

## HALL EFFECT BIPOLAR SWITCH IC CYD3172X

CYD3172X Hall effect latch IC is composed of a reverse protector, voltage regulator, Hall voltage generator, differential amplifier, Schmitt trigger and an open-collector output on a single silicon chip. ICs can convert the changeable magnetic field signal into digital voltage output.

### FEATURES

- High Sensitivity
- Resistant to Physical Stress
- Wide Supply Voltage Range
- Interfacing with All Kinds of Logic Circuits Directly

### TYPICAL APPLICATION

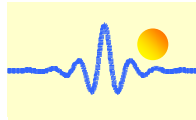
- High Sensitive Non-contact Switch
- DC Brushless Motor
- DC Brushless Fan

### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value		Unit
		Min	Max	
Supply Voltage	V <sub>CC</sub>	4.5V ~ 24V		V
Magnetic Flux Density	B	unlimited	unlimited	mT
Output Current	I <sub>O</sub>	-	25	mA
Operating Temperature Range	T <sub>A</sub>	-40	85	°C
Storage Temperature Range	T <sub>S</sub>	-65	170	°C

### ELECTRICAL CHARACTERISTICS

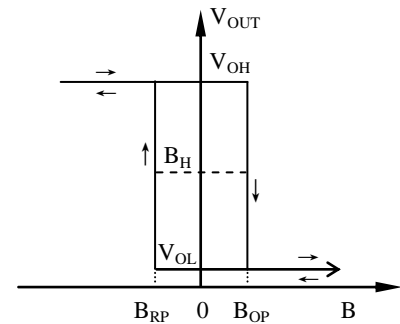
Parameter	Test Conditions	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage	V <sub>CC</sub> =4.5V~24V	V <sub>CC</sub>	4.5	-	24.0	V
Output Low Voltage	V <sub>CC</sub> =4.5V R <sub>L</sub> =960Ω	V <sub>OL</sub>	-	0.2	0.4	V
Output Leakage Current	V <sub>O</sub> =V <sub>CC</sub> max B≤B <sub>RP</sub>	I <sub>OH</sub>	-	1.0	10.0	μA
Supply Current	V <sub>CC</sub> =V <sub>CC</sub> max open-collector output	I <sub>CC</sub>	-	-	12.0	mA
Output Rise time	V <sub>CC</sub> =12V R <sub>L</sub> =820Ω	t <sub>r</sub>	-	1.0	2.0	μs
Output Fall time	C <sub>L</sub> =20pF	t <sub>f</sub>	-	1.0	2.0	μs



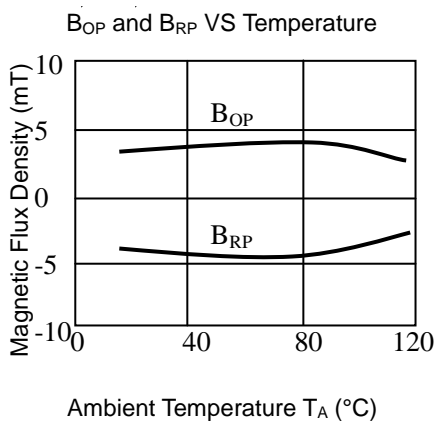
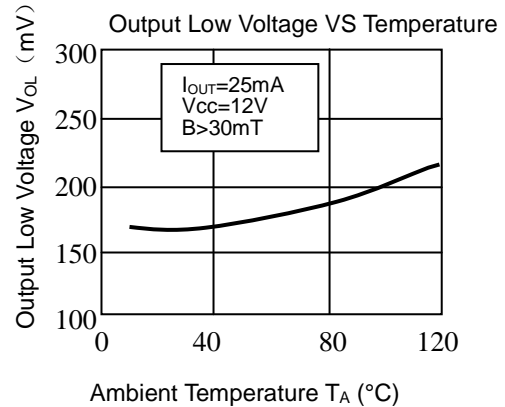
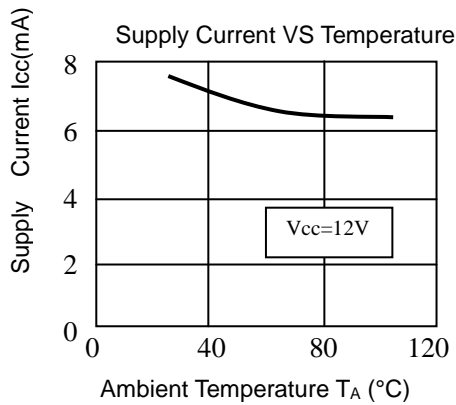
**Magnetic Characteristics (Unit: mT)**

Parameter	Value			Unit
	Min	Typ	Max	
Operate Point ( $B_{OP}$ )	1	-	7	mT
Release Point ( $B_{RP}$ )	-7	-	-1	
Hysteresis ( $B_H$ )	4	-	-	

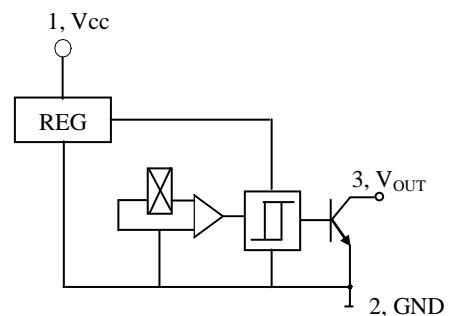
**Magnetic-Electrical Transfer Characteristics**

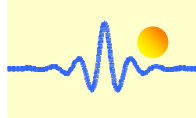


**Characteristics Curves**

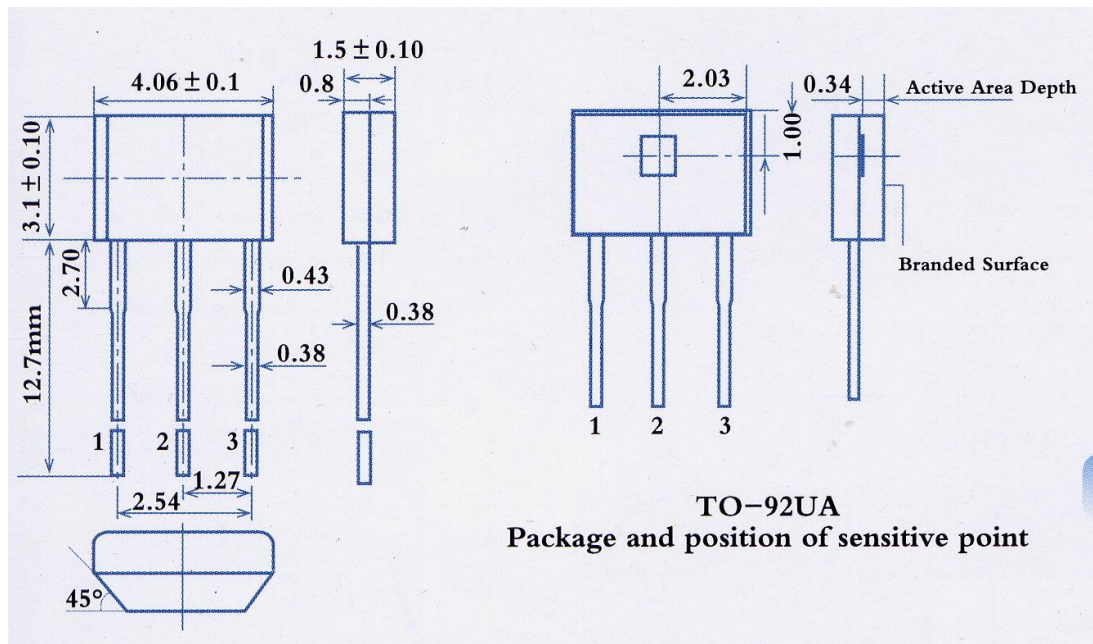


**FUNCTIONAL BLOCK DIAGRAM**





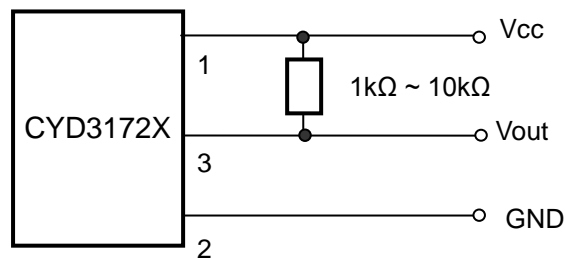
## Package Outline Drawing (Unit: mm)



**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 1kΩ to 10kΩ between the power supply Vcc 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 at the leads; keep it lower in a short time to guarantee good soldering quality.