

# Low Power Unipolar Hall Sensor

## Introduction

AH465 is designed and produced using CMOS technology. It is a south pole (AH465UA) or north pole (AH465SU) sensitive low-power unipolar Hall effect switch. The device integrates a voltage regulator, a Hall voltage generator, a small signal amplifier, a chopper regulator, and schmitt-trigger and push-pull output. The sensor has the characteristics of good temperature stability, strong stress resistance and high sensitivity, and its operating voltage is 2.5-5.5V.

AH465 provides TO-92S in-line package and SOT23-3L package. Both packages meet RoHS environmental protection standards.

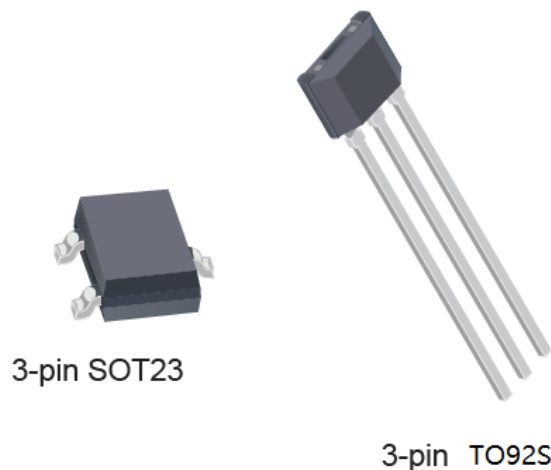
## Features

- Micro-power battery-powered applications
- Omnipolar output switch
- Push-pull output
- ESD HBM  $\pm 4$  kV
- Operating voltage 2.5-5.5V

## Application

- Solid state switch
- Cordless mobile phone reminder switch
- Flip phone screen saver switch
- Proximity switch
- Magnetic sensor switch with low duty cycle
- instead of reed
- Level gauge

## Package



## Low Power Unipolar Hall Sensor

### Ordering Information

Part Number	Package	Packing	Operating Temperature
AH465UA	TO92S	Bulk, 1000 pieces/bag	-40°C to 85°C
AH465SU	SOT23-3L	Reel, 3000 pieces/reel	-40°C to 85°C

### Limit Parameters

The limit parameter is the limit value when the chip is applied. Exceeding the limit value may damage the chip. Although the function of the chip is not necessarily damaged when the limit parameter is exceeded, if the limit value is exceeded within a certain period of time, the reliability of the chip may be affected.

Parameter	Symbol	Value	Unit
Supply voltage	VDD	6.0	V
Reverse voltage	VDD	-0.3	V
Output Current	IOUT	±5	mA
Output Voltage	VOUT	6.0	V
Operating temperature range	Ta	-40~85	°C
Storage temperature range	Ts	-50~150	°C

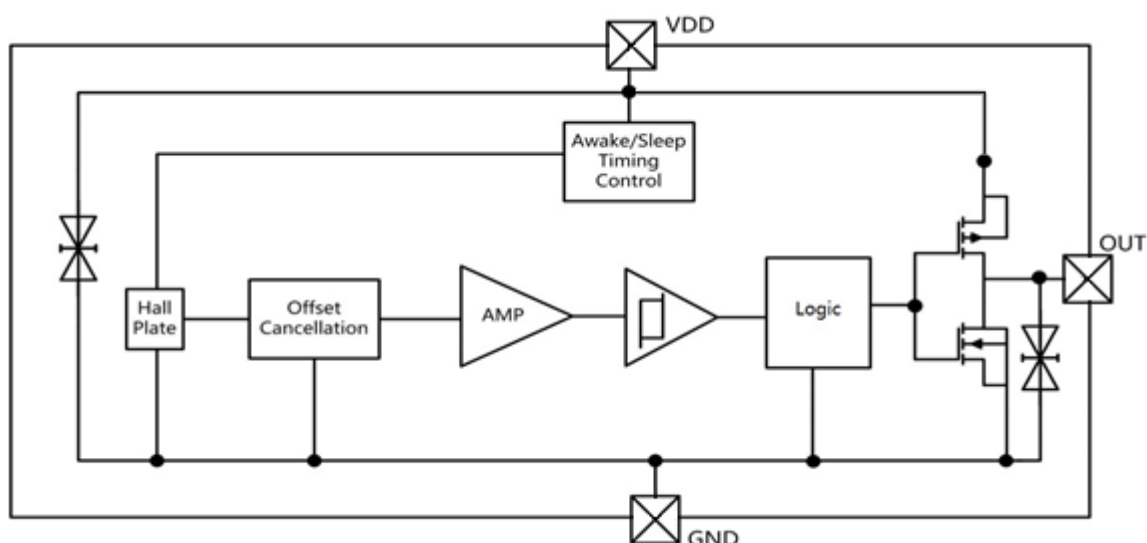
### Electrical and magnetic characteristics (Ta =25°C, VDD = 3.0V)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Electrical characteristics						
Operating voltage	VDD		2.5		5.5	V
Output low voltage	VOL	IOUT=1mA			0.2	V
Output high voltage	VOH	IOUT=-1mA	VDD-0.2			V
Output current	IOUT	Output low voltage			3.0	mA
		Output high voltage	-2.0			mA
Awake current	Iaw			2.8		mA
Average current	IDD			5	10	uA
Wake-up mode time	Taw			50	80	us
Sleep mode time	Tp			100	150	ms
Working frequency	Fw		6	10		Hz
Response frequency	Fr		3	5		Hz

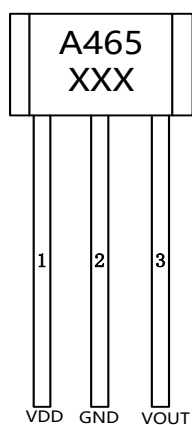
## Low Power Unipolar Hall Sensor

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Magnetic characteristics						
Operate point	Bop			30		Gauss
Release point	Brp			20		Gauss
Hysteresis	Bhys	Bop-Brp		10		Gauss

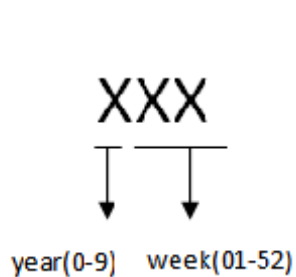
### Function diagram



### Pin Description



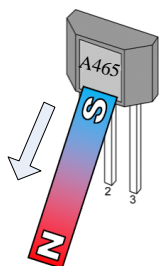
**TO92S**



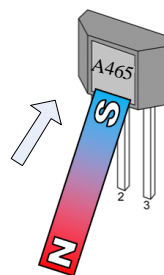
**SOT23**

## Low Power Unipolar Hall Sensor

### Application example



VOUT=High

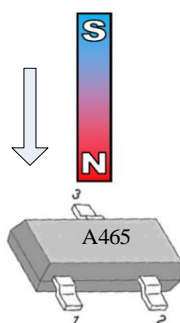


VOUT=Low

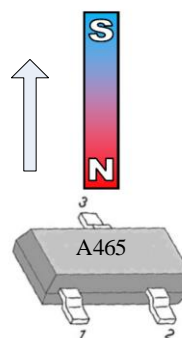
### TO92S (AH465UA)

### TO92S Pin Description

Name	Pin Number	Description
VDD	1	Power supply
GND	2	Ground
VOUT	3	Output



VOUT=Low



VOUT=High

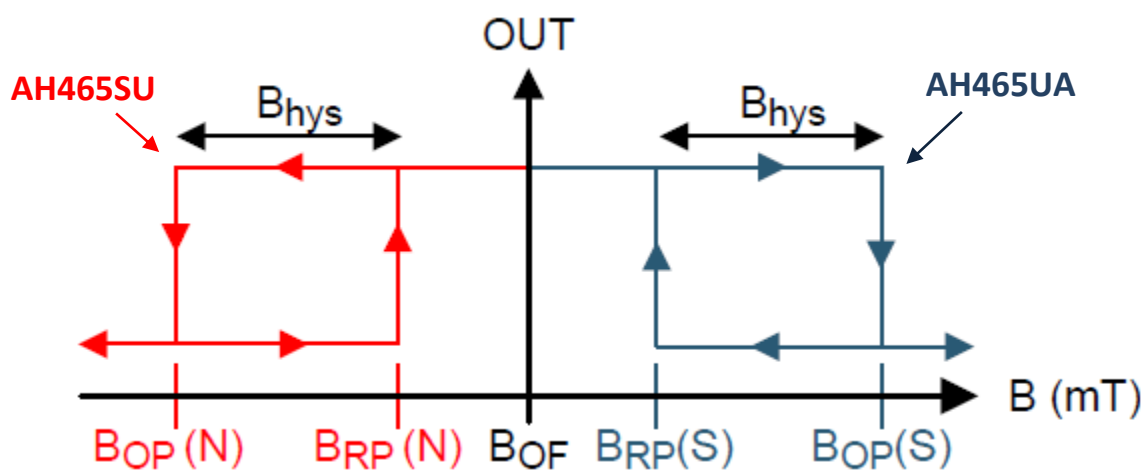
### SOT23 (AH465SU)

### SOT23 Pin Description

Name	Pin Number	Description
VDD	1	Power supply
VOUT	2	Output
GND	3	Ground

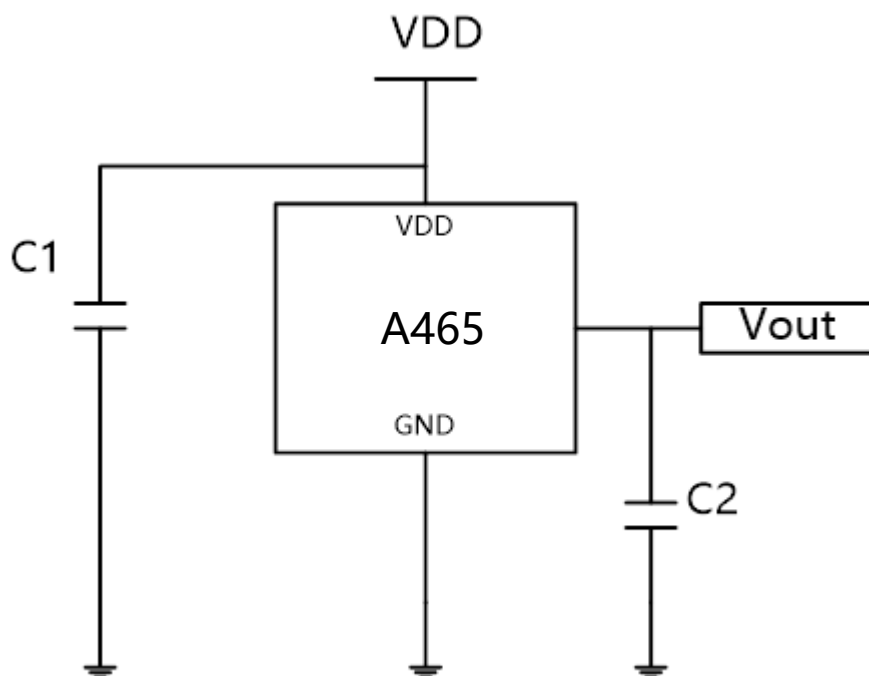
# Low Power Unipolar Hall Sensor

## Output Behavior



## Application Circuit

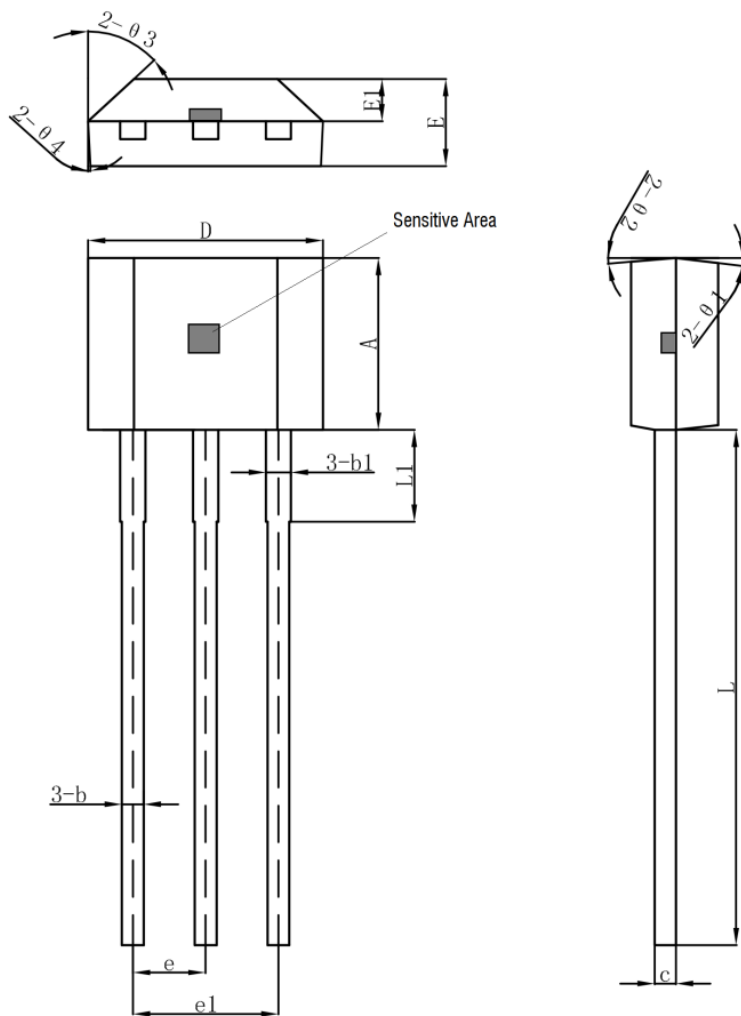
$C1=10nF$ ,  $C2=100pF$



Typical application circuit

### Package dimensions

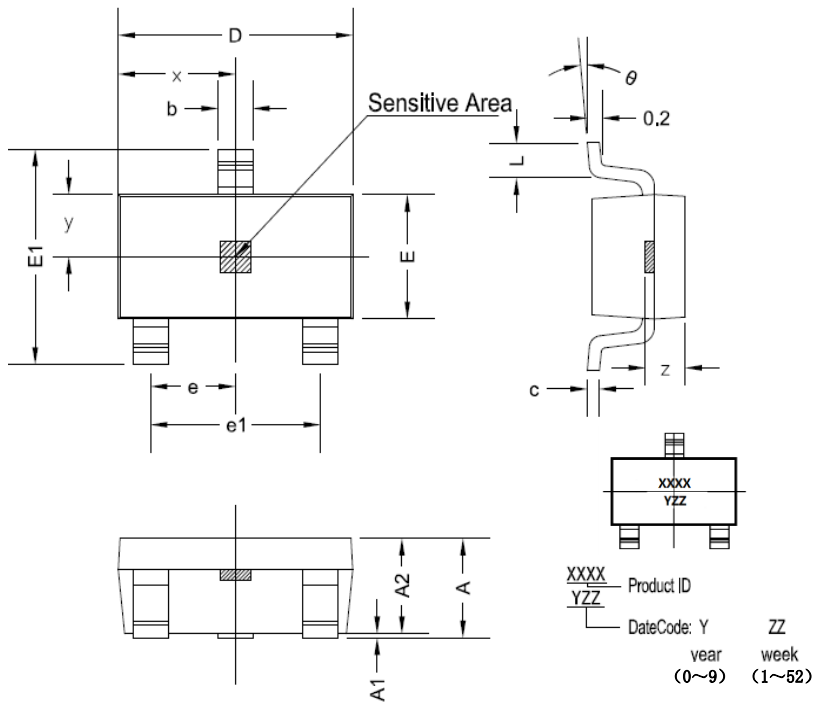
#### T092S



Symbol	Size (mm)		
	Min.	Typ.	Max.
A	2.90	3.00	3.10
b	0.35	0.39	0.40
b1		0.44	
c	0.36	0.38	0.40
D	4.00	4.10	4.20
E	1.42	1.52	1.62
E1		0.75	
e		1.27	
e1		1.27	
L		2.54	
L1	13.50	14.50	15.50
$\theta 1$		6°	
$\theta 2$		3°	
$\theta 3$		45°	
$\theta 4$		3°	
h		3.6	

## Low Power Unipolar Hall Sensor

### SOT23



Symbol	Size(mm)		Size (inch)	
	Min.	Max.	Min.	Max.
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, Alfa Electronics Co. ,Ltd

Alfa Electronics 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.

Alfa' 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 Alfa' s product can reasonably be expected to cause bodily harm.

The information included herein is believed to be accurate and reliable. However, Alfa Electronics 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.