

Description

AH1887 is with two Hall effect plates and dual CMOS output driver, mainly designed for battery-powered, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total operation power is down to 15uW in the 1.8V supply. Either north or south pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field.

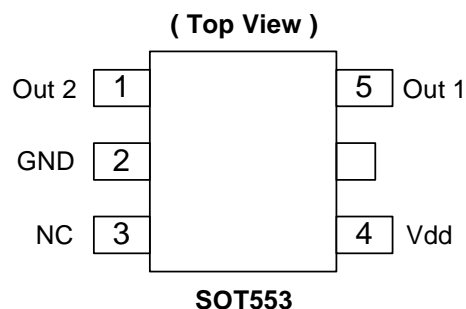
While the magnetic flux density (**B**) is larger than operate point **Bop(s)**, the output1 will be turned on (low), the output is held until **B** is lower than release point **Brp(s)**, then turned off (high).

While the magnetic flux density (**B**) is larger than operate point **Bop(n)**, the output2 will be turned on (low), the output is held until **B** is lower than release point **Brp(n)**, then turned off (high).

Features

- Micropower operation
- Operation with North or South Pole
- 1.65V to 3.3V 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
- ESD > 4KV in human body mode
- Package: SOT553
- "Green" Molding Compound

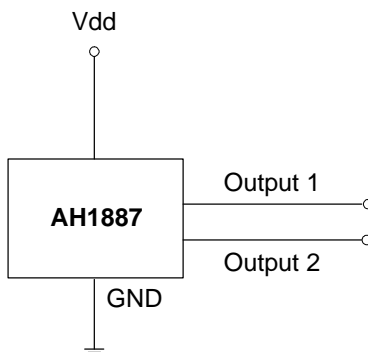
Pin Assignments



Applications

- Cellular phone
- PDA
- Cordless phone

Typical Application Circuit

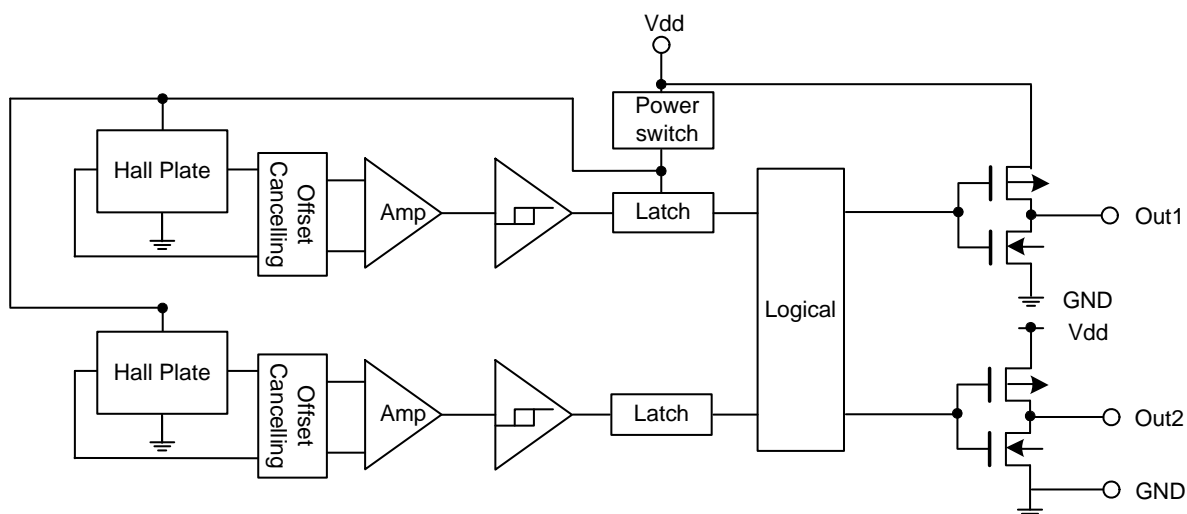


Pin Descriptions

| Pin Name | P/I/O | Pin # | Description |
|----------------|-------|-------|---------------------------|
| Out 2 (Note 1) | O | 1 | Output Pin (active Low) |
| GND | P/I | 2 | Ground |
| NC | | 3 | No Connection |
| Vdd | P/I | 4 | Power Supply Voltage |
| Out 1 (Note 1) | O | 5 | Output Pin (active Low) |

Notes: 1. Output1 responds to South pole; Output2 responds to North pole.

Functional Block Diagram



Absolute Maximum Ratings (T_A = 25°C)

| Symbol | Characteristics | Values | Unit |
|-----------------|------------------------------|-------------|------|
| V _{dd} | Supply voltage | 5 | V |
| B | Magnetic flux density | Unlimited | |
| T _S | Storage Temperature Range | -65 to +150 | °C |
| P _D | Package Power Dissipation | 230 | mW |
| T _J | Maximum Junction Temperature | 150 | °C |

Recommended Operating Conditions (T_A = 25°C)

| Symbol | Parameter | Conditions | Rating | Unit |
|-----------------|-----------------------------|------------|-------------|------|
| V _{dd} | Supply Voltage | Operating | 1.65 to 3.3 | V |
| T _A | Operating Temperature Range | Operating | -40 to +85 | °C |

Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{dd} = 1.8\text{V}$, unless otherwise specified)

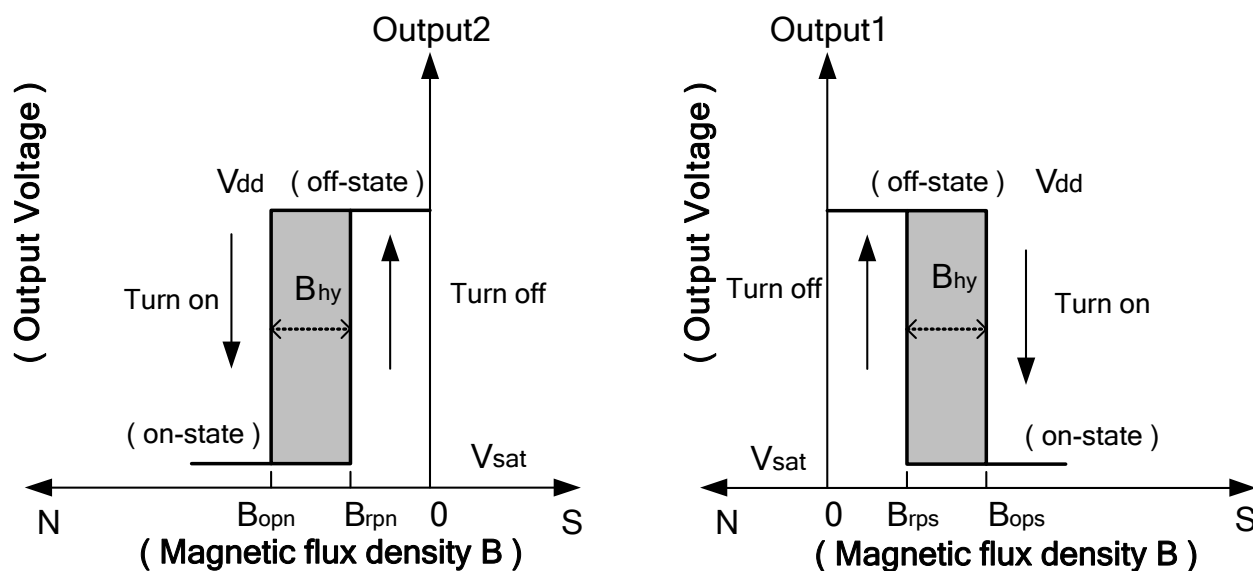
| Symbol | Characteristic | Conditions | Min | Typ. | Max | Unit |
|---------------|-------------------------------|------------------------|--------------|------|-----|---------------|
| V_{OH} | Output On Voltage (High side) | $I_O = -0.5\text{mA}$ | $V_{dd}-0.2$ | - | - | V |
| V_{OL} | Output On Voltage (Low side) | $I_O = 0.5\text{mA}$ | - | - | 0.2 | V |
| $I_{dd(en)}$ | Supply Current | Chip enable | - | 2 | 4 | mA |
| $I_{dd(dis)}$ | | Chip disable | - | 5 | 8 | μA |
| $I_{dd(avg)}$ | | average supply current | - | 7 | 12 | μA |
| Tawake | Awake Time | | - | 50 | 100 | μs |
| Tperiod | Period | | - | 50 | 100 | ms |
| D.C. | Duty Cycle | | - | 0.1 | - | % |

Magnetic Characteristics ($T_A = 25^\circ\text{C}$, $V_{dd} = 1.8\text{V}\sim 3.0\text{V}$, Note 2, 3, 4)

(1mT=10 Gauss)

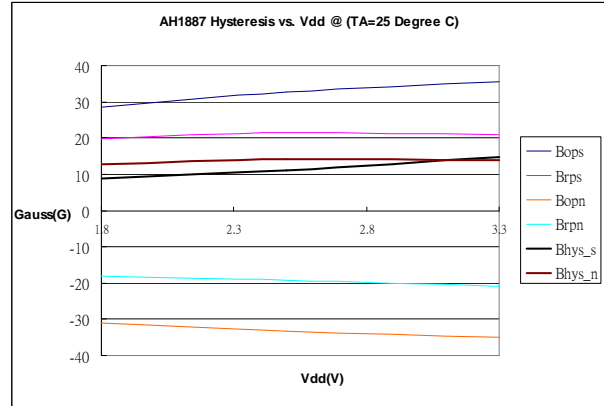
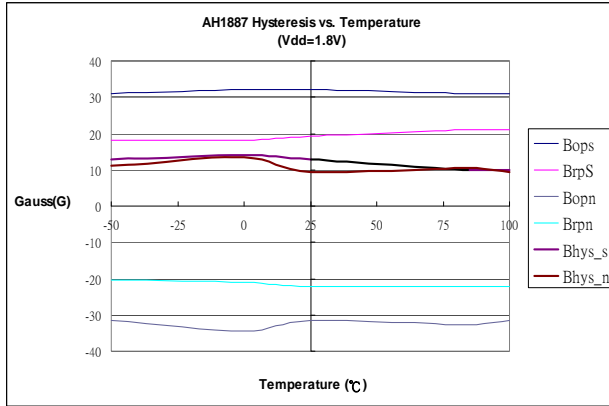
| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------------------------------|----------------|-----|------|-----|-------|
| Bops(south pole to brand side) | Operate Point | - | 35 | 50 | Gauss |
| Bopn(north pole to brand side) | | -50 | -35 | - | |
| Brps(south pole to brand side) | Release Point | 6 | 20 | - | |
| Brpn(north pole to brand side) | | - | -20 | -6 | |
| $B_{hy}(B_{opx} - B_{rpx})$ | Hysteresis | 3 | 15 | - | |

- Notes:
- Typical data is at $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$, and for design information only.
 - Bops & Brps for Output 1 responds to South pole; Bopn & Brpn for Output 2 responds to North pole.
 - The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

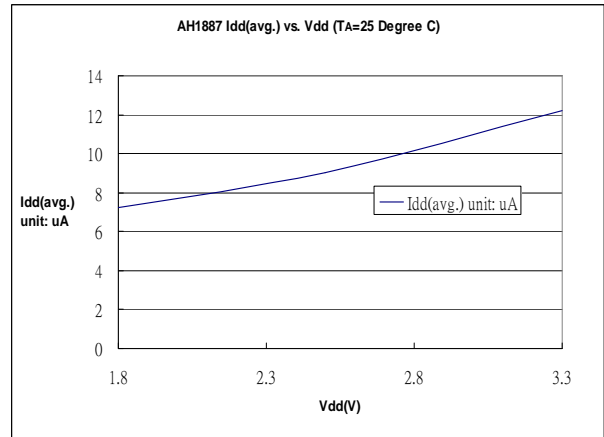
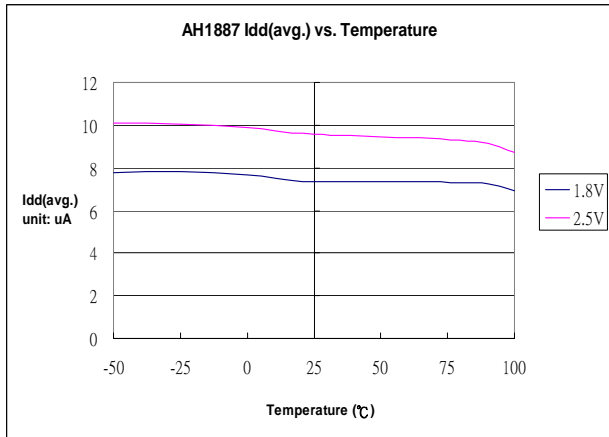


Typical Operating Characteristics

Switching Point

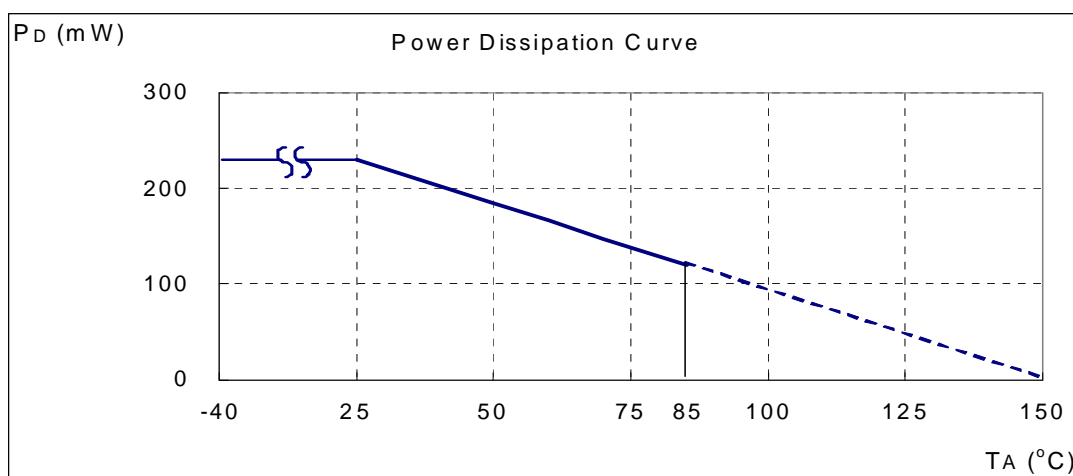


Supply Current

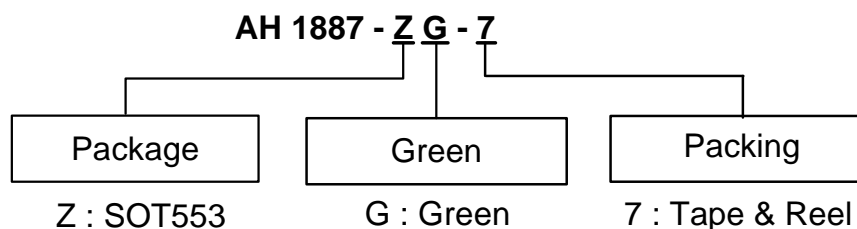


Performance Characteristics

| 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 |



Ordering Information



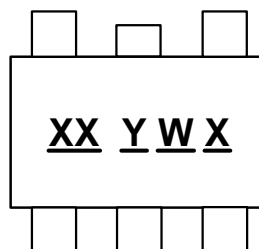
| Device | Package Code | Packaging (Note 5 & 6) | 7" Tape and Reel | |
|-------------|--------------|------------------------|------------------|--------------------|
| | | | Quantity | Part Number Suffix |
| AH1887-ZG-7 | Z | SOT553 | 3000/Tape & Reel | -7 |

- Notes:
5. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.
 6. 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>.

Marking Information

(1) SOT553

(Top View)

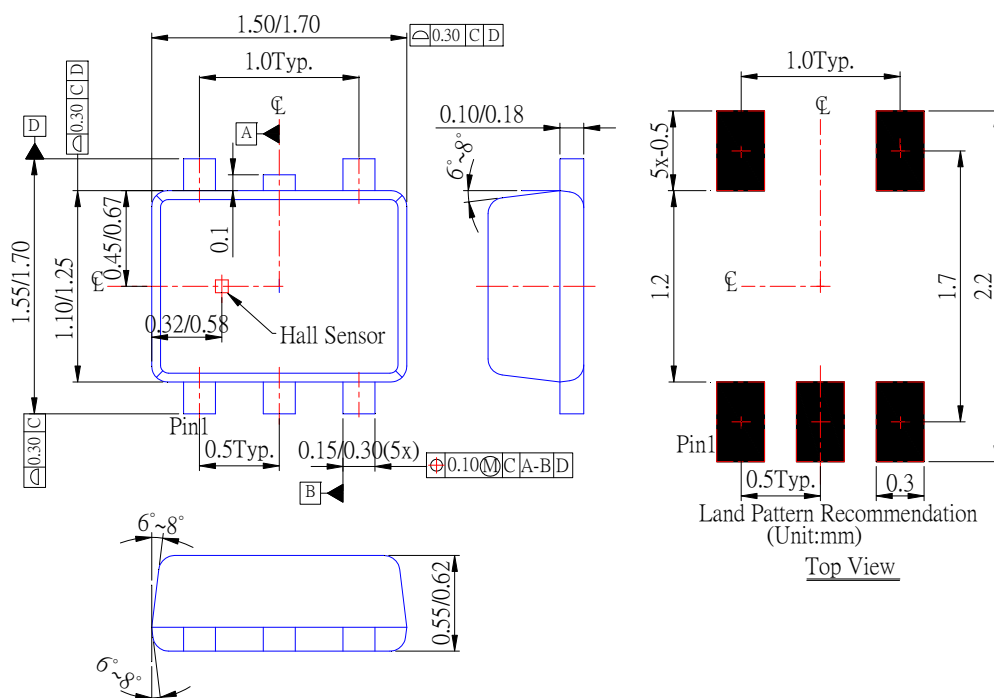


XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
X : A~Z : Green

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH1887 | SOT553 | KU |

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT553



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