

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 is 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 7 μ A. 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.

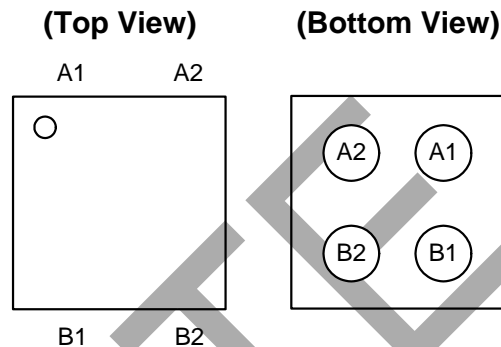
The outputs of the AH1891 are switched with either a North or South pole of sufficient strength. When the magnetic flux density (B) is larger than operate point (Bop), Output 1 will pull low and Output 2 will be inverted (high). The output states are held until B is lower than release point (Brp).

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

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:
 - Superior temperature stability
 - Superior temperature stability
 - 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

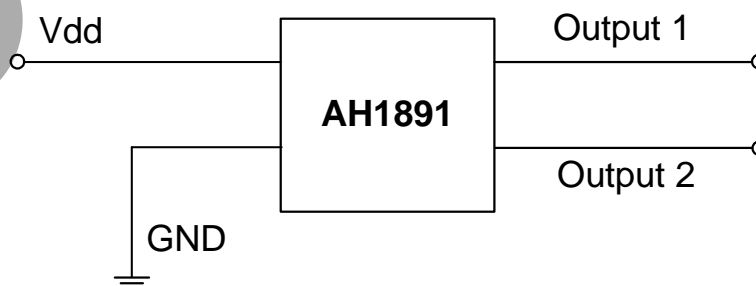
Pin Assignments



Applications

- Cellular Phones
- Portable PCs and PDAs
- Digital Cameras
- Portable and Battery Powered Applications

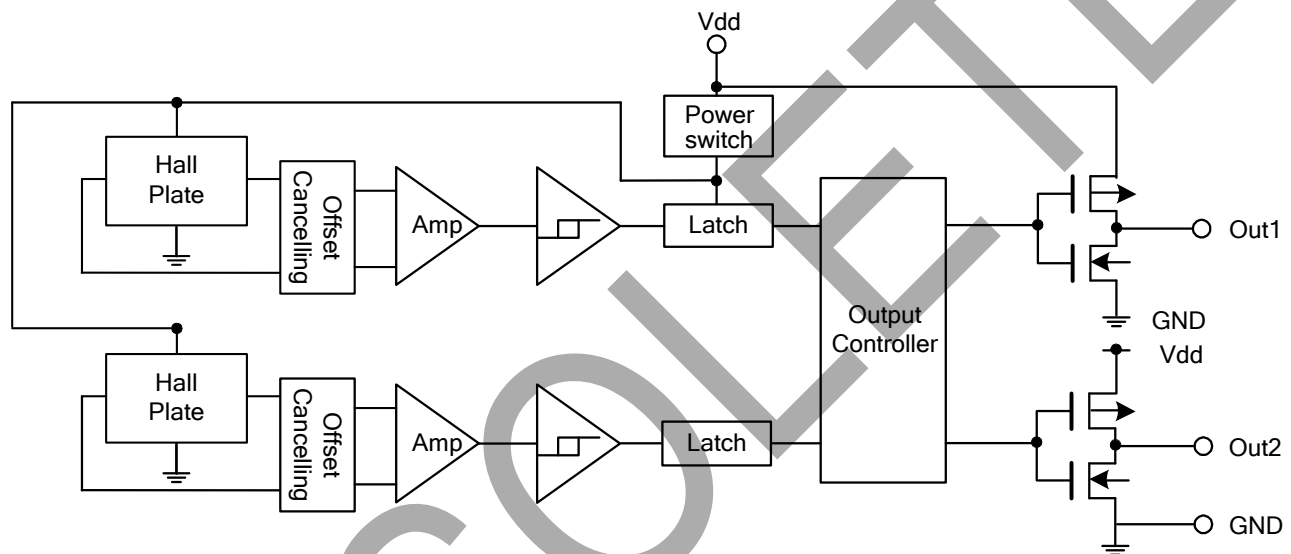
Typical Application Circuit



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

Symbol	Parameter	Values	Unit
Vdd	Supply voltage	5	V
B	Magnetic flux density	Unlimited	
T_A	Operating Temperature Range	-40 to +85	$^\circ\text{C}$
T_S	Storage Temperature Range	-65 to +150	$^\circ\text{C}$
P_D	Package Power Dissipation	166	mW
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$

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

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

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

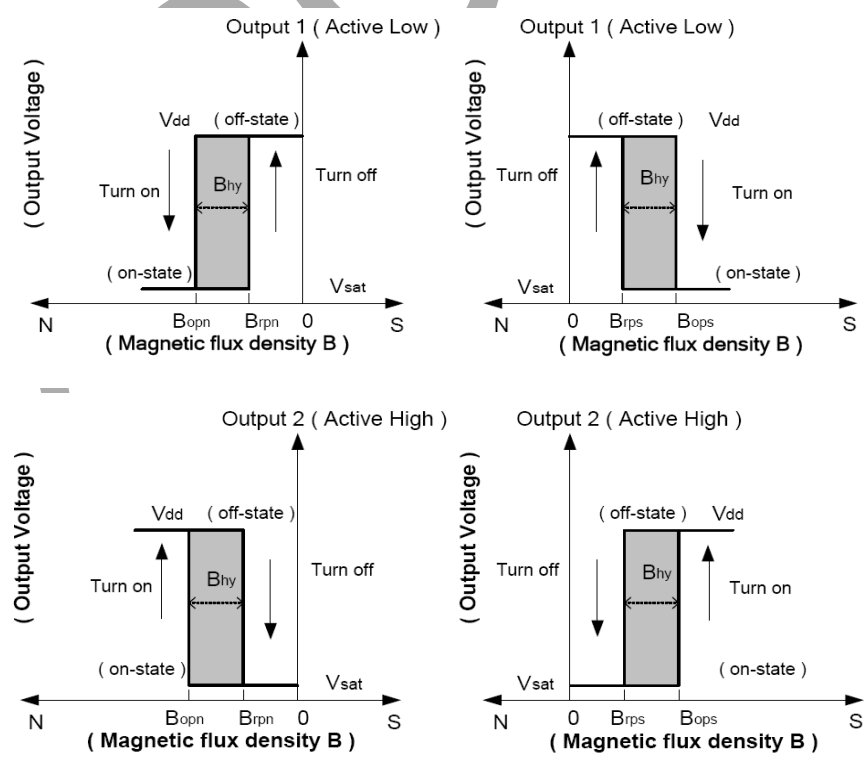
Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V_{OH}	Output On Voltage (High side)	$I_{O} = -0.5\text{mA}$	$V_{dd}-0.2$	-	-	V
V_{OL}	Output On Voltage (Low side)	$I_{O} = 0.5\text{mA}$	-	-	0.2	V
I_{off}	Output Leakage Current	Output off	-	<0.1	1	μA
$I_{dd(en)}$	Supply Current	Chip enable	-	2	4	mA
$I_{dd(dis)}$		Chip disable	-	5	8	μA
$I_{dd(avg)}$		Average supply current	-	7	12	μA
T_{awake}	Awake Time	-	-	50	100	μs
T_{period}	Period	-	-	50	100	ms
D.C.	Duty Cycle	-	-	0.1	-	%

Magnetic Characteristics ($T_A = 25^\circ\text{C}$, $V_{dd} = 1.8\text{V}-3.3\text{V}$, Note 1)

(1mT=10 Gauss)

Symbol	Parameter (Note 2)	Min	Typ.	Max	Unit
B_{ops} (south pole to brand side)	Operate Point	20	40	60	Gauss
B_{opn} (north pole to brand side)		-60	-40	-20	
B_{rps} (south pole to brand side)	Release Point	12	25	50	
B_{rpn} (north pole to brand side)		-50	-25	-12	
$B_{hy}(B_{opx} - B_{rpx})$	Hysteresis	-	15	-	

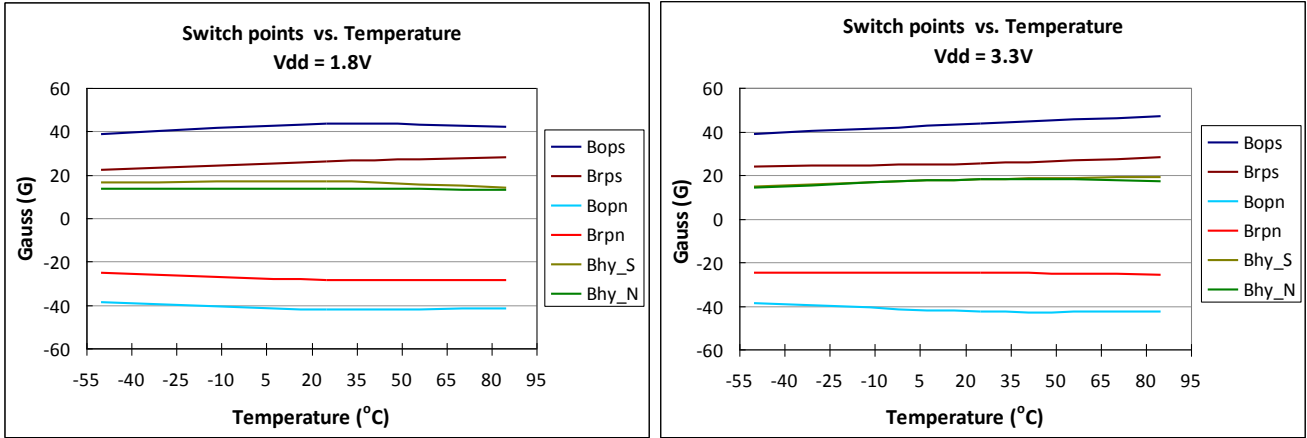
- Notes: 1. Typical data is at $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$, and for design information only.
2. Operate point and release point will vary with supply voltage and operating temperature.



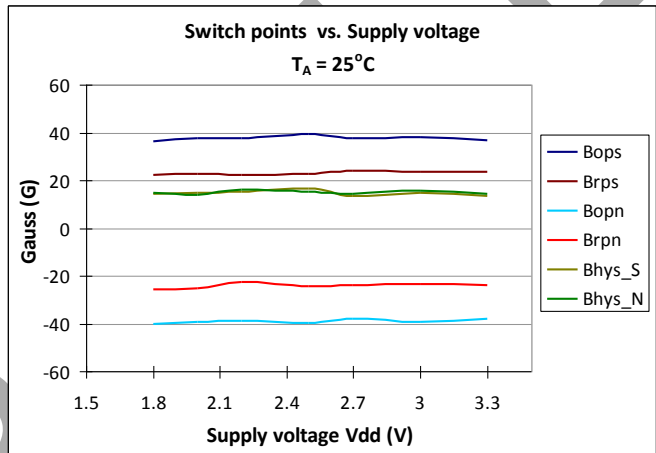
OBSOLETE - PART DISCONTINUED

Typical Operating Characteristics

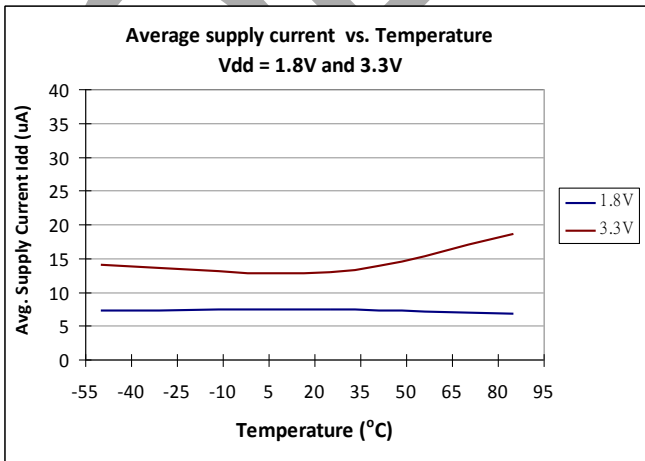
Switch Points Bop and Brp vs. Temperature



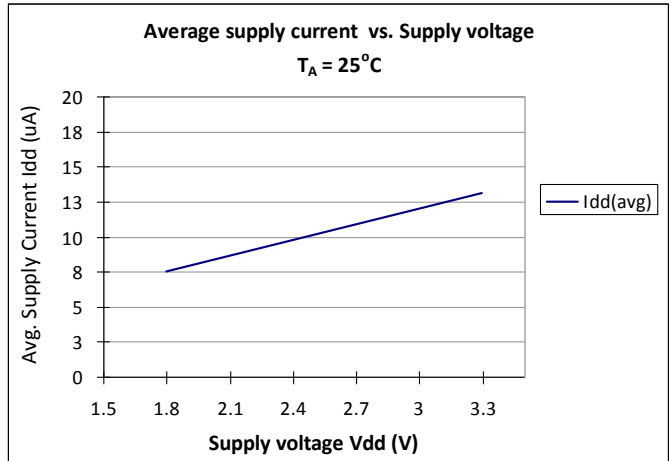
Switch Points Bop and Brp vs. Supply Voltage



Average Supply Current vs. Temperature



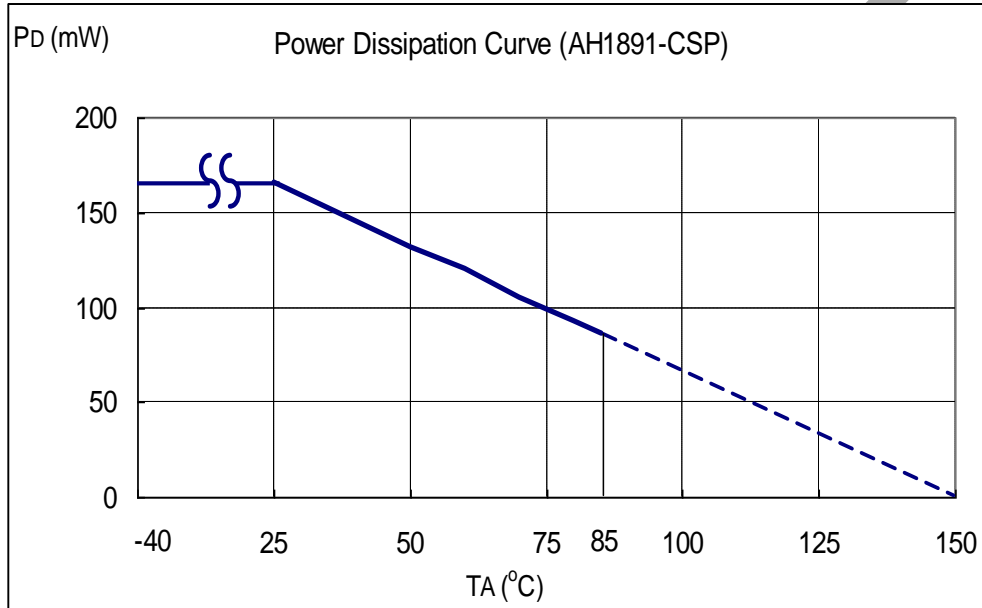
Average Supply Current vs. Supply Voltage



Performance Characteristics

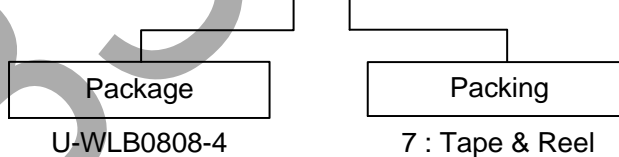
(1) U-WLB0808-4

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



Device (Note 3)	Package Code	Packaging (Note 4)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1891-CA4-7	CA4	U-WLB0808-4	3,000/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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