

## Bipolar Hall Effect Switch CYD72X

CYD72X is a Hall sensor with latched digital output. It's suitable for electronic commutation of brushless DC motor applications. The CYD72X uses a chopper amplifier for magnetic signal amplification, which can achieve a low offset. Thus it provides precise magnetic switching thresholds.

If a magnetic flux density larger than threshold  $B_{op}$ , NO is turned on (low). The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  causing NO to be turned off (high)

### Features

♦ Maximum output sink current 50mA	♦ Reverse polarity protection
♦ Open collector pre-driver	♦ Package : SIP-3L

### Block Diagram

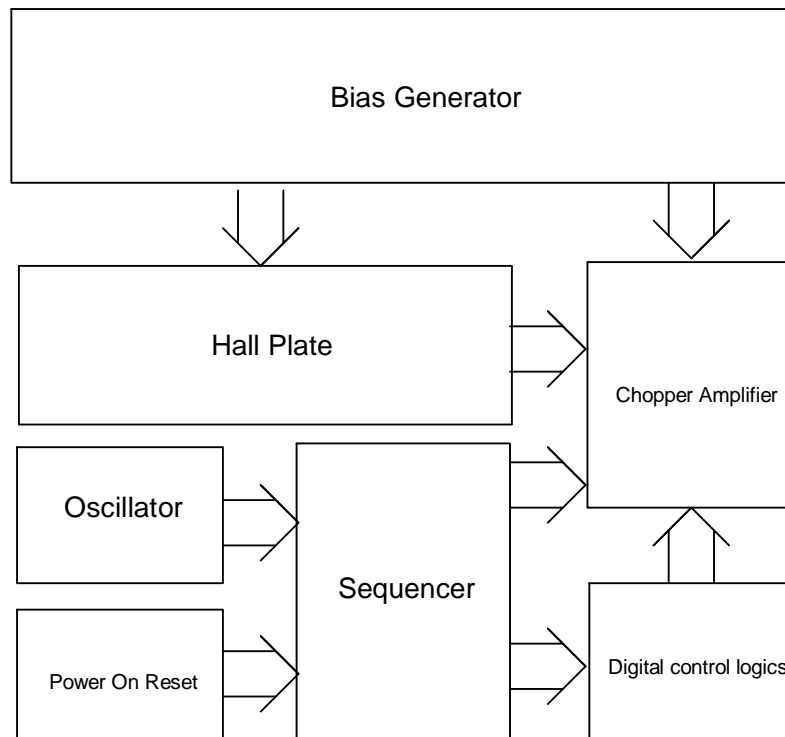
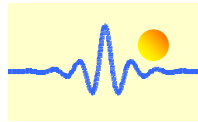


Figure 1



## Functional Descriptions

Refer to the block diagram (Figure.1), CYD72X is composed of the following building blocks:

- **Bias generator**

The bias generator provides precise, temperature- and process-insensitive bias references for the analog blocks. These references guarantee proper operation of the chip under all conditions specified in this specification.

- **Oscillator + Sequencer**

The built-in oscillator provides the clock signal, which is taken by the sequencer to generate the sequential signals necessary for both the Hall sensor and the digital control logics

- **Power on Reset**

It is used to detect the power-up ramp and reset the digital circuits to attain correct operation as soon as the power is ready.

- **Chopper Amplifier**

To achieve a higher magnetic sensitivity the chopper amplifier structure is adopted in this design. Use of this structure dynamically removes both the offset and flicker noise at the same time.

- **Digital control logics**

It generates controlling signals for the Hall sensor.

## Recommended Operating Conditions

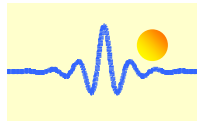
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Supply Voltage	V <sub>DD</sub>	-	2.4		16	V
Operating Temperature Range	T <sub>A</sub>	-	-20		105	°C

## Electrical Characteristics V<sub>DD</sub>=12.0V, T<sub>A</sub>=25°C (unless otherwise specified)

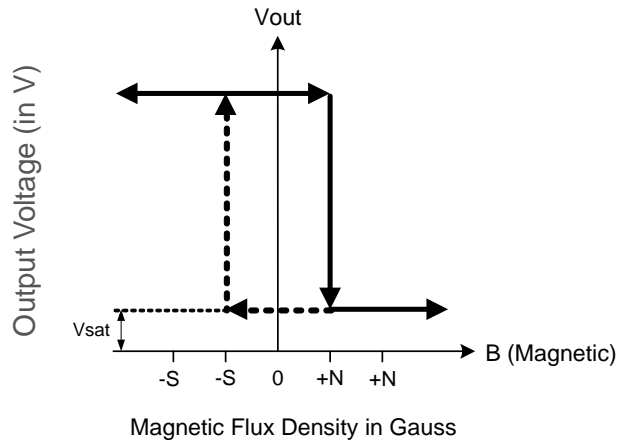
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Average Supply Current(no load)	I <sub>DD</sub>	-		3.0	10	mA
Output Saturation Voltage	V <sub>SAT</sub>	I <sub>out</sub> = 50mA		0.5	0.8	V
Output leakage current	I <sub>LEAK</sub>	V <sub>OUT</sub> =12V			20	μA
On resistance	R <sub>ON</sub>			10		Ω

## Magnetic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operate Points	B <sub>OP</sub>			+25		G
Release Points	B <sub>RP</sub>			-25		G
Hysteresis	B <sub>HYST</sub>			50		G



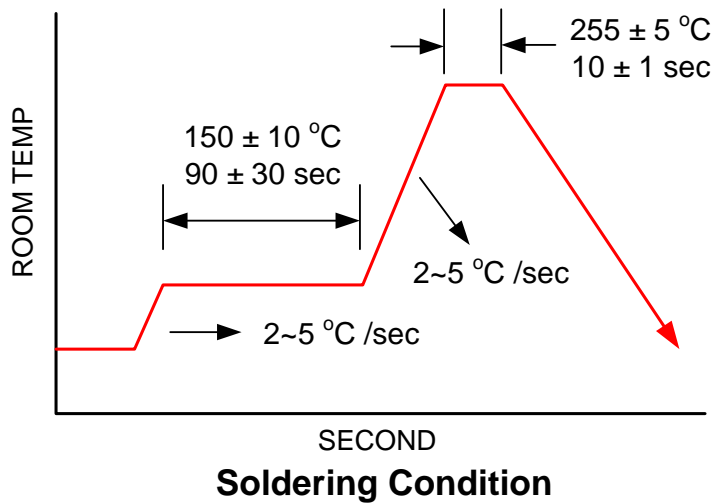
### Hysteresis Characteristics



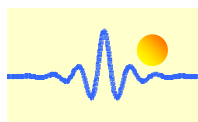
**Figure 2**

### Absolute Maximum Ratings

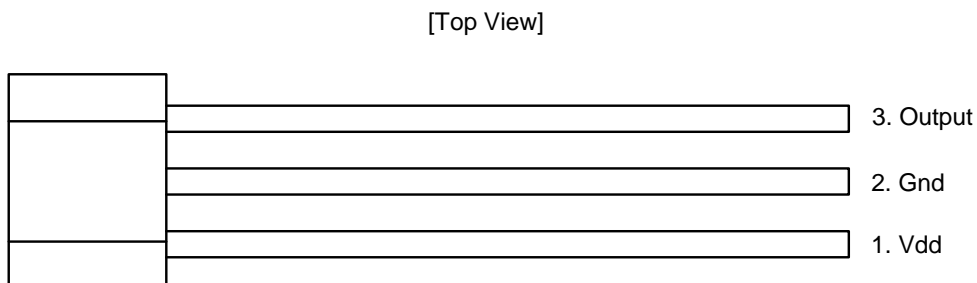
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operating Temperature	T <sub>OP</sub>	-	-20		105	°C
Storage Temperature	T <sub>ST</sub>	-	-40		150	°C
DC Supply Voltage	V <sub>DD</sub>	-	2.4		16	V
Supply Current	I <sub>DD</sub>	-			10	mA
Continuous Current	I <sub>O(CONT)</sub>				50	mA
Junction temperature	T <sub>J</sub>				150	°C
Lead Temperature		10sec			260	°C



**Figure 3**



## Pin Connection



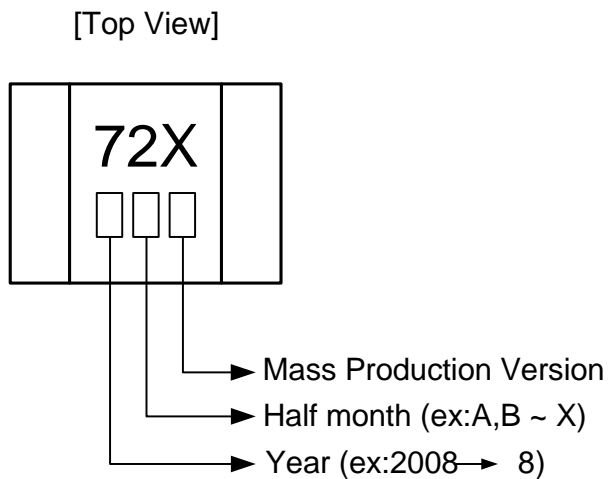
**Figure 4**

## Pin Descriptions

Name	I/O	Pin No.	Description
Vdd	P	1	Positive power supply
Gnd	G	2	Ground
Output	O	3	Driver output

Legend: I=input, O=output, I/O=input/output, P=power supply, G=ground

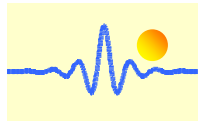
## Marking Information



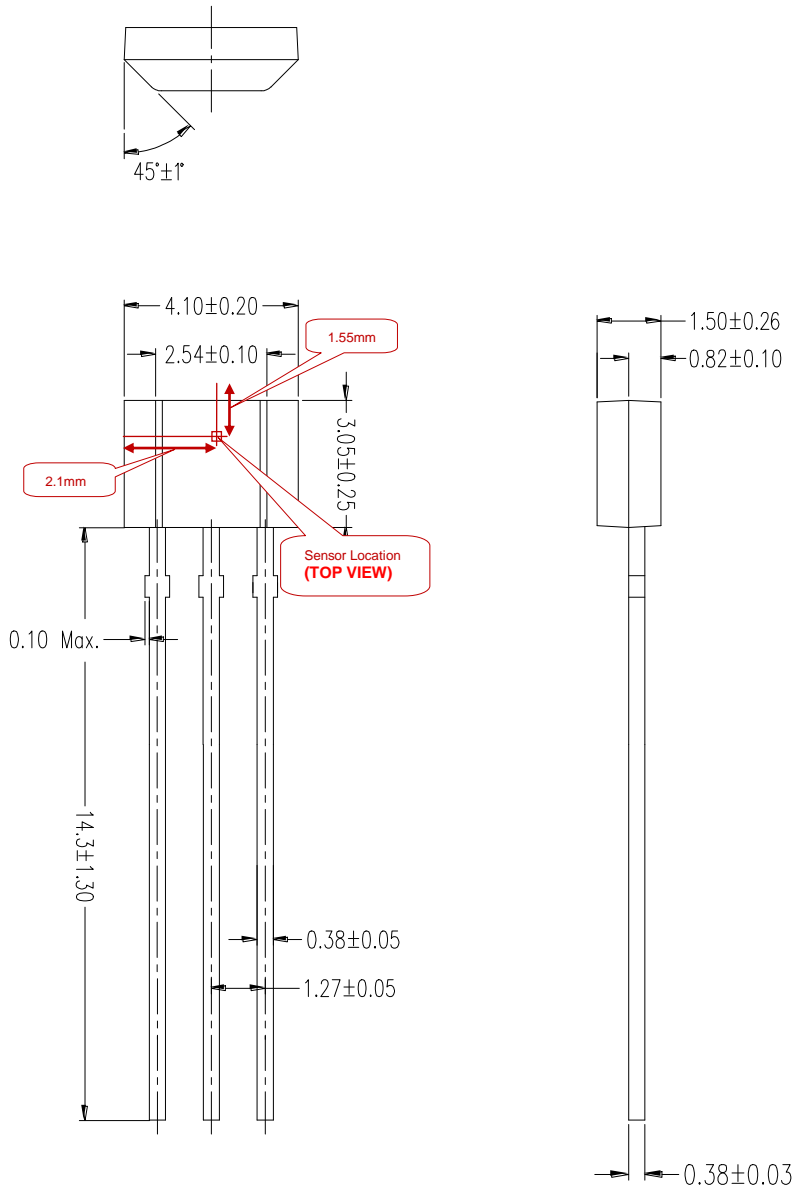
**Figure 5**

## Order Information

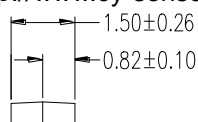
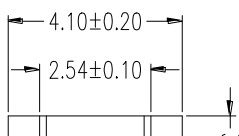
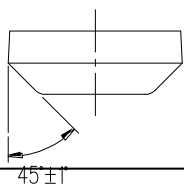
Part Number	Operating Temperature	Package	MOQ
CYD72X	-20 °C to +105 °C	SIP-3L	1000ea

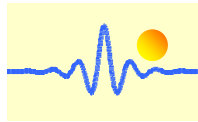


**Package Dimension (Unit: mm)**  
**SIP-3L(Pb Free)**

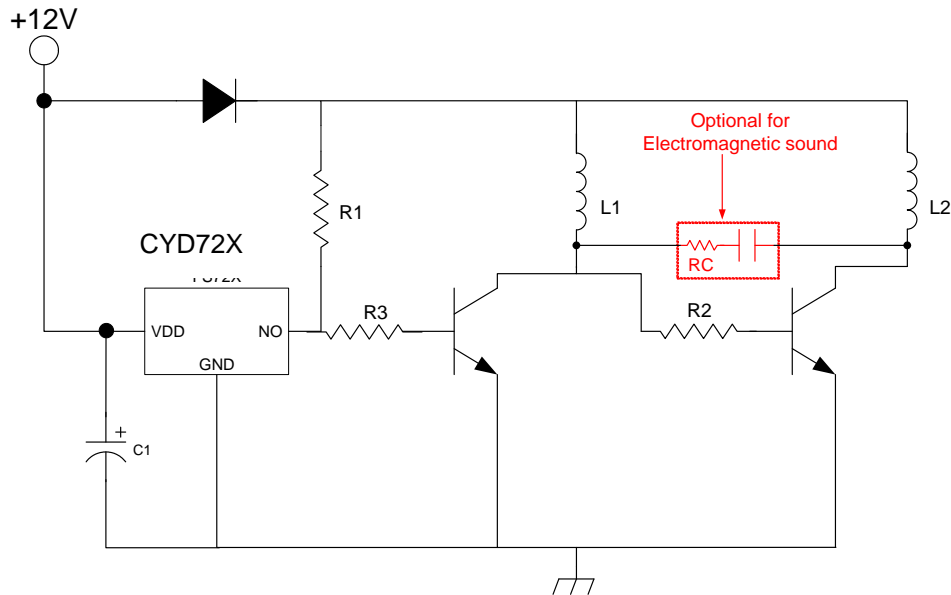


**Figure 6**





**Application Circuit (only Reference)**



**Brushless DC Fan**

**Figure 7**

**Note.** Detail information please check application note.  
Suggestion value: R1=1K $\Omega$ , R3=330 $\Omega$ , R=30 $\Omega$ , C=2.2 $\mu$ F, C1>0.1 $\mu$ F