



HALL SENSORS



- Omnipolar, Unipolar, Latch, and Linear Hall Sensor Products
- Wide Input Voltage Ranges Support Battery Powered, Industrial, and Automotive Applications
- Ultra-Low Power, Super-Tight Switch Point Distribution and Drift
- Automotive-Compliant Switches Qualified to AEC-Q100 Grade 0

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DIODES' HALL EFFECT SENSORS

Diodes Incorporated offers a comprehensive product line for detecting and responding to changes in magnetic fields in consumer, industrial, and automotive applications.

Combining its superior Hall effect technology, extensive analog design expertise, leading package technology, and manufacturing capability, Diodes can offer the outstanding system solutions across numerous applications.

Hall Effect Switch ICs

Hall effect switch ICs provide simple and reliable solutions to contactless switching. They are used in many application areas from open and close detection to rotation and flow monitoring. Using core architectures based on a stable patented Hall effect plate design,

Diodes provides three comprehensive Hall effect switch product families:

- Omnipolar
- Unipolar
- Latch

The Diodes' Hall effect switch portfolio is well suited to meeting the requirements of:

- Cell Phones
- Portable PCs
- Still and Video Cameras
- Metering
- Motor Commutation
- Rotation Detection
- Level Detection
- Contactless Switching
- Automotive
- Home Appliances

The new automotive-compliant sensor switches offer superior switching point performance—overvoltage and temperature—with class-leading robustness.

Linear Hall Sensors

Diodes' linear Hall sensors provide high linearity outputs whose voltage is proportional to the applied magnetic flux density. They provide a simple compact solution to wide range of analog magnetic flux/field sensing/position detection in consumer and industrial applications.

All the Diodes' Hall effect sensors are designed with the end application in mind, enabling highly effective system solutions through wide operating ranges, various operate and release points, and ultra-small and low-profile packaging.

UNIPOLAR HALL SENSOR SWITCHES



THE DIODES ADVANTAGE

High-Performance Automotive and Industrial Unipolar Hall Switches

- Ten sensitivity options with good tolerance and low magnetic spread with low temperature coefficients for switch points
- Magnetic characteristics specified over the whole operating range
- Fast "power on" (10µs) and response time (3.75µs) with wide bandwidth

Product Flexibility

- Designed for a wide range of applications: 1.6V to 28V and -40°C to +150°C
- Open-drain output for pullup flexibility or internal pullup for reduced components
- SOT23, SC59 (opposite polarity Bop to SOT23) and SIP-3 packages

Reliability and Robustness

- Input and output clamps with output current limit (AH33 series)
- Reverse voltage protection (32V on automotive-compliant Q-parts)

Part Number	Output Type	Operating Voltage Range (V)	I _{DD} Typical	Min Bop (gauss)	Typ Bop (gauss)	Max Bop (gauss)	Min Brp (gauss)	Typ Brp (gauss)	Max Brp (gauss)	Typical Hysteresis B _{hys} (gauss)	Features	Packages
AH1389	Push Pull	1.6 to 3.6	4.3µA	13	25	39	9	20	37	5	Dual Output	X2-DFN1410-4
AH1903				21	33	48	9	23	38	10	Selective Uni or Omnipolar	SOT553, X1-DFN1216-4
AH1390				1.3µA	6	17	25	2	11	20	6	Dual Output
AH3372	Open Drain	3 to 28	3mA	15	30	45	5	20	35	10	Reverse Blocking, Overcurrent Protection, Overvoltage Clamp	SC59, SOT23, SIP-3
AH3373				38	55	72	20	35	50	20		
AH3382	Pullup Resistor			40	55	70	20	35	35	20		
AH3376	Open Drain			65	100	135	50	85	120	15		
AH3377				95	115	140	70	90	120	25		
AH3362Q*	Open Drain			15	30	45	5	20	35	10		
AH3363Q*				40	55	72	20	35	50	20		
AH3364Q*				60	80	100	40	60	80	20		
AH3365Q*				80	100	120	60	80	100	20		
AH3366Q*				65	100	135	50	85	120	15		
AH3367Q*				95	115	140	70	90	120	25		
AH3368Q*				130	155	180	105	130	160	25		
AH3369Q*				150	175	200	125	150	180	25		
AH3390Q*				180	220	240	155	195	220	25		
AH3391Q*				235	275	295	210	250	275	25		

*All Q parts are automotive-compliant, qualified to AEC-Q100 Grade 0 supporting PPAP documents, with ambient temperature of -40°C to +150°C and ESD HBM of 8kV.

OMNIPOLAR HALL SENSOR SWITCHES



THE DIODES ADVANTAGE

High/Medium Sensitivity Omnipolar Family and Internal Pullup

- Operates with either a north or south pole
- No external pullup required—minimal external components

Designed for Portable and Battery-Powered Equipment

- 1.6V to 5.5V V_{IN} —operates over typical battery voltage range
- 1.6 μ A ultra-low power operation extends battery life
- Industry-standard SC59 and SIP-3

High Performance and Reliability

- Super tight magnetic operating window (less magnetic threshold spread) with minimal switch-point drift and superior temperature stability

Part Number	Output Type	Operating Voltage Range (V)	I_{DD} Typical	Min Bop (gauss)	Typ Bop (gauss)	Max Bop (gauss)	Min Brp (gauss)	Typ Brp (gauss)	Max Brp (gauss)	Typ Hysteresis Bhys (gauss)	Features	Packages
AH1903	Push Pull	1.6 to 3.6	4.3 μ A	\pm 21	\pm 33	\pm 48	\pm 9	\pm 23	\pm 38	\pm 10	Selective Uni or Omnipolar	X1-DFN1216-4
AH1902				\pm 23	\pm 33	\pm 47	\pm 12	\pm 23	\pm 35	\pm 10	Ultra-Low Voltage	X1-DFN1216-4 X2-DFN2015-6, SOT553
AH1897				\pm 14	\pm 30	\pm 40	\pm 10	\pm 20	\pm 35	\pm 10		X1-DFN1216-4
AH1913	Push Pull	1.6 to 5.5	12 μ A	\pm 6	\pm 18	\pm 30	\pm 2	\pm 11	\pm 24	\pm 7	Ultra-Low Supply Current	X1-DFN1216-4, SC59
AH1912				\pm 19	\pm 30	\pm 42	\pm 12	\pm 23	\pm 33	\pm 7		X1-DFN1216-4, SC59
AH1911				\pm 30	\pm 60	\pm 90	\pm 22	\pm 45	\pm 67	\pm 15		SC59
AH1921				\pm 30	\pm 60	\pm 90	\pm 22	\pm 45	\pm 67	\pm 15		
AH1925	Open Drain	1.6 to 3.6	1.4 μ A	\pm 14	\pm 25	\pm 35	\pm 9	\pm 20	\pm 30	\pm 5		X2-DFN1410-4
AH1806				\pm 15	\pm 30	\pm 45	\pm 10	\pm 20	\pm 40	\pm 10	Low Voltage	SC59, SOT553, SIP-3
AH1808				\pm 20	\pm 40	\pm 60	\pm 10	\pm 30	\pm 50	\pm 10		
AH1807				\pm 50	\pm 80	\pm 115	\pm 40	\pm 65	\pm 100	\pm 15		
AH1809				\pm 90	\pm 130	\pm 185	\pm 80	\pm 115	\pm 170	\pm 15		
AH3572	Pullup Resistor	3 to 28	3mA	\pm 8	\pm 20	\pm 30	\pm 2	\pm 10	\pm 25	10	Reverse Blocking, Overcurrent Protection, Overvoltage Clamp	SOT23, SIP-3
AH3574				\pm 20	\pm 40	\pm 60	\pm 10	\pm 25	\pm 45	15		
AH3582				\pm 20	\pm 40	\pm 60	\pm 10	\pm 25	\pm 45	15		
AH3562Q*	Open Drain	3 to 28	3mA	\pm 8	\pm 20	\pm 30	\pm 2	\pm 10	\pm 25	10		
AH3563Q*				\pm 15	\pm 30	\pm 45	\pm 5	\pm 20	\pm 35	10		
AH3564Q*				\pm 20	\pm 40	\pm 60	\pm 10	\pm 25	\pm 45	15		

*All Q parts are automotive-compliant, qualified to AEC-Q100 Grade 0 supporting PPAP documents, with ambient temperature of -40°C to +150°C and ESD HBM of 8kV.

LINEAR HALL SENSORS



THE DIODES ADVANTAGE

Low-Voltage, Low-Power Linear Halls—with Micropower Mode

- Supply voltage of 1.6V to 3.6V is ideal for interfacing with ADC
- 8.9 μ A (sleep mode) AH8500/1, 13 μ A (micropower mode) AH8502/3 1.16mA at 7.14kHz sampling rate

High Sensitivity with High Accuracy (Trimmed) Options

- AH8501/3: sensitivity of 2.25mV/G @ 1.8V and 3.8mV/G @ 3V \pm 3% accuracy
- AH8500/2: Sensitivity of 2.1mV/G @ 1.8V \pm 15% accuracy

High Performance, Reliability, and Robustness

- Low 0.36G input noise and null voltage offset <1% of V_{DD}
- Low temperature coefficient for sensitivity \pm 3% over full temp

Part Number	Type	Output Type	Supply Voltage (V)	Supply Current	Sensitivity (mV/gauss)	Output Voltage Span (V)	Typical Magnetic Flux Density Range (gauss)	Sampling /Speed Control Pin	Operating Temperature (°C)	Packages
AH8500	Linear	Analog Voltage	1.6 to 3.6	12 μ A	2.10 @ 1.8V, 3.55 @ 3.0V	1.6 to 3.6	\pm 430	Y	-40 to +85	U-DFN2020-6
AH8501					2.25 @ 1.8V, 3.80 @ 3.0V		\pm 400			
AH8502					2.10 @ 1.8V, 3.55 @ 3.0V		\pm 430			
AH8503					2.25 @ 1.8V, 3.80 @ 3.0V		\pm 400			
AH49F			3 to 8	3mA	2.1 @ 5.0V	0.8 to (VCC - 0.8)	\pm 800	N	-40 to +105	U-DFN2020-6, SC59, TO-92S

HALL LATCHES



THE DIODES ADVANTAGE

High-Performance Stable Hall Effect Latch Range

- Eight sensitivity options with good tolerance and low magnetic spread with low temperature coefficients for switch points
- Magnetic characteristics specified over the whole operating range
- Fast "power on" (10 μ s) and response time (3.75 μ s) with wide bandwidth

Product Flexibility

- Designed for a wide range of applications: 3V to 28V and -40°C to +150°C
- Open-drain output for pullup flexibility
- SOT23, SC59 (inverse operating magnetic polarity to SOT23) and SIP-3 packages

Reliability and Robustness

- Input and output clamps with output current limit
- Reverse voltage protection (32V on automotive-compliant Q-parts)

Part Number	Output Type	Operating Voltage Range (V)	I _{DD} Typical (mA)	Min Bop (gauss)	Typ Bop (gauss)	Max Bop (gauss)	Min Brp (gauss)	Typ Brp (gauss)	Max Brp (gauss)	Typ Hysteresis B _{hys} (gauss)	Features	Packages
AH3772	Open Drain	3 to 28	3	10	25	40	-40	-25	-10	50	Reverse Blocking, Overcurrent Protection, Overvoltage Clamp	SIP-3
AH3781	Pullup Resistor		3.8	10	25	40	-40	-25	-10	50		
AH3774	Open Drain		3	20	40	60	-60	-40	-20	80		SC59, SOT23, SIP-3
AH3782	Pullup Resistor		3.8	20	40	60	-60	-40	-20	80		
AH3775	Open Drain		50	70	90	-90	-70	-50	140	SOT23, SIP-3		
AH3776			80	110	140	-140	-110	-80	220			
AH3777			110	140	170	-170	-140	-110	280	SIP-3		
AH3762Q*			10	25	40	-40	-25	-10	50			
AH3763Q*			15	30	45	-45	-30	-15	60	SC59, SOT23, SIP-3		
AH3764Q*			20	40	60	-60	-40	-20	80			
AH3765Q*			50	70	90	-90	-70	-50	140	SOT23, SIP-3		
AH3766Q*			80	110	140	-140	-110	-80	220			
AH3767Q*			110	140	170	-170	-140	-110	280			
AH3768Q*			140	175	200	-200	-175	-200	350			
AH3769Q*	170		220	250	-250	-220	-170	440				

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