

## CYD443H Unipolar HALL-EFFECT SWITCH IC

CYD443H Hall-effect switch integrated circuit for high temperature operating is based on Hall-effect principle and the semiconductor monolithic technology, which includes a voltage regulator, Hall voltage generator, differential amplifier, Schmitt trigger and an open-collector output on a single silicon chip. ICs can convert the input magnetic field signal into digital voltage output.

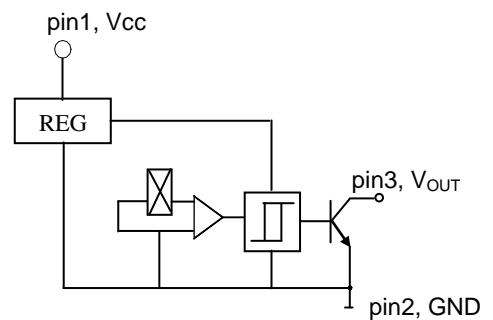
### FEATURES

- ◆ Small size
- ◆ High Sensitivity
- ◆ Quick Response
- ◆ High temperature (-40°C ~+150°C)
- ◆ Good Temperature Performance
- ◆ High Accuracy
- ◆ Excellent Reliability

### TYPICAL APPLICATION

- ◆ Non-contact Switch
- ◆ Automotive Ignition
- ◆ Brake ICs
- ◆ Position control
- ◆ Revolution detection
- ◆ Automobile Electronics
- ◆ Brushless Motor

### FUNCTIONAL BLOCK DIAGRAM

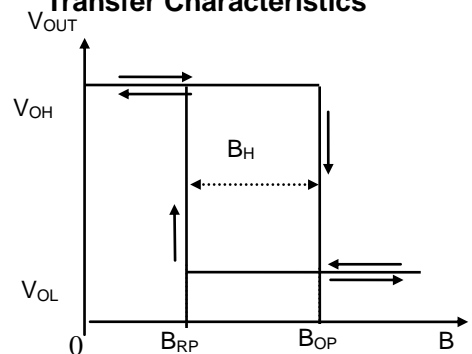


### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	30	V
Quiescent Output Voltage	V <sub>O</sub>	30	V
Output Current	I <sub>O</sub>	50	mA
Operating Temperature Range	T <sub>A</sub>	-40~150	°C
Storage Temperature Range	T <sub>S</sub>	-55~150	°C

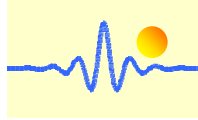
### Magnetic-Electrical

#### Transfer Characteristics



### ELECTRICAL CHARACTERISTICS

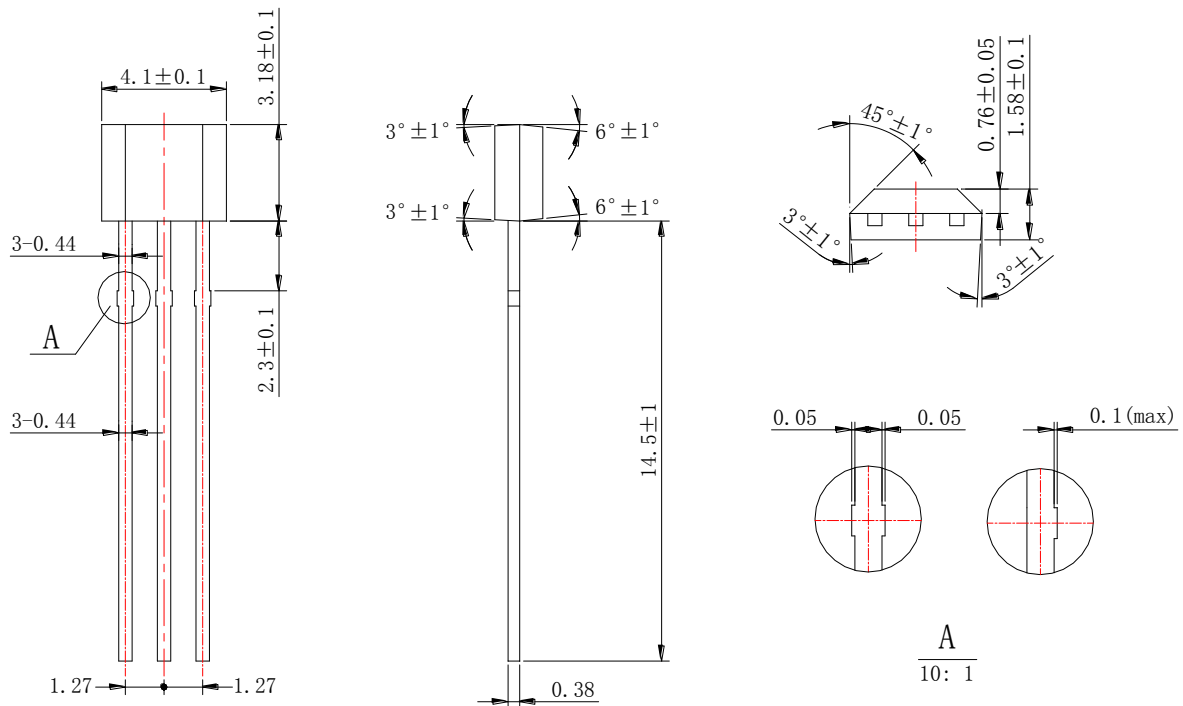
Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage	V <sub>CC</sub> =4.0V~30V	V <sub>CC</sub>	4.0	-	30	V
Output Low Voltage	V <sub>CC</sub> =4.5V, V <sub>O</sub> =24V I <sub>O</sub> =20mA, B≥B <sub>OP</sub>	V <sub>OL</sub>	-	0.2	0.4	V
Output Leakage Current	V <sub>O</sub> =24V, B<B <sub>RP</sub>	I <sub>OH</sub>	-	<1.0	10	μA
Supply Current	V <sub>CC</sub> =24V, V <sub>O</sub> open-collector output	I <sub>CC</sub>	-	5.0	-	mA
Output Rise time	V <sub>CC</sub> =12V, R <sub>L</sub> =820Ω C <sub>L</sub> =20pF	t <sub>r</sub>	-	0.2	2.0	μS
Output Fall time		t <sub>f</sub>	-	0.18	2.0	μS



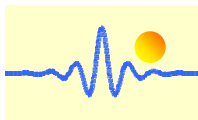
## Magnetic Characteristics

Parameter		Min (mT)	Typ (mT)	Max (mT)
Operate Point ( $B_{OP}$ )	$T_A=25^\circ\text{C}$	5.0	7.0	10.0
	Full Operating Temperature Range	3.0	7.5	10.5
Release Point ( $B_{RP}$ )	$T_A=25^\circ\text{C}$	2.0	4.5	7.0
	Full Operating Temperature Range	2.0	4.5	7.5
Hysteresis ( $B_H$ )	$T_A=25^\circ\text{C}$	-	3.0	-
	Full Operating Temperature Range	-	3.0	-

## Package Outline Drawing (Unit: mm)

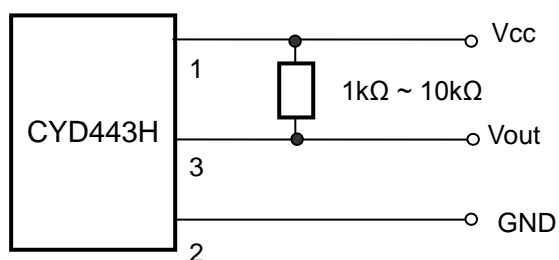


**Pin Notes:** 1. Power Supply, 2. Ground, 3. Output



## Connection

This sensor has an OC (NPN) output voltage. Therefore it is necessary to connect a pull-up resistor in value from  $1\text{k}\Omega$  to  $10\text{k}\Omega$  between the power supply  $V_{cc}$  and output pins.



## Cautions:

- 1) It is possible that outside mechanical stress affects the operating point and the release point of Hall-effect circuit, therefore, mechanical stress should be lessened as far as possible in the process of assembly;
- 2) Pay attention to the soldering temperature ( $<260^{\circ}\text{C}$ ) at the leads; keep it lower in a short time ( $<3\text{s}$ ) to guarantee good soldering quality.