

Introduction

AH401, designed with Bipolar technology, includes on-chip Hall element voltage generator, a voltage regulator for operation with supply voltages of 4.5 to 60V, reverse voltage protection, temperature compensation circuitry, small-signal amplifier, Schmitt trigger and an open-collector output.

The sensor is designed to respond to North and South poles. While the magnetic flux density(B) is larger than operate point Bop, the output will be turned on with low output level. Then the output is held until the magnetic flux (B) is lower than release point Brp. The output will be turned off with high output level.

AH401 offers a variety of packages, including TO-92, SOT-23. All packages are RoHS compliant.

Features

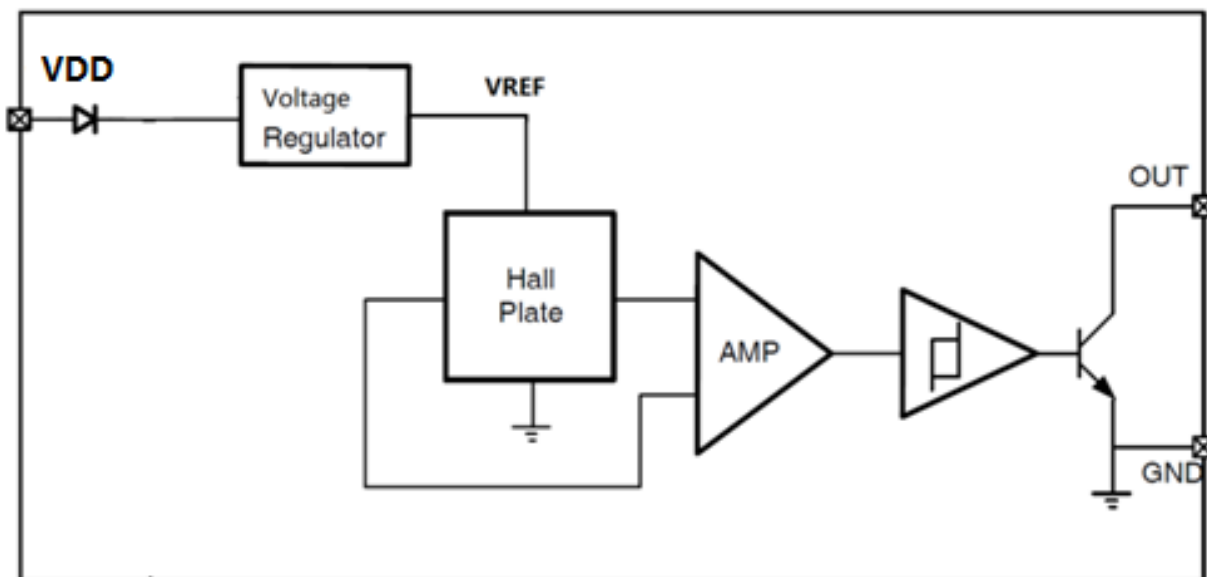
- Miniature construction
- High sensitivity of +/-55 Gauss (typ.)
- Wide voltage range of 4.5 Vdc to 60 Vdc
- Temperature range of -40 °C to 150 °C
- Open Collector Output

Applications

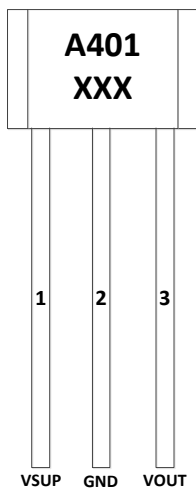
- BLDC Motor Commutation
- Flow sensor
- Position sensor
- Speed sensor
- Proximity sensor

Function diagram

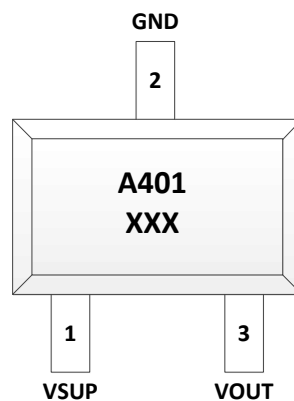
AH401, designed with Bipolar technology, includes on-chip Hall element voltage generator, a voltage regulator for operation with supply voltages of 4.5 to 60V, reverse voltage protection, temperature compensation circuitry, small-signal amplifier, Schmitt trigger and an open-collector output.



Pin orientation



TO92S



Sot23-3L

Ordering information

| Part number | Package | Packing | Ambient, T _A |
|-------------|---------|-----------------------------|-------------------------|
| AH401UA | TO92S | Bulk, 1000 pieces/bag | -40°C to 150°C |
| AH401SU | SOT23 | Tape&Reel, 3000 pieces/reel | -40°C to 150°C |

Pin assignment

| SOT23-3LPin number | TO92SPin number | Name | Function |
|--------------------|-----------------|------|-----------------|
| 1 | 1 | VSUP | 供电电压 4.5V 至 60V |
| 2 | 2 | GND | 地线 |
| 3 | 3 | VOUT | 集电极开路输出，需接上拉电阻 |

Absolute Maximum Ratings

The absolute maximum value is the limiting value when the chip is applied, above which the chip can be damaged. Although the function of the chip is not necessarily damaged when the absolute maximum value is exceeded, the reliability of the chip may be affected if the absolute maximum value is exceeded for a certain time.

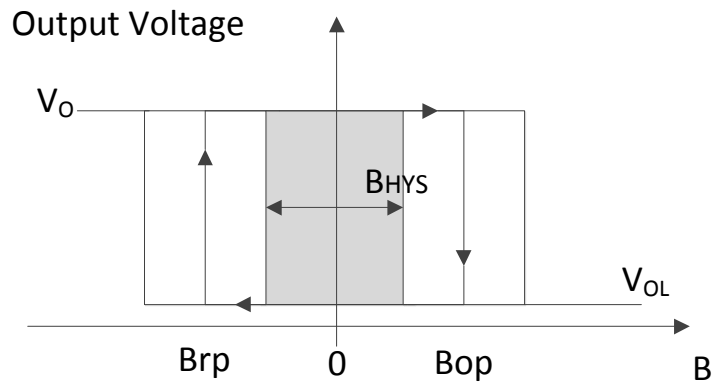
| Parameter | Symbol | Min | Max | Units |
|-----------------------------|-------------------|------|-----|-------|
| Supply voltage | VDD | -60 | 95 | V |
| Reverse voltage | Vout | -0.5 | 70 | V |
| Output Sink Current | I _{sink} | 0 | 40 | mA |
| Operating temperature range | T _a | -40 | 150 | °C |
| Storage temperature range | T _s | -50 | 165 | °C |

High Voltage Hall Effect Switch Sensor **Vinbelltech Co. Ltd**

Electrical and magnetic characteristics (Ta=25°C, VDD =5.0V)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|-----------------------------------|---------------------------|--|------|-----|-----|-------|
| Electrical characteristics | | | | | | |
| VDD | Operating voltage | | 4.5 | | 60 | V |
| IDD | Supply current | | | 3.5 | 7 | mA |
| I _{le} | Leakage current | Off condition | | | 10 | uA |
| V _{sat} | Saturation voltage output | I _{out} =20mA, On condition | | | 0.4 | V |
| T _r | Output rising time | Pullup resistor =1kohms, Load cap=20pF | | | 1 | uS |
| T _f | Output falling time | Pullup resistor =1kohms, Load cap=20pF | | | 1.5 | uS |
| Magnetic characteristics | | | | | | |
| B _{op} | Operate point | Pullup resistor =1kohms, Load cap=20pF | 10 | 55 | 110 | Gauss |
| B _{rp} | Release point | Pullup resistor =1kohms, Load cap=20pF | -110 | -55 | -10 | Gauss |
| B _{hys} | Hysteresys | Pullup resistor =1kohms, Load cap=20pF | | 110 | | Gauss |

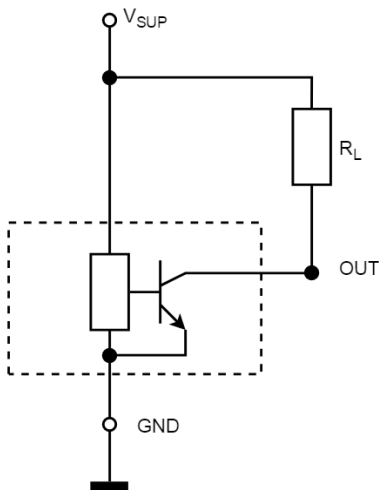
Output Behavior



AH401UA/SU output behavior

Application Circuits

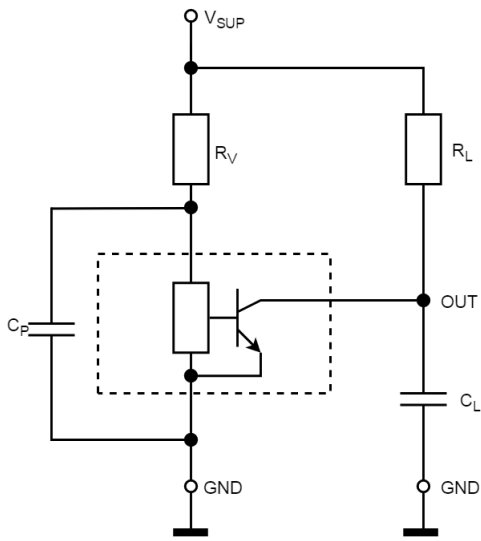
Typical application circuit (see the following circuit) $R_L = 4700$ ohms



Case 1 of typical application circuit

Automotive and Harsh, Noisy Environments Three-Wire Circuit is show below. Here,

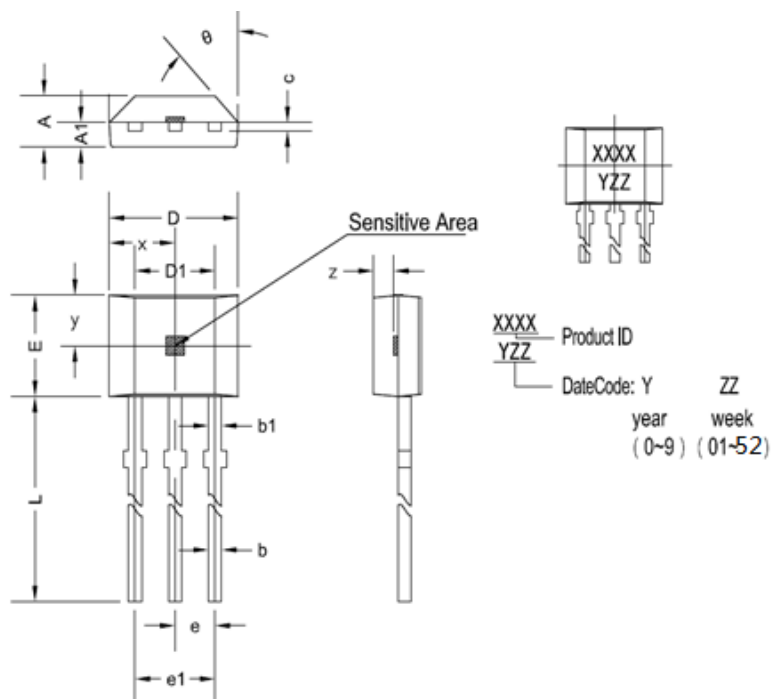
$R_V = 100$ ohms, $C_P = 4.7$ nF, and $C_L = 1$ nF.



Case 2 of typical application circuit

Package dimensions

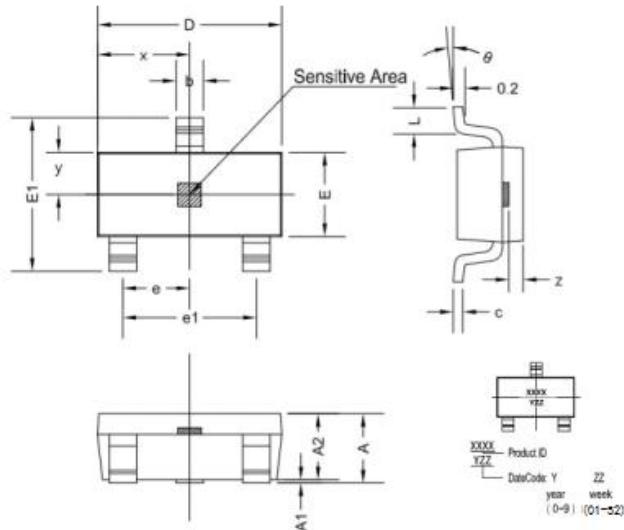
T092S



T092S dimensions

| symbol | Size (mm) | | Size (in inches) | |
|----------|-----------|---------|------------------|---------|
| | minimum | maximum | minimum | maximum |
| A | 1.42 | 1.67 | 0.056 | 0.066 |
| A1 | 0.66 | 0.86 | 0.026 | 0.034 |
| b | 0.35 | 0.56 | 0.014 | 0.022 |
| b1 | 0.4 | 0.55 | 0.016 | 0.022 |
| C | 0.36 | 0.51 | 0.014 | 0.02 |
| D | 3.9 | 4.2 | 0.154 | 0.165 |
| D1 | 2.97 | 3.27 | 0.117 | 0.129 |
| E | 2.9 | 3.28 | 0.114 | 0.129 |
| e | 1.270 TYP | | 0.050 TYP | |
| e1 | 2.44 | 2.64 | 0.096 | 0.104 |
| L | 13.5 | 15.5 | 0.531 | 0.61 |
| x | 2.025TYP | | 0.080TYP | |
| y | 1.545TYP | | 0.061TYP | |
| z | 0.500TYP | | 0.020TYP | |
| θ | 45° TYP | | 45° TYP | |

SOT23



SOT23 dimensions

| symbol | Size (mm) | | Size (in inches) | |
|--------|-----------|---------|------------------|---------|
| | minimum | maximum | minimum | maximum |
| A | 1.05 | 1.25 | 0.041 | 0.049 |
| A1 | 0 | 0.1 | 0 | 0.004 |
| A2 | 1.05 | 1.15 | 0.041 | 0.045 |
| b | 0.3 | 0.5 | 0.012 | 0.02 |
| c | 0.100 | 0.2 | 0.004 | 0.008 |
| D | 2.82 | 3.02 | 0.111 | 0.119 |
| E | 1.5 | 1.7 | 0.059 | 0.067 |
| E1 | 2.65 | 2.95 | 0.104 | 0.116 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.8 | 2 | 0.071 | 0.079 |
| L | 0.3 | 0.6 | 0.012 | 0.024 |
| x | 1.460TYP | | 0.057TYP | |
| y | 0.800TYP | | 0.032TYP | |
| z | 0.600TYP | | 0.024TYP | |
| θ | 0° | 8° | 0° | 8° |

Copyright ©2018, Vinbelltech Co. Ltd

Vinbelltech Co. Ltd reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the performance, reliability, or manufacturability of its products. Before placing an order, the user is cautioned to verify that the information being relied upon is current.

Vinbelltech's products are not to be used in any devices or systems, including but not limited to life support devices or systems, in which a failure of Vinbelltech's product can reasonably be expected to cause bodily harm.

The information included herein is believed to be accurate and reliable. However, Vinbelltech Co. Ltd assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.