
| loff | Output Leakage Current | Vout = 5.5V, Brpn < B < Brps | - | <0.1 | 1 | μA |
| | | Chip enable, TA = 25°C, Vdd = 3V | - | 3 | 6 | mA |
| ldd(en) | | Chip enable, TA = -40~85°C, Vdd = 2.4~5.5V | - | 3 | 9 | mA |
| | | Chip disable, $TA = 25^{\circ}C$, Vdd = 3V | - | 5 | 10 | μA |
| ldd(dis) | Supply Current | Chip disable, TA = -40~85°C, Vdd = 2.4~5.5V | - | 5 | 14 | μA |
| Idd(ova) | | Average supply current, TA = 25°C, Vdd = 3V | - | 8 | 16 | μA |
| ldd(avg) | | Average supply current, TA= -40~85°C, Vdd = 2.4~5.5V | | 8 | 23 | μA |
| Tawake | Awake Time | | - | 75 | 150 | μs |
| Tperiod | Period | | - | 75 | 150 | ms |
| D.C. | Duty Cycle | | - | 0.1 | - | % |

Magnetic Characteristics $(TA = 25^{\circ}C, Vdd = 3V)$

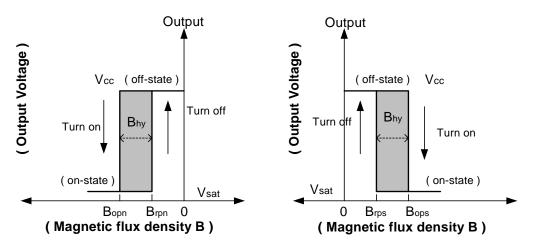
(1mT=10 Gauss)

AH1803

| | | | | (–) | <u>0 0aussj</u> |
|--------------------------------|----------------|-----|-----|-------|-----------------|
| Symbol | Characteristic | Min | Тур | Max | Unit |
| Bops(south pole to brand side) | Operate Point | 2 | 3 | 4 | |
| Bopn(north pole to brand side) | | -4 | -3 | -2 | |
| Brps(south pole to brand side) | Release Point | 1 | 2 | - | mT |
| Brpn(north pole to brand side) | Release Folin | - | -2 | -1 | |
| Bhy(Bopx – Brpx) | Hysteresis | 0.5 | 1 | - | |

Note:

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



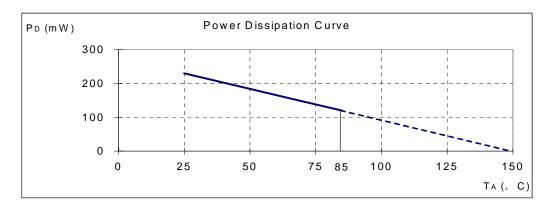


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Performance Characteristics

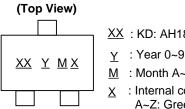
(1) SC59 and DFN2020-6

| 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



| <u> </u> | : KD: AH1803 |
|----------|-------------------------------|
| Y | : Year 0~9 |
| M | : Month A~L |
| K | : Internal code A~Z: Green |

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

| (2) DFN2020-6 | |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| (Top View) | |
| Г | Pin 1 indicator |
| <u>х</u> х • <u>ҮМ</u> Х | → KD : AH1803 Date code → Internal code A~Z: Green Package → M : Month (A~L) → Y : Year |

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

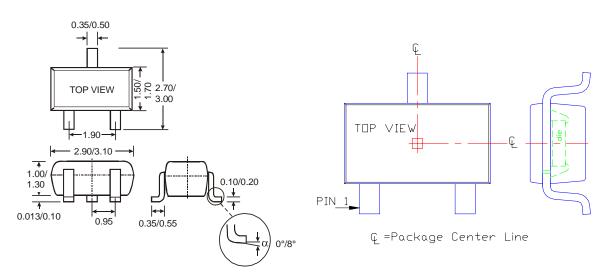


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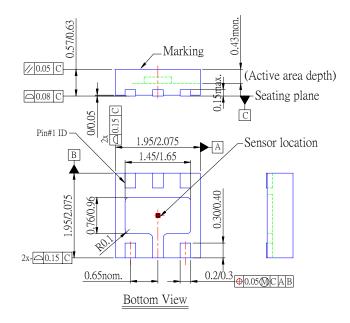
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Package Information (unit: mm)

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



(2) Package Type: DFN2020-6





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SWITCH

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