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

diodes.com
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 (52V on automotive-compliant Q-parts)

### Part Number | Output Type | Operating Voltage Range (V) | Icc Typical | Min Bop (gauss) | Typ Bop (gauss) | Max Bop (gauss) | Min Brp (gauss) | Typ Brp (gauss) | Max Brp (gauss) | Typical Hysteresis Bbys (gauss) | Features | Packages
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
AH3389 | Push Pull | 1.6 to 3.6 | 4.3µA | 13 | 25 | 39 | 9 | 20 | 37 | 5 | Dual Output | X2-DFN1410-4-4
AH3903 | | | | 21 | 33 | 48 | 9 | 23 | 38 | 10 | Selective Uni or Omnipolar | SOT553, X1-DFN1216-4
AH3590 | Open Drain | | | 6 | 17 | 25 | 2 | 11 | 20 | 6 | | Dual Output | X2-DFN1410-4-4
AH3572 | Pullup Resistor | | | 40 | 55 | 70 | 20 | 35 | 35 | 20 | | | |
AH3573 | Open Drain | | | 65 | 100 | 135 | 50 | 85 | 120 | 15 | | SCS9, SOT23, SIP-3
AH3582 | | 3 to 28 | 3mA | 15 | 30 | 45 | 5 | 20 | 35 | 10 | | |
AH3576 | Open Drain | | | 80 | 100 | 120 | 60 | 80 | 100 | 20 | | | |
AH3577 | | | | 150 | 175 | 200 | 125 | 150 | 180 | 25 | | SOT23, SIP-3
AH3562Q* | Open Drain | | | 65 | 100 | 135 | 50 | 85 | 120 | 15 | | |
AH3565Q* | | 3 to 28 | 3mA | 15 | 30 | 45 | 5 | 20 | 35 | 10 | | |
AH3564Q* | | | | 80 | 100 | 120 | 60 | 80 | 100 | 20 | | | |
AH3565Q* | | | | 150 | 175 | 200 | 125 | 150 | 180 | 25 | | SOT23, SIP-3
AH3566Q* | | | | 150 | 175 | 200 | 125 | 150 | 180 | 25 | | SOT23, SIP-3
AH3564Q* | | | | 235 | 275 | 295 | 210 | 250 | 275 | 25 | | SOT23, SIP-3
AH3566Q* | | | | 180 | 220 | 240 | 155 | 195 | 220 | 25 | | SOT23, SIP-3
AH3564Q* | | | | 235 | 275 | 295 | 210 | 250 | 275 | 25 | | SOT23, SIP-3

*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 VIN operates over typical battery voltage range
- 1.6µA 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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output Type</th>
<th>Operating Voltage Range (V)</th>
<th>Output Type</th>
<th>Supply Voltage (V)</th>
<th>Sensitivity (mV/gauss)</th>
<th>Output Voltage Span (V)</th>
<th>Typical Magnetic Flux Density Range (gauss)</th>
<th>Sampling Speed/Control Pin</th>
<th>Operating Temperature (°C)</th>
<th>Packages</th>
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<tbody>
<tr>
<td>AH1903</td>
<td>Push/Pull</td>
<td>16 to 3.6</td>
<td>Linear</td>
<td>Analog Voltage</td>
<td>12µA</td>
<td>2.10 @ 1.8V, 3.55 @ 3.0V</td>
<td>1.6 to 3.6</td>
<td>±450</td>
<td>Y</td>
<td>-40 to +85</td>
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<td>AH1902</td>
<td>Push/Pull</td>
<td>16 to 3.6</td>
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<td>Analog Voltage</td>
<td>13µA</td>
<td>2.25 @ 1.8V, 3.8 @ 3.0V</td>
<td>1.6 to 3.6</td>
<td>±400</td>
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<td>-40 to +85</td>
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<td>±400</td>
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<td>-40 to +85</td>
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</table>

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### LINEAR HALL SENSORS

**Low-Voltage, Low-Power Linear Halls—with Micropower Mode**
- Supply voltage of 1.6V to 3.6V is ideal for interfacing with ADC
- 8.9µA (sleep mode) AH8500/1, 13µA (micropower mode) AH8502/3 116mA at 7.1kHz sampling rate

**High Sensitivity with High Accuracy (Trimmered) Options**
- AH8501/3: sensitivity of 2.25mV/G @ 1.8V and 3.8 mV/G @ 3V ±3% accuracy
- AH8502/3: sensitivity of 2.1 mV/G @ 1.8V ±1% accuracy

**High Performance, Reliability, and Robustness**
- Low 0.36G input noise and null voltage offset <1% of VDD
- Low temperature coefficient for sensitivity ±3% over full temp

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<th>Part Number</th>
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<th>Output Type</th>
<th>Supply Voltage (V)</th>
<th>Supply Current</th>
<th>Sensitivity (mV/gauss)</th>
<th>Output Voltage Span (V)</th>
<th>Typical Magnetic Flux Density Range (gauss)</th>
<th>Sampling Speed/Control Pin</th>
<th>Operating Temperature (°C)</th>
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<td>1.6 to 3.6</td>
<td>±450</td>
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<td>-40 to +85</td>
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<td>13µA</td>
<td>2.25 @ 1.8V, 3.8 @ 3.0V</td>
<td>1.6 to 3.6</td>
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<td>±400</td>
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<td>3mA</td>
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<td>0.8 to (VCC - 0.8)</td>
<td>±800</td>
<td>N</td>
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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” (10µs) and response time (3.75µs) 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 (52V on automotive compliant Q-parts)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output Type</th>
<th>Operating Voltage Range (V)</th>
<th>I DD Typical (mA)</th>
<th>Min Bop (gauss)</th>
<th>Typ Bop (gauss)</th>
<th>Max Bop (gauss)</th>
<th>Min Brp (gauss)</th>
<th>Typ Brp (gauss)</th>
<th>Max Brp (gauss)</th>
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<td>Reverse Blocking, Overcurrent Protection, Overvoltage Clamp</td>
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