AH1887

MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH

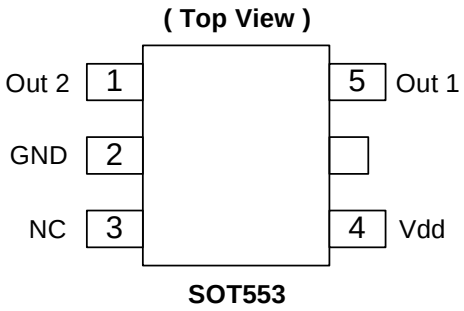
Description

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).

Pin Assignments



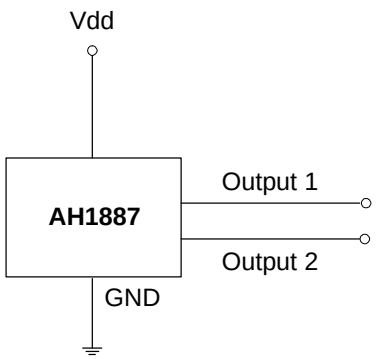
Features

- 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

Applications

- Cellular phone
- PDA
- Cordless phone

Typical Application Circuit

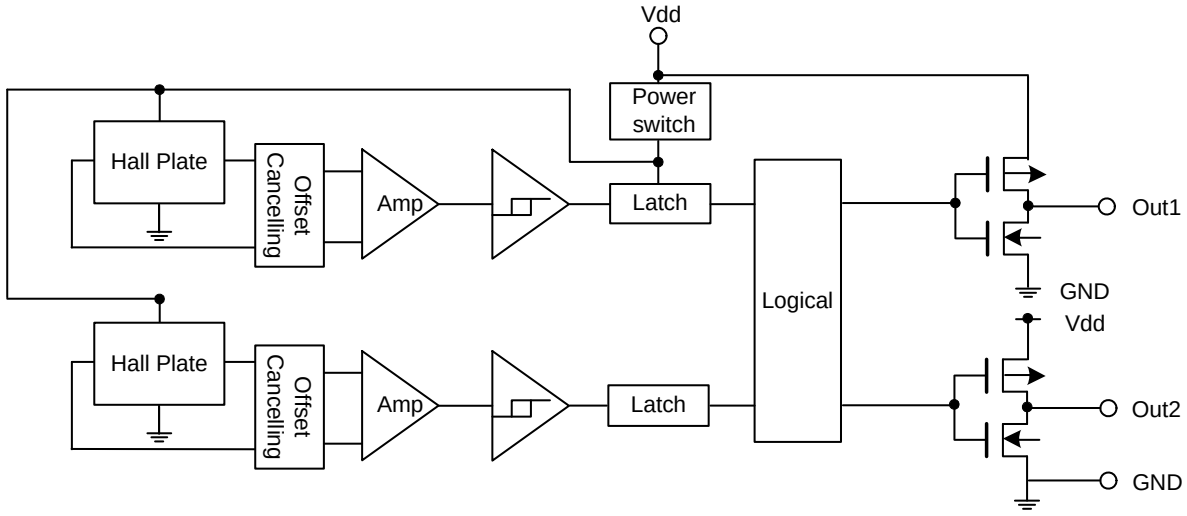


Pin Descriptions

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
Vdd	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
Vdd	Supply Voltage	Operating	1.65 to 3.3	V
T_A	Operating Temperature Range	Operating	-40 to +85	°C

Electrical Characteristics (T_A = 25°C, Vdd = 1.8V, unless otherwise specified)

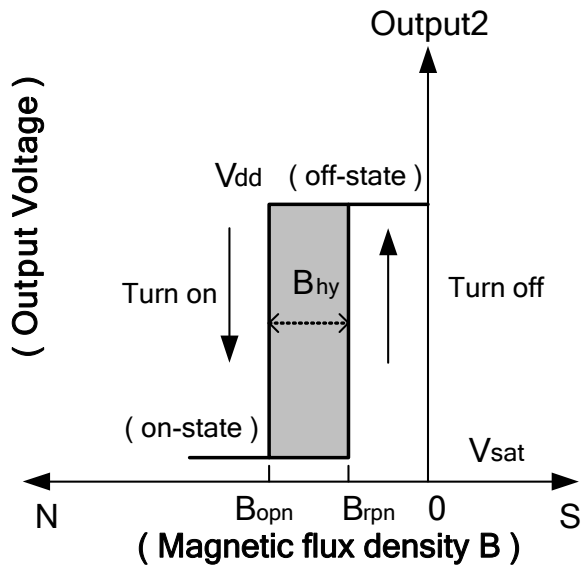
Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
V_{OH}	Output On Voltage (High side)	I_O= -0.5mA	Vdd-0.2	-	-	V
V_{OL}	Output On Voltage (Low side)	I_O= 0.5mA	-	-	0.2	V
Idd(en)	Supply Current	Chip enable	-	2	4	mA
Idd(dis)		Chip disable	-	5	8	uA
Idd(avg)		average supply current	-	7	12	uA
Tawake	Awake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

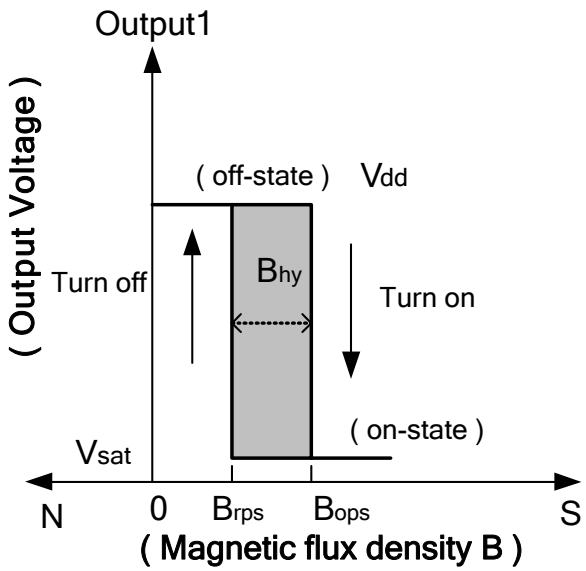
Magnetic Characteristics (T_A = 25°C, Vdd = 1.8V~3.0V, Note 2, 3, 4)

(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	
Bhy(|Bopx|-|Brpx|)	Hysteresis	3	15	-	

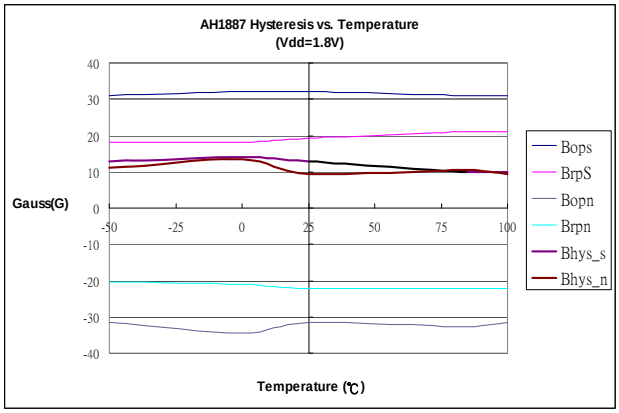
Notes: 2. Typical data is at Ta = 25°C, Vdd = 3V, and for design information only.
3. Bops & Brps for Output 1 responds to South pole; Bopn & Brpn for Output 2 responds to North pole.
4. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

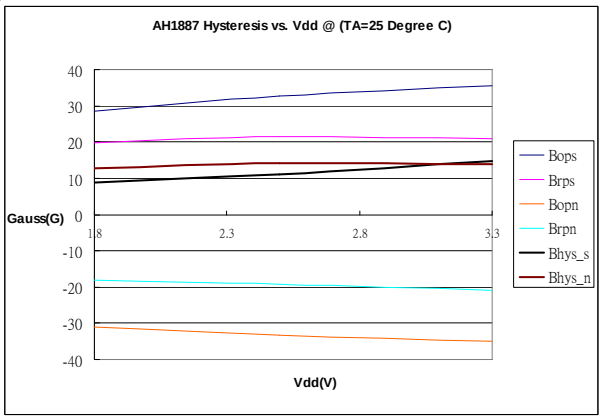




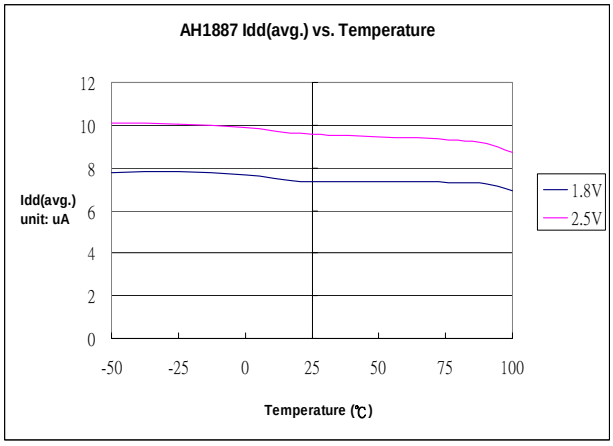
Typical Operating Characteristics

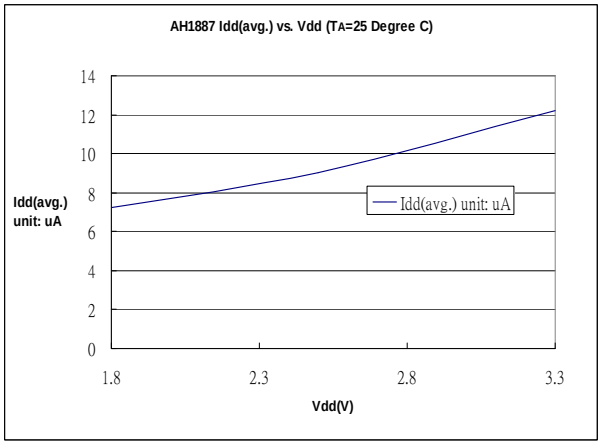
Switching Point





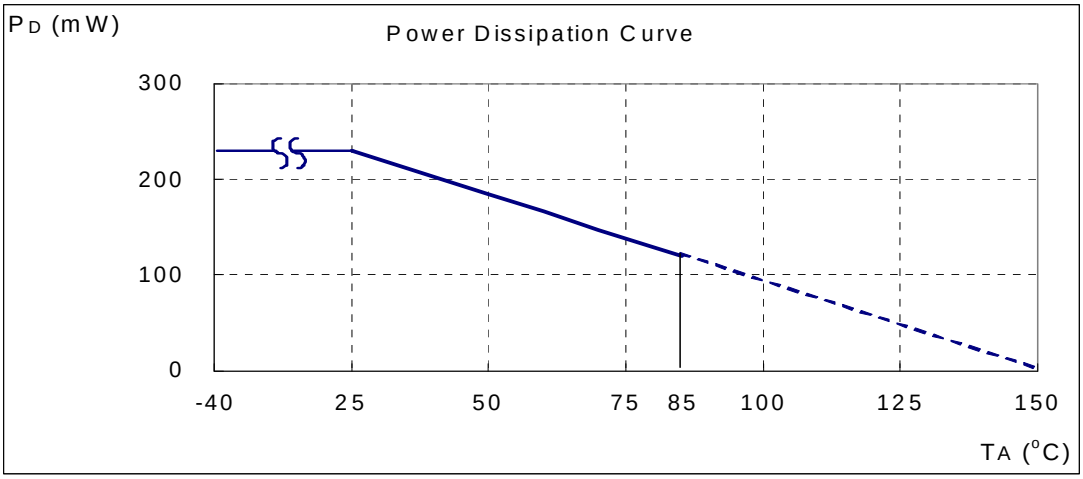
Supply Current



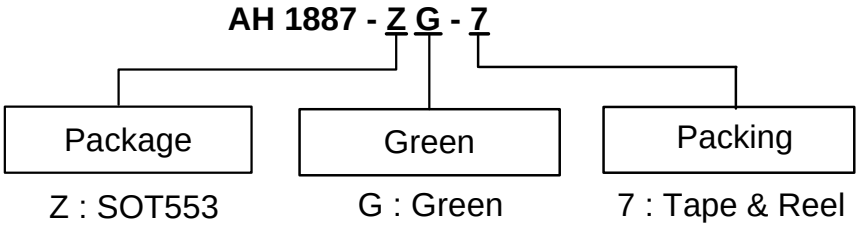


Performance Characteristics

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



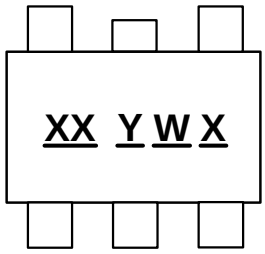
Device	Package Code	Packaging (Note 5 & 6)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1887-ZG-7	Z	SOT553	3000/Tape & Reel	-7

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)

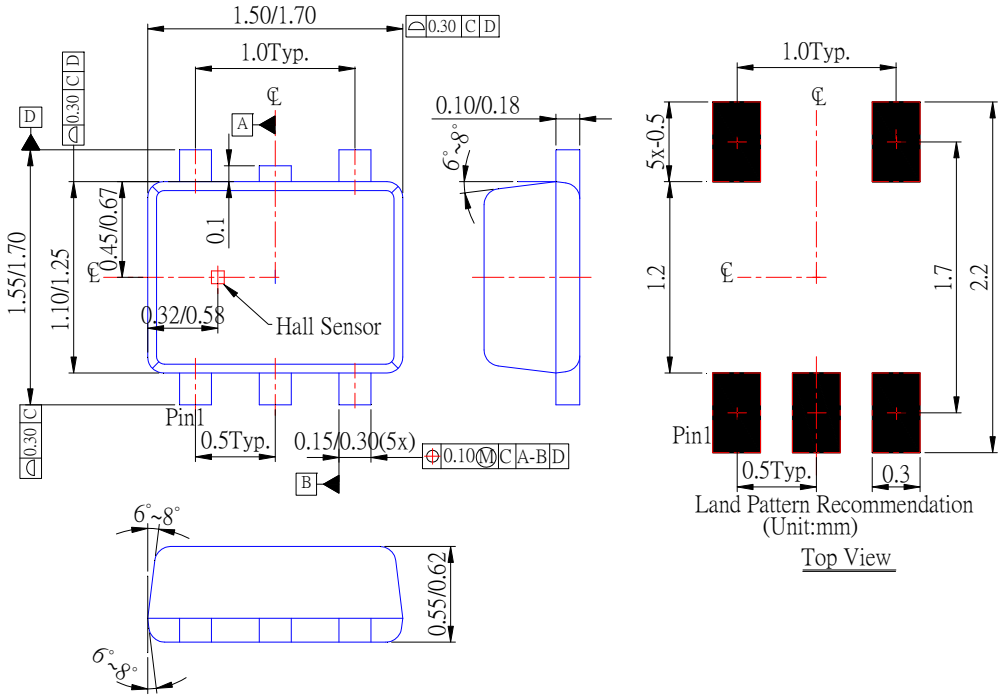


XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week;
z represents 52 and 53 week
X : A~Z : Green

Part Number	Package	Identification Code
AH1887	SOT553	KU

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT553



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