AH1891

MINIATURE MICROPOWER OMNIPOLAR HALL EFFECT SWITCH

NEW PRODUCT

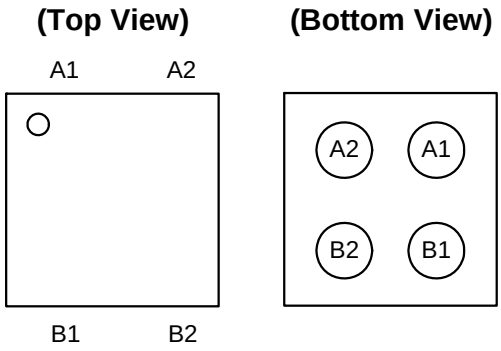
Description

The AH1891 is a miniature micropower Omnipolar Hall effect switch IC with dual outputs specifically designed for portable and battery powered equipment such as cellular phones and portable PCs. To support battery powered equipment the AH1891 has been optimized to operate over the supply range of 1.8V to 3.3V and uses a sleep function to give an average supply current of only 7uA. To minimize PCB space the AH1891 is packaged in the small CSP package (0.8mmx0.8mm) and the design integrates the external pull up resistors to simplify the applications circuit.

The outputs of the AH1891 are switched with either a North or South pole of sufficient strength. When the magnetic flux density **(B)** is larger than operate point **(Bop)**, Output 1 will pull low and Output 2 will be inverted (high). The output states are held until **B** is lower than release point **(Brp).**

The AH1891 is available in U-WLB0808-4 package.

Pin Assignments



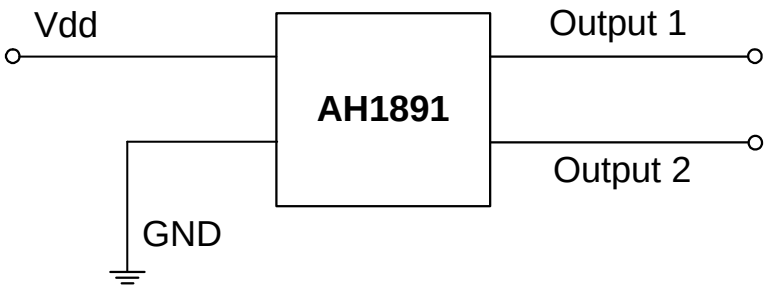
Features

- Omnipolar (North or South) operation
- Low supply voltage of 1.8V to 3.3V
- Micropower operation
- Dual outputs for design flexibility
- Internal pull up and pull down capability
- Chopper stabilized design for:
  - o Superior temperature stability
  - o Superior temperature stability
  - o Superior temperature stability
- Good RF noise immunity
- -40°C to 85°C Operating Temperature
- ESD ＞ 4KV in Human Body Mode
- Miniature CSP package 0.8mm x 0.8mm

Applications

- Cellular phones
- Portable PCs and PDAs
- Digital cameras
- Portable and battery powered applications

Typical Application Circuit



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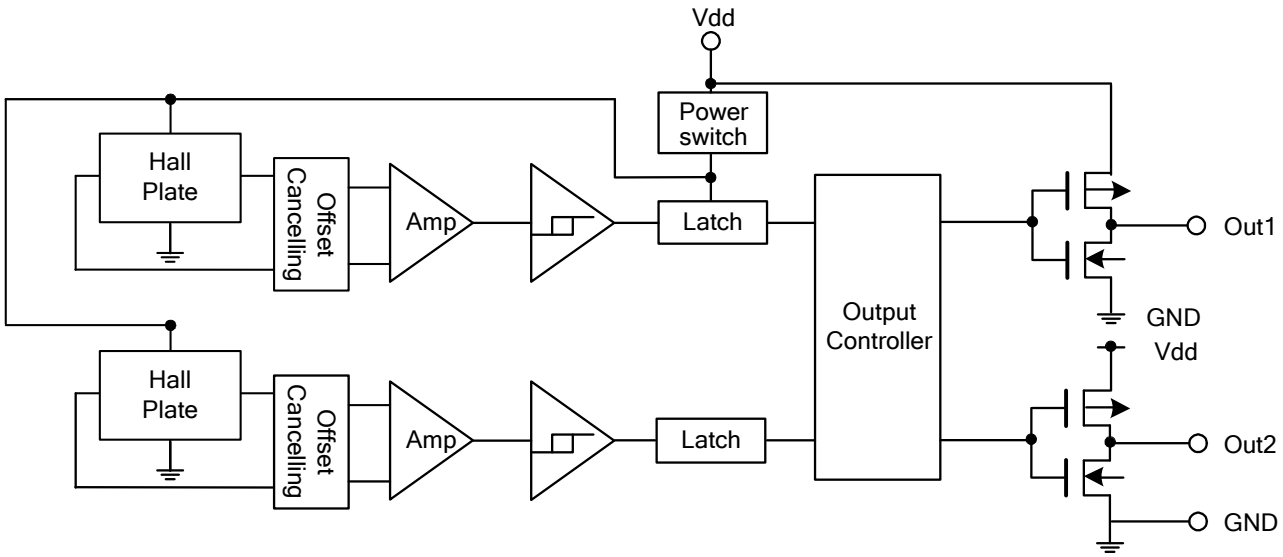
Pin Descriptions

Pin #	Pin Name	Description
A1	Out 1	Output Pin (active low)
A2	Out 2	Output Pin (active high)
B1	GND	Ground
B2	Vdd	Power Supply Voltage

Functional Block Diagram



Absolute Maximum Ratings (T_A = 25°C)

Symbol	Parameter	Values	Unit
Vdd	Supply voltage	5	V
B	Magnetic flux density	Unlimited	
T_A	Operating Temperature Range	-40 to +85	°C
Ts	Storage Temperature Range	-65 to +150	°C
P_D	Package Power Dissipation	166	mW
T_J	Maximum Junction Temperature	150	°C

Recommended Operating Conditions (T_A = 25°C)

Symbol	Parameter	Conditions	Rating	Unit
Vdd	Supply Voltage	Operating	1.8 to 3.3	V

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

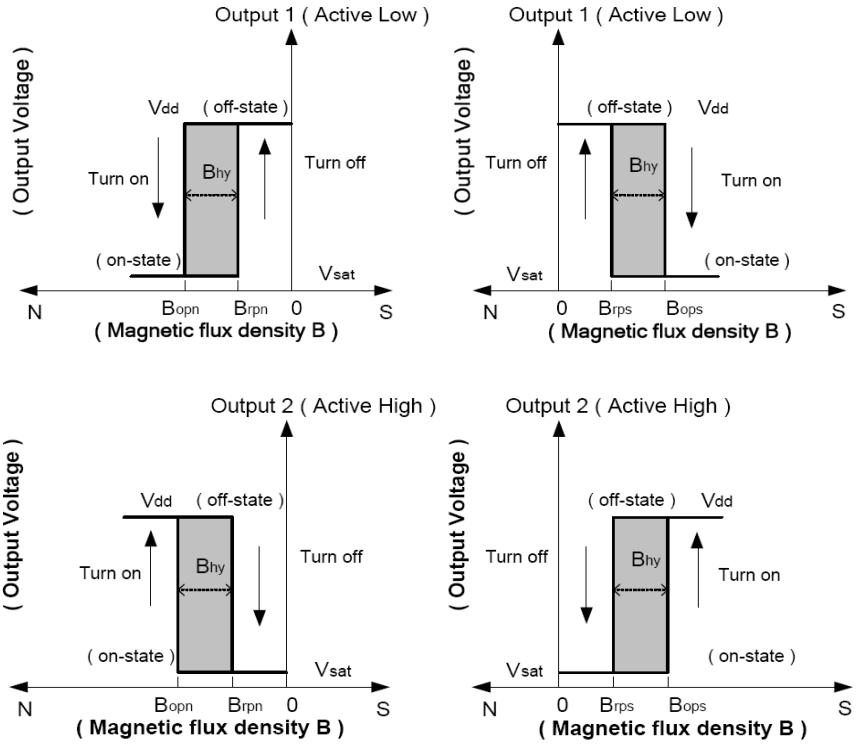
Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V_{OH}	Output On Voltage (High side)	I_O= -0.5mA	Vdd-0.2	-	-	V
V_{OL}	Output On Voltage (Low side)	I_O= 0.5mA	-	-	0.2	V
Ioff	Output Leakage Current	Output off	-	<0.1	1	μA
Idd(en)	Supply Current	Chip enable	-	2	4	mA
Idd(dis)		Chip disable	-	5	8	uA
Idd(avg)		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~3.3V, Note 1)

(1mT=10 Gauss)

Symbol	Parameter (Note 2)	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operate Point	20	40	60	Gauss
Bopn(north pole to brand side)		-60	-40	-20	
Brps(south pole to brand side)	Release Point	12	25	50	
Brpn(north pole to brand side)		-50	-25	-12	
Bhy(|Bopx|-|Brpx|)	Hysteresis		15		

Notes: 1. Typical data is at T_A = 25°C, Vdd = 3V, and for design information only.
2. Operate point and release point will vary with supply voltage and operating temperature.



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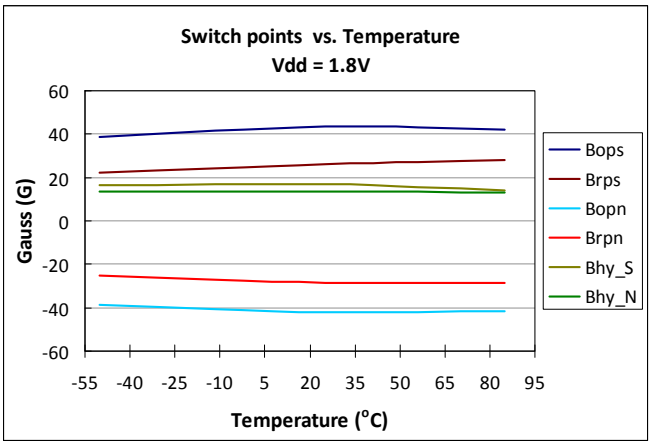
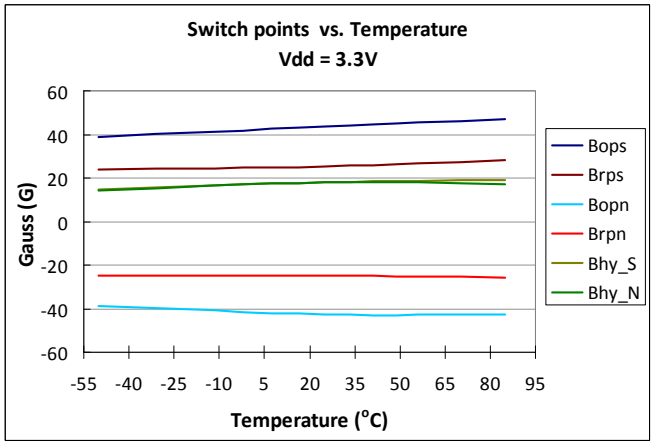
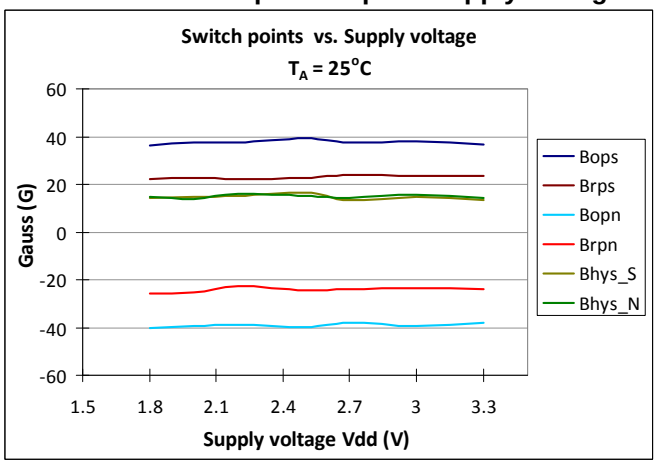
Typical Operating Characteristics

Switch Points Bop and Brp vs. Temperature

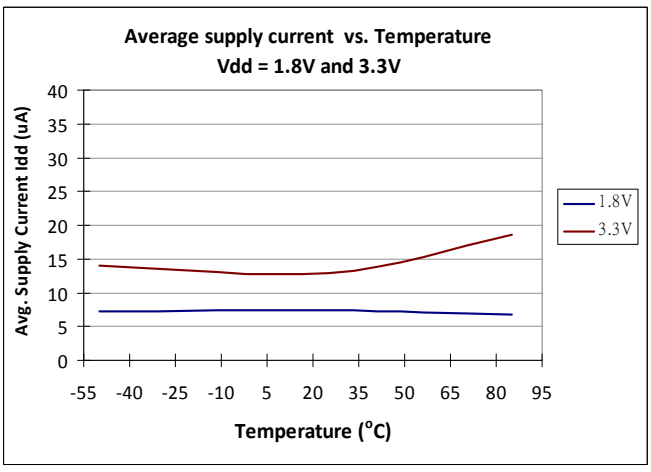




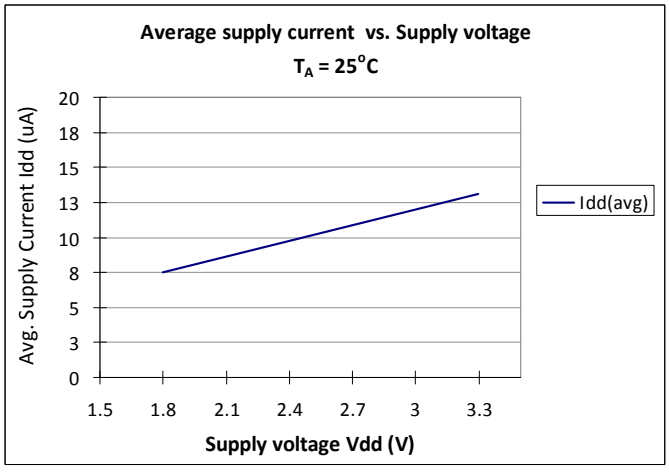
Switch Points Bop and Brp vs. Supply Voltage



Average Supply Current vs. Temperature



Average Supply Current vs. Supply Voltage



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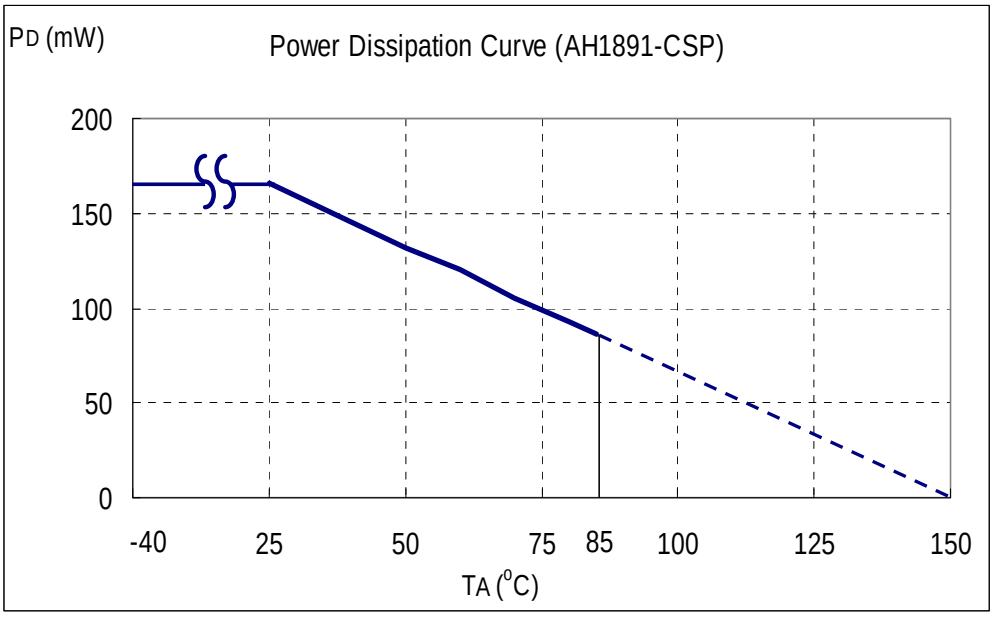
Performance Characteristics

(1) U-WLB0808-4

T_A (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P_D (mW)	166	132	120	105	93	86	79	66	53	39	26	13	0



Ordering Information

AH1891 - CA4 - 7

Package	Packing
U-WLB0808-4	7 : Tape & Reel

Device (Note 3)	Package Code	Packaging (Note 4)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1891-CA4-7	CA4	U-WLB0808-4	3000/Tape & Reel	-7

Notes: 3. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.
4. 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.

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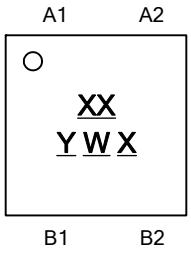
Marking Information

(1) U-WLB0808-4

(Top View)

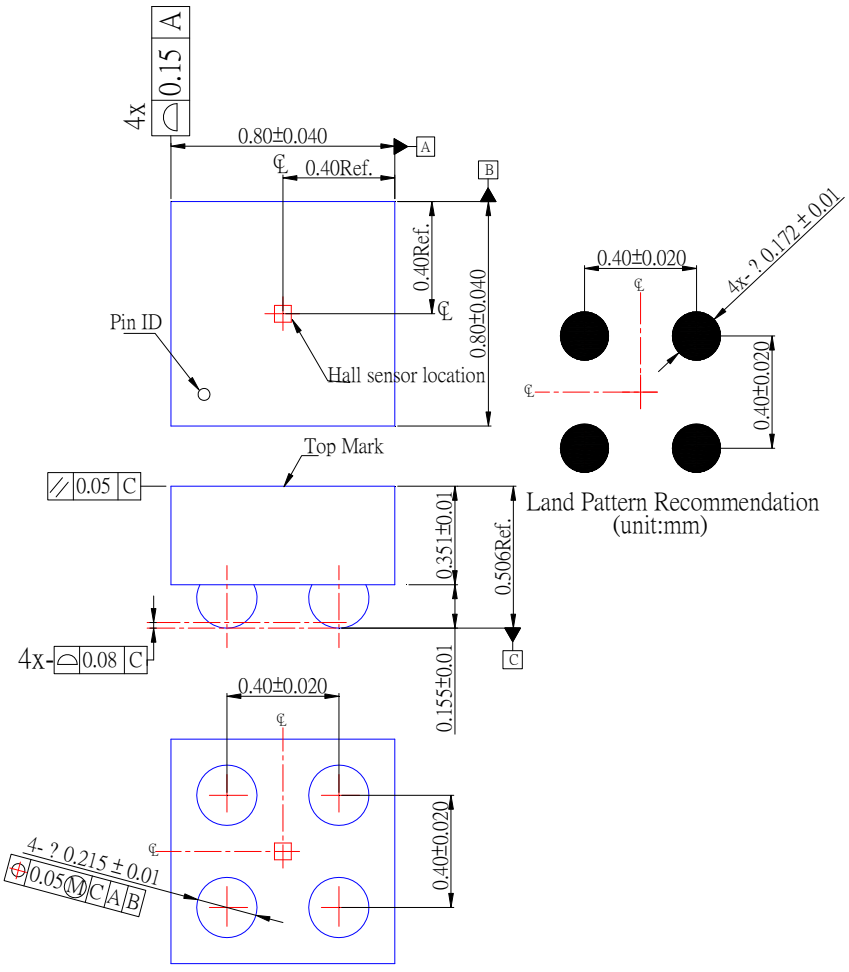


XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Internal Code

Part Number	Package	Identification Code
AH1891-CA4-7	U-WLB0808-4	A2

Package Outline Dimensions (All Dimensions in mm)

(1) Package type: U-WLB0808-4



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