

Features

- Micropower operation
- 2.5V to 5.5V battery operation
- Offset Canceling Technology
- Superior temperature stability
- Extremely Low Switch-Point Drift
- Insensitive to Physical Stress
- -40°C to 85°C operating temperature
- Lead Free packages: SIP-3L and SC59 (Commonly known as SOT23 in Asia)
- SIP-3L and SC59: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish / RoHS Compliant (Note 1)

General Description

AH182/AH183 is a three-terminal Hall effect sensor device with an output driver, mainly designed for battery-operation, hand-held equipment (such as cellular and cordless phones, and PDA's) The total operation power is down to 15uW in the 2.75V supply.

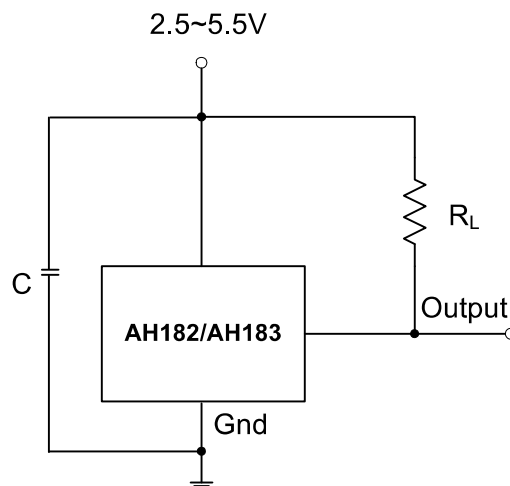
The south pole of sufficient strength will turn the output on in SIP-3L but the north pole of sufficient strength will turn the output on in SC59 package. The output will be turned off under no magnetic field.

While the magnetic flux density (**B**) is larger than operation point (**B_{op}**), the output will be turned on (low), the output is held until **B** is lower than the release point (**B_{rp}**), then turned off. The difference between AH182 and AH183 is that the former consumes less power than that of the latter in the Hall sensor operation.

Applications

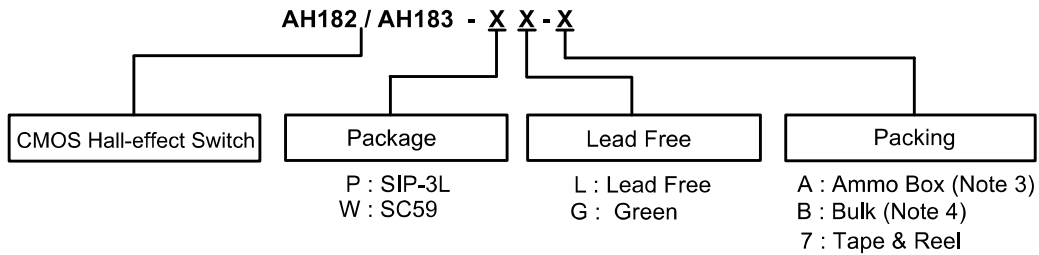
- Cover detector
- Speed measurement
- Home safety

Typical Circuit *



- * C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.
R_L is the pull-up resistor, the recommended resistance is 10Kohm~100Kohm.

Ordering Information



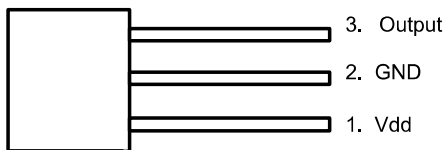
| Device | Package Code | Packaging (Note 2) | Bulk | | 7" Tape and Reel | | Ammo Box | |
|------------------|--------------|--------------------|----------|--------------------|------------------|--------------------|----------|--------------------|
| | | | Quantity | Part Number Suffix | Quantity | Part Number Suffix | Quantity | Part Number Suffix |
| AH182/AH183-PL-A | P | SIP-3L | NA | NA | NA | NA | 4000/Box | -A |
| AH182/AH183-PL-B | P | SIP-3L | 1000 | -B | NA | NA | NA | NA |
| AH182/AH183-PG-A | P | SIP-3L | NA | NA | NA | NA | 4000/Box | -A |
| AH182/AH183-PG-B | P | SIP-3L | 1000 | -B | NA | NA | NA | NA |
| AH182/AH183-WL-7 | W | SC59 | NA | NA | 3000/Tape & Reel | -7 | NA | NA |
| AH182/AH183-WG-7 | W | SC59 | NA | NA | 3000/Tape & Reel | -7 | NA | NA |

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
 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. Ammo Box is for SIP-3L Spread Lead.
 4. Bulk is for SIP-3L Straight Lead.

Pin Assignments

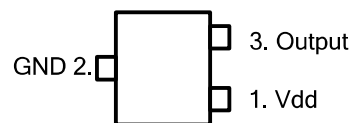
(1) SIP-3L

(Top view)



(2) SC59 (Commonly known as SOT23 in Asia)

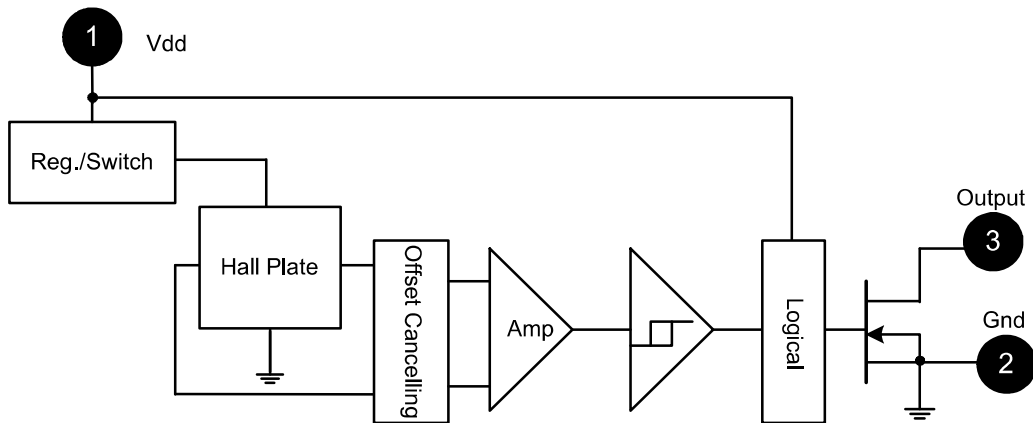
(Top view)



Pin Description

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

Block Diagram



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

| Symbol | Parameter | Rating | Unit | |
|---------------------|------------------------------|-------------|------|----|
| V _{DD} | Supply Voltage | 7 | V | |
| B | Magnetic Flux Density | Unlimited | | |
| I _{OUT} | Output current | 10 | mA | |
| P _D | Power Dissipation | SIP-3L | 550 | mW |
| | | SC59 | 230 | mW |
| T _{J(MAX)} | Maximum Junction Temperature | 150 | °C | |
| T _{ST} | Storage Temperature Range | -65 to +150 | °C | |

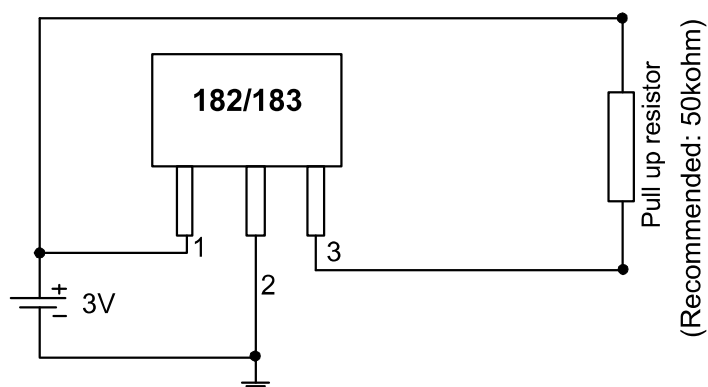
Recommended Operating Conditions ($T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------------|-------------------------------|------------|-----|-----|------|
| V _{DD} | Supply Voltage | Operating | 2.5 | 5.5 | V |
| T _A | Operating Ambient Temperature | Operating | -40 | 85 | °C |

Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$)

| Symbol | Characteristic | Conditions | Min | Typ. | Max | Unit |
|---------------|------------------------|-------------------------------------|-----|------|-----|---------------|
| V_{OUT} | Output On Voltage | $I_{OUT} = 1\text{mA}$ | - | 0.1 | 0.3 | V |
| I_{off} | Output Leakage Current | $V_{OUT} = 5.5\text{V}$, $B < Brp$ | - | <0.1 | 1 | μA |
| $I_{dd(en)}$ | Supply Current | Chip enable | - | - | 2.0 | mA |
| $I_{dd(dis)}$ | | Chip disable | - | - | 8.0 | μA |
| $I_{dd(avg)}$ | | AH182: average supply current | - | 5 | 10 | μA |
| $I_{dd(avg)}$ | | AH183: average supply current | - | 280 | 500 | μA |
| T_{awake} | Awake Time | | - | 50 | 100 | μs |
| T_{period} | Period | AH182 | - | 50 | 100 | ms |
| | | AH183 | - | 200 | 400 | μs |
| D.C. | Duty Cycle | AH182 | - | 0.1 | - | % |
| | | AH183 | - | 25 | - | % |

Test Circuit

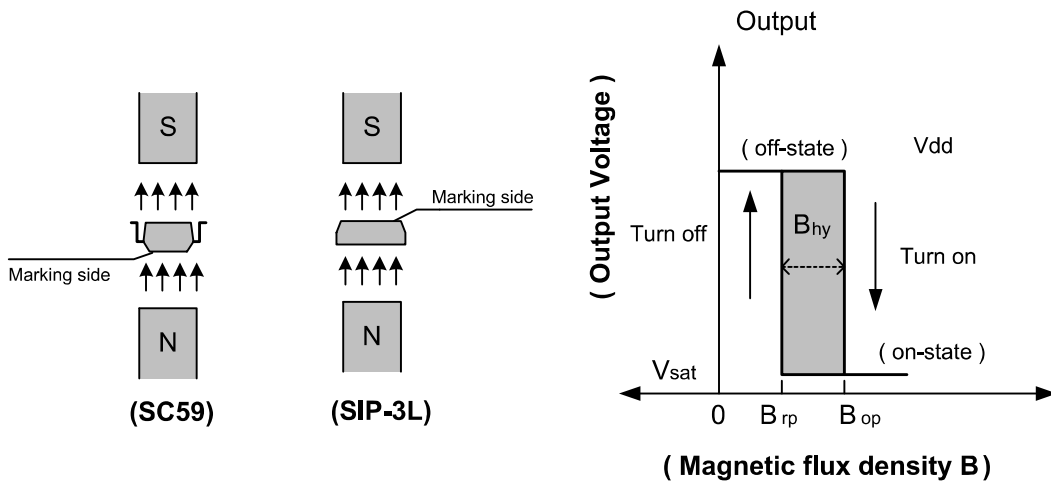


Magnetic Characteristics (T_A = 25°C, V_{dd} = 3V, Note 5)

(1mT = 10 Gauss)

| Symbol | Parameter | Min | Typ. | Max | Unit |
|--|-----------------|-----|------|-----|-------|
| B _{ops} (south pole to brand side) | Operation Point | - | 40 | 60 | Gauss |
| B _{rps} (south pole to brand side) | Release Point | 10 | 30 | - | |
| B _{hy} (B _{opx} - B _{rpx}) | Hysteresis | - | 10 | - | |

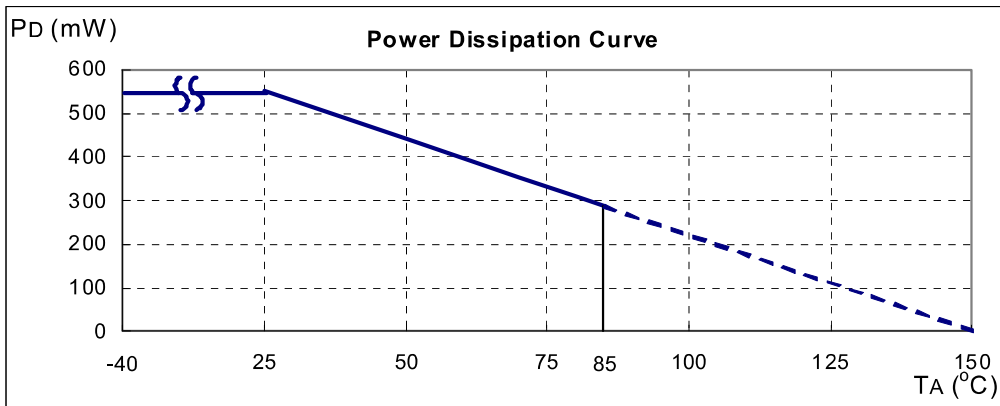
Notes: 5. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



Performance Characteristics

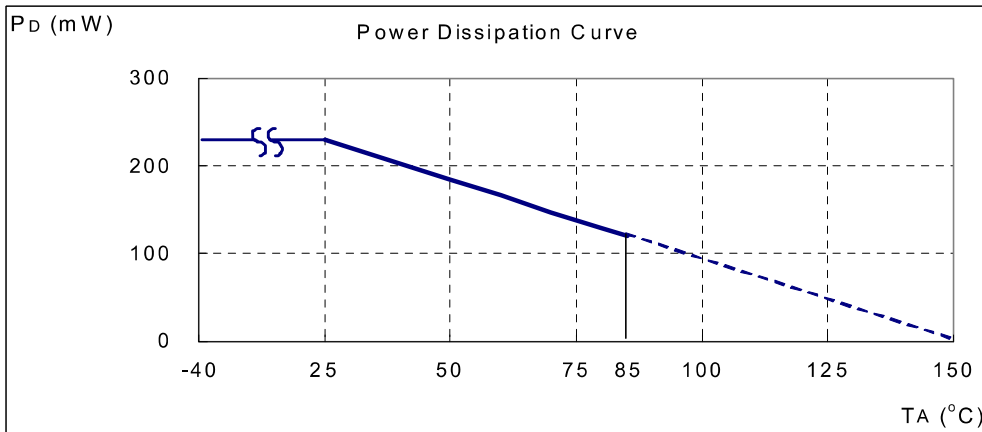
(1) SIP-3L

| | | | | | | | | | |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| TA (°C) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 95 | 100 |
| PD (mW) | 550 | 440 | 396 | 352 | 308 | 286 | 264 | 242 | 220 |
| TA (°C) | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 150 |
| PD (mW) | 198 | 176 | 154 | 132 | 110 | 88 | 66 | 44 | 0 |



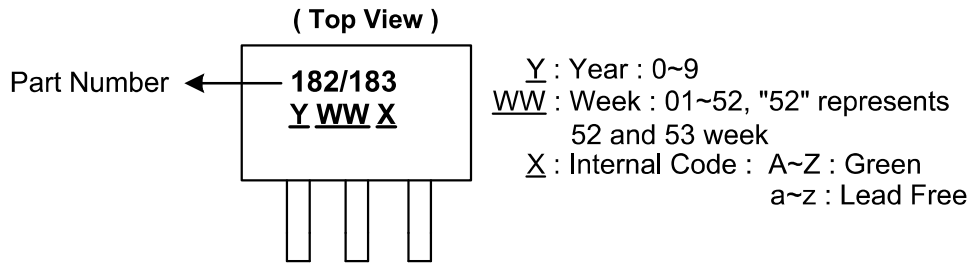
(2) SC59 (Commonly known as SOT23 in Asia)

| | | | | | | | | | | | | | |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| 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 |

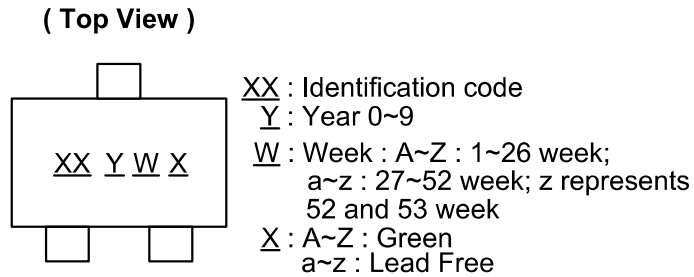


Marking Information

(1) SIP-3L



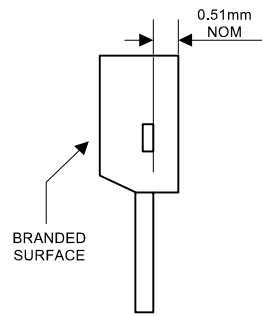
(2) SC59 (Commonly known as SOT23 in Asia)



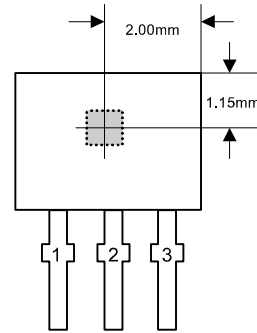
| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH182 | SC59 | K2 |
| AH183 | SC59 | K3 |

Package Information (All Dimensions in mm)

(1) Package Type: SIP-3L for Bulk only

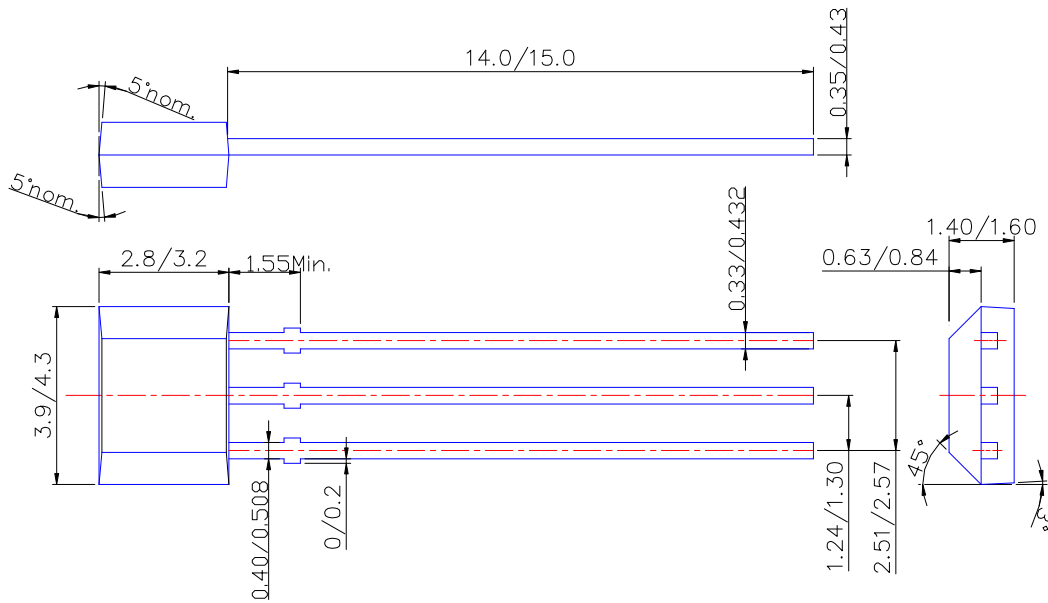


Active Area Depth



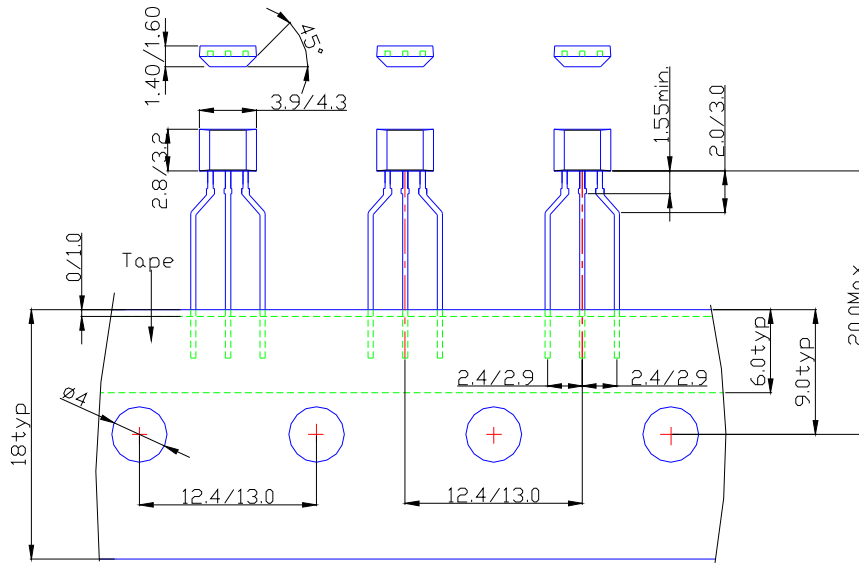
Sensor Location

Package Dimension

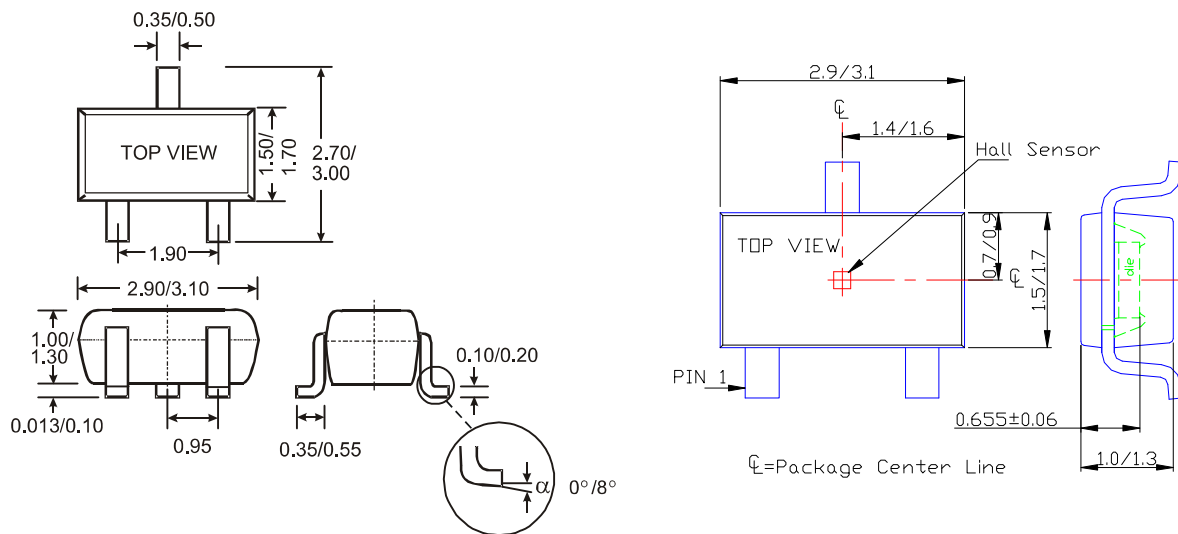


Package Information (Continued)

(2) Package Type: SIP-3L for Ammo Pack-only



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



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