



New Product Announcement

AH1902/AH1903

AH1902/AH1903 - Micropower Hall Switches

The AH1902 and AH1903 are low voltage high performance micropower Omnipolar and programmable Unipolar/Omnipolar function Hall-Effect switch ICs.

They are designed for consumer equipment ranging from portable and battery powered to home appliances and industrial applications.

The AH190x family extends the solution options and flexibility provided by AH189x, AH1812 and AH3360 family of Omnipolar and Unipolar devices.

Although designed for variety of applications, they are optimized to operate over the supply range of 1.6V to 3.6V and consumes an average current of 4.3uA typical at 1.8V.

Based on chopper stabilized architecture and a ESD rating of 8kV they provides a reliable and robust solution over the whole operating range.

To help achieve the small solution and to minimize component placement, the devices have internal push-pull output structure and are available in the small low profile X1-DFN1216 package. The AH1902 is also in available in thin X2-DFN2015-6 packages.



The Diodes Advantage

The AH1902 and Ah1903 provide a small, simple and flexible contactless switch solution for multiple applications.

▪ **Omnipolars/Unipolar function and operating switch point options**

- Programmable Unipolar/Omnipolar AH1903: Operates with a South pole to the part marking surface in Unipolar mode. Operates with either North or South pole in Omnipolar mode.
- Omnipolar AH1902 : Operates with either a North or South pole
- Internal push-pull output structure - No external pull-up required- Minimal external component

▪ **Designed for portable battery powered equipment, home appliances and industrial applications**

- Supply voltage optimized to 1.6V to 3.6V to support battery applications
- Micropower operation with an average supply current of 4.3uA at 1.85V

▪ **High performance and reliability**

- Tight operating window (less magnetic spread)
- Chopper stabilized design to provide minimal switch point drift and superior temperature stability
- Operating temperature range -40°C to 85°C
- High ESD rating of 8kV for VDD, GND and Output pins. (Logic SEL pin in AH1903 is 6kV)

▪ **Small solution in low profile or industry standard packages**

- Small low profile X1-DFN1216 (1.2mm x 1.6mm x 0.5mm)
- Ultra thin X2-DFN2015-6 (2mm x 1.5mm x 0.39mm) max height 0.4mm

Applications

- Tablets, E-Readers and ultrabooks,
- Cellphones slide/flip and smart cover
- Handheld game consoles
- Home appliances and industrial contactless switches
- Safety and security

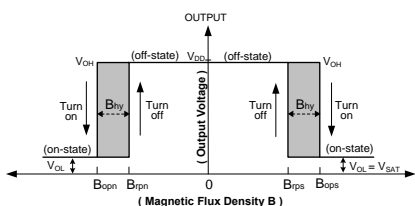
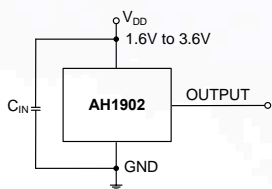


New Product Announcement

AH1902/AH1903

Typical Applications Circuit

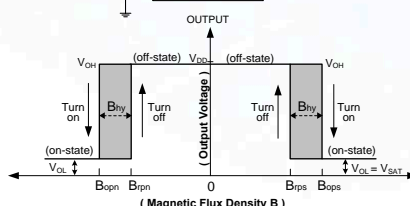
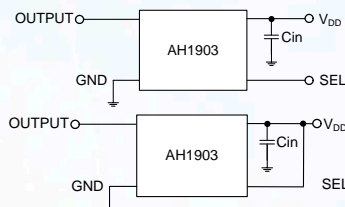
AH1902 Omnipolar



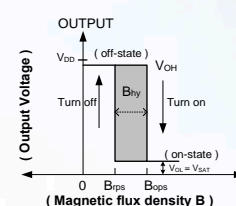
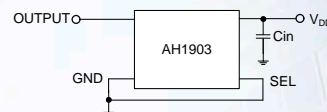
Programmable AH1903:

SEL: Open or pull high Unipolar mode
SEL: Pull low for Omnipolar mode

AH1903 in Omnipolar mode



AH1903 in Unipolar mode



Note: Cin is for power stabilization and to strengthen the noise immunity, C = 100nF or higher must be used.

Electrical Characteristics

Part Number	Function	Output Type	Operating Voltage (V)	Average Supply Current (uA)	Chopper Stabilized	ESD	Max. Operating Point (Bop) (Gauss)	Min Release Point (Brp) (Gauss)	Temp Range (°C)	Package Outlines
AH1902-FA-7	Omnipolar	Single Push-pull	1.6 to 3.6	4.3	Yes	8kV	±47	±13	-40 to 85	X1-DFN1216-4
AH1902-FT4-7										X2-DFN2015-6
AH1903-FA-7	Programmable, Unipolar mode	Single Push-pull	1.6 to 3.6	4.3	Yes	8kV ⁽¹⁾	47	13	-40 to 85	X1-DFN1216-4
	Programmable, Omnipolar mode						±47	±13		

⁽¹⁾ ESD rating of AH1903: V_{DD}, OUTPUT and GND pins: 8kV; Logic SEL pin: 6kV,

Ordering Information

Device	Packaging ⁽⁴⁾	Part mark ID	Reel size	Tape width	Quantity
AH1902-FA-7	X1-DFN1216-4	F2	7"	8mm	3000
AH1902-FT4-7	X1-DFN1216-4	D2	7"	8mm	3000
AH1903-FA-7	X1-DFN1216-4	F3	7"	8mm	3000

⁽³⁾ SOT553 for AH1902 will be available later in the year

⁽⁴⁾ "Green" mold compound with Lead Free Finish/RoHS Compliant packages.

EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free. Please visit our website at http://www.diodes.com/products/lead_free.html.



New Product Announcement

AH1902/AH1903

Product Portfolio – Omnipolar Hall Effect Switches

Part	Output	Output Type	Operating Voltage (V)	Average Supply Current (µA)	Operating Point Bop (Gauss)			Release Point Brp (Gauss)			Temp Range (°C)	Package
					Min	Typ	Max	Min	Typ	Max		
					AH180	Single	Open Drain	2.5 to 5.5	8	-60		
AH180N	Single	Open Drain	2.5 to 5.5	8	-50	35	50	10	25	-10	-40 to +85	SOT553, TSOT23, SC59
AH1801	Single	Open-Drain	2.5 to 5.5	8	-60	40	60	10	30	-10	-40 to +85	DFN2020-3, DFN2020-6, SC59
AH1802	Single	Open Drain	2.5 to 5.5	8	20	28	40	10	20	-10	-40 to +85	DFN2015H4, DFN2020-3, DFN2020-6, SC59
AH1803	Single	Open Drain	2.5 to 5.5	8	20	28	40	10	20	-10	-40 to +85	DFN2020-6, SC59
AH1804	Single	Push-Pull	2.5 to 3.6	12	20	40	60	15	32	-15	-40 to +85	DFN1216, SC59
AH9247	Single	Int. Pull-up	2.5 to 5.5	10	0	30	55	5	20	-5	40 to +85	SOT23, DFN2020-3, SIP3
AH9248	Single	Open Drain	2.5 to 5.5	10	0	30	55	5	20	-5	40 to +85	DFN2020-3, SIP3
AH1806	Single	Open-Drain	2.5 to 3.6	8	15	30	45	10	20	40	-40 to +85	SC59 SOT553
AH1808	Single	Open Drain	2.5 to 3.6	8	20	40	60	10	30	50	-40 to +85	SC59, SOT553
AH1807	Single	Open Drain	2.5 to 5.5	8	50	80	115	40	65	100	-40 to +125	SC59, SOT553, SIP-3
AH1809	Single	Open Drain	2.5 to 5.5	8	90	130	185	80	115	170	-40 to +125	SC59, SOT553, SIP-3
AH1883	Single	Push-Pull	1.65 to 3.3	7	-55	37	55	6	29	-6	-40 to +85	SOT553, U-DFN2020-3
AH1884	Dual, Compl	Push-Pull	1.65 to 3.3	7	-55	37	55	15	29	-15	-40 to +85	SOT553
AH1886	Dual, Compl	Push-Pull	1.65 to 3.3	7	18	37	59	6	29	-6	-40 to +85	SOT553
AH1886	Dual, Compl	Push-Pull	1.65 to 3.3	7	18	37	59	15	29	-15	-40 to +85	SOT553
AH1888	Dual, Compl	Push-Pull	1.65 to 3.3	7	-79	61	79	35	53	-35	-40 to +85	SOT553, DFN2020-3
AH1891	Dual, Compl	Push-Pull	1.8 to 3.3	7	20	40	60	12	25	50	-40 to +85	U-WLB0808-4 (CSP)
AH1812	Single	Push-Pull	1.6 to 3.6	4.3	16	30	40	11	20	35	-40 to +85	X1-DFN1216-4
AH1892	Single Prog.	Push-Pull	1.6 to 3.6	4.3	LB: 18	35	55	12	25	45	-40 to +85	SOT553, X1-WLB0707-4
LB: 55					-35	-18	-45	-25	-12			
AH1898	Single	Push-Pull	1.6 to 3.6	4.3	HB: 43	60	80	35	50	70	-40 to +85	X1-WLB0808-4
HB: 80					-60	-43	-70	-50	-35			
AH1893	Single	Push-Pull	1.6 to 3.6	4.3	14	30	42	9	20	35	-40 to +85	SOT553, X1-DFN1216-4
AH1895	Single	Push-Pull	1.6 to 3.6	4.3	40	60	80	35	50	65	-40 to +85	SOT553, X1-DFN1216-4
AH1897	Single	Push-Pull	1.6 to 3.6	4.3	16	30	40	11	20	35	-40 to +85	X1-DFN1216-4
AH1902	Single	Push-Pull	1.6 to 3.6	4.3	23	33	48	9	23	35	-40 to +85	X1-DFN1216-4 X2-DFN2015-6
AH1903	Single, Prog. Uni/Omni	Push-Pull	1.6 to 3.6	4.3	23	33	48	12	23	35	-40 to +85	X1-DFN1216-4
					-47	-33	-23	-35	-23	-12		
AH1894	Single Prog.	Push-Pull	1.6 to 3.6	4.3	23	33	47	12	23	-12	-40 to +85	SOT553, X1-DFN1216-4
					LB: 18	35	55	12	25	45		
					LB: 55	-35	-18	-45	-25	-12		
					HB: 43	60	80	35	50	70		
					HB: 80	-60	-43	-70	-50	-35		

Prog: Programmable
Uni/Omni: Unipolar/Omnipolar



New Product Announcement

Product Portfolio – Unipolar Hall Effect Switches

Part	Output	Output Type	Operating Voltage	Average Supply Current	Typical Output Current	Grade/ Output	Operating Point Bop			Release Point Brp			Temp Range	Package
			(V)	(uA)	(mA)		(Gauss)			(Gauss)				
							Min	Typ	Max	Min	Typ	Max		
AH182	Single	Open Drain	2.5 to 5.5	5	10		-	40	60	10	30	-	-40 to 85	SC59, SIP-3L
AH183	Single	Open Drain	2.5 to 5.5	280	10		-	40	60	10	30	-	-40 to 85	SC59, SIP-3L
AH337	Single	Open Drain	4.2 to 28	2000	25		90	120	150	30	60	90	-40 to 125	SC59 SIP3
AH922	Single	Open Drain	3.0 to 22.0	3000	25	- B C	80 45 85	110 - -	140 95 135	35 25 65	65 - -	95 75 115	-40 to 125	SOT23, TO-92S
ATS137 ⁽¹⁾	Single	Open Collector	3.5 to 20	5000	25	A B	- -	- -	100 130	10 10	- -	- -	-20 to 85	SC59-3L SIP3-3L
AH1887	Dual (North, South)	Push-pull	1.65 to 3.3	7	1	Output1 Output2	- -50	35 -35	50 -	6 -	20 -20	- -6	-40 to 85	SOT553
AH1889	Dual (North, South)	Push-pull	1.65 to 3.6	5000	1	Output1 Output2	- -50	35 -35	50 -	6 -	20 -20	- -6	-40 to 85	SOT553
AH1903	Single, Prog. Uni/ Omni	Push-pull	1.6 to 3.6	4.3	1		23	33	47	12	23	35	-40 to 85	X1-DFN1216-4
AH3360	Single	Push-pull	1.6 to 3.6	4.3	1		14	30	46	9	20	39	-40 to 85	X1-DFN1216-4 X2-DFN2015-6 SOT553

⁽¹⁾ ATS137: Not recommended for new design

Prog: Programmable
Uni/Omni: Unipolar/Omnipolar

To find out more information:

Omnipolar Portfolio page: <http://www.diodes.com/products/catalog/list.php?parent-id=113>

Unipolar Portfolio page: <http://www.diodes.com/products/catalog/list.php?parent-id=112>

AH1902 Datasheet: <http://www.diodes.com/datasheets/AH1902.pdf>

AH1903 Datasheet: <http://www.diodes.com/datasheets/AH1902.pdf>