

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

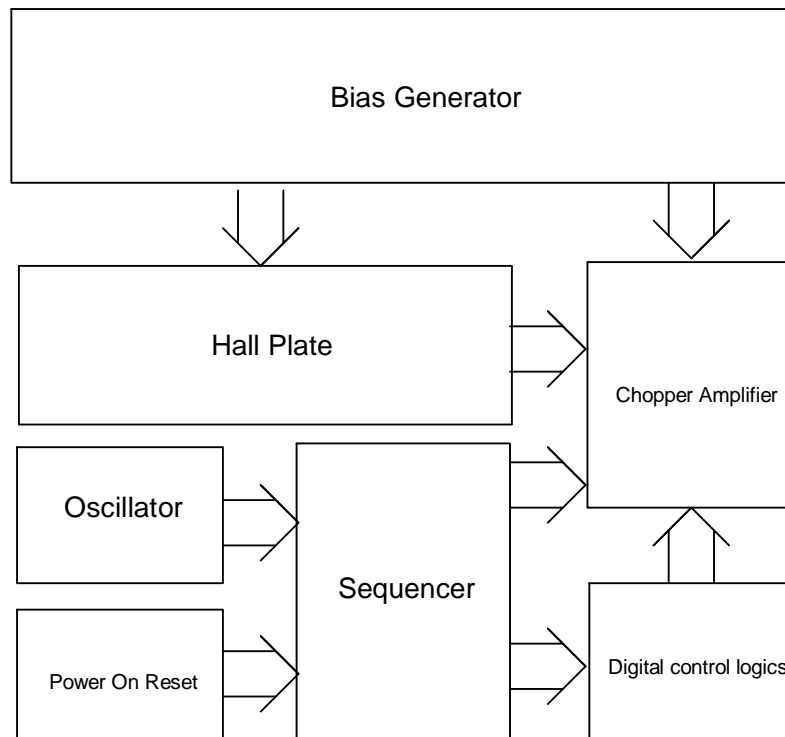
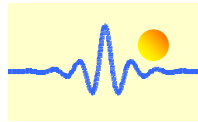


Figure 1



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

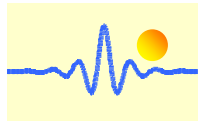
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Supply Voltage	V _{DD}	-	2.4		16	V
Operating Temperature Range	T _A	-	-20		105	°C

Electrical Characteristics V_{DD}=12.0V, T_A=25°C (unless otherwise specified)

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

Magnetic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operate Points	B _{OP}			+25		G
Release Points	B _{RP}			-25		G
Hysteresis	B _{HYST}			50		G



Hysteresis Characteristics

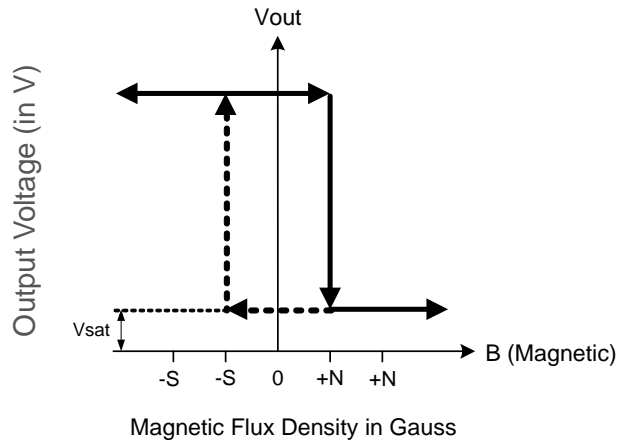


Figure 2

Absolute Maximum Ratings

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

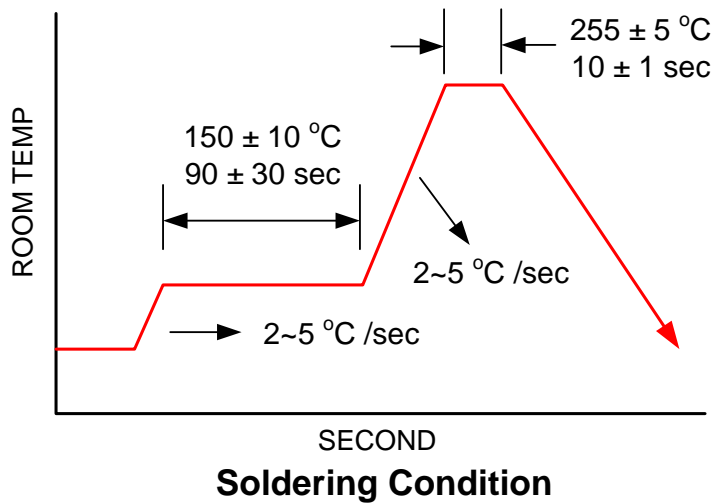
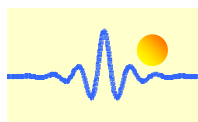


Figure 3



Pin Connection

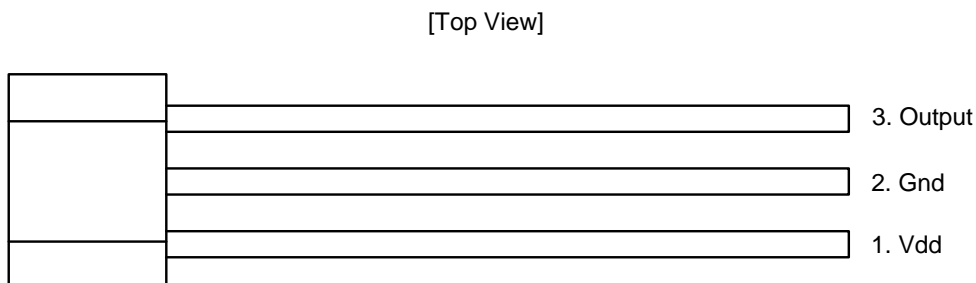


Figure 4

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

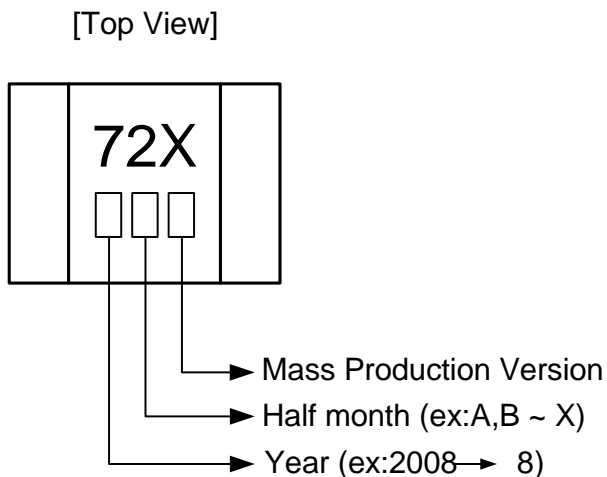
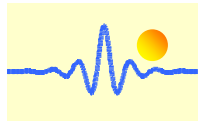


Figure 5

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)

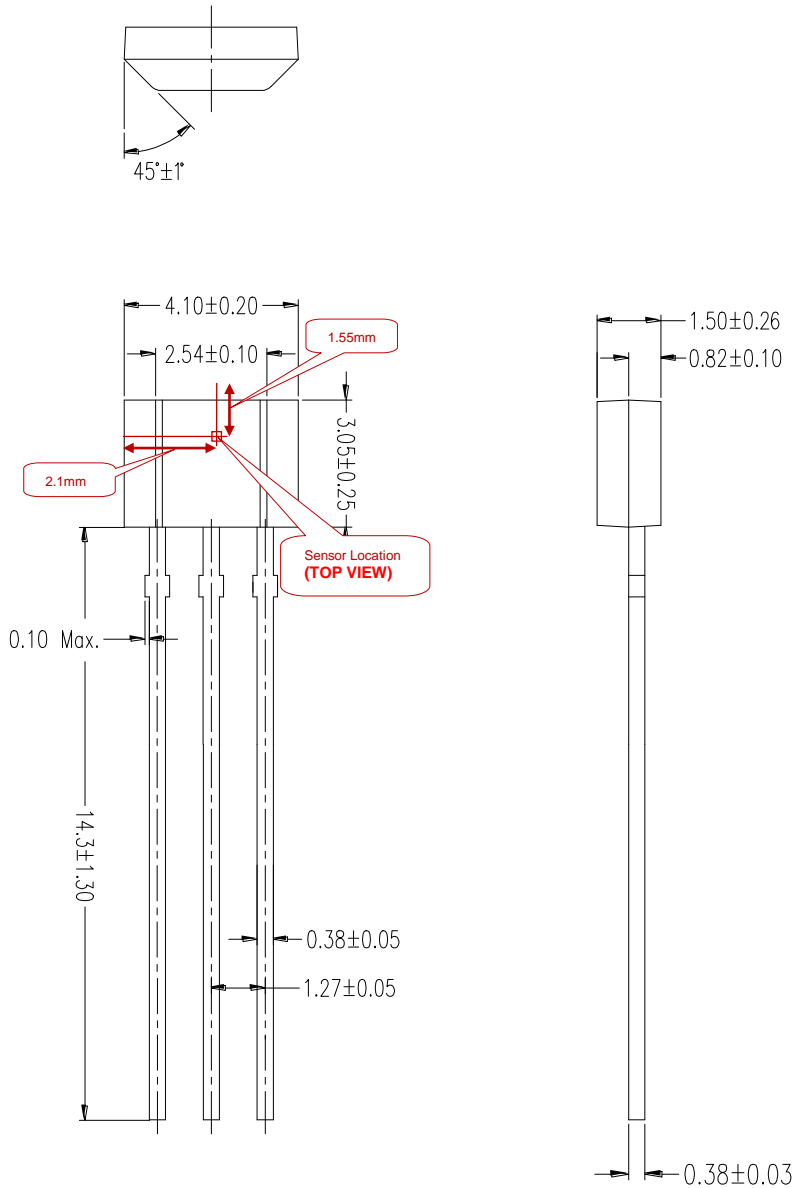
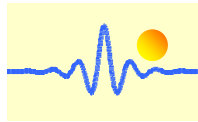
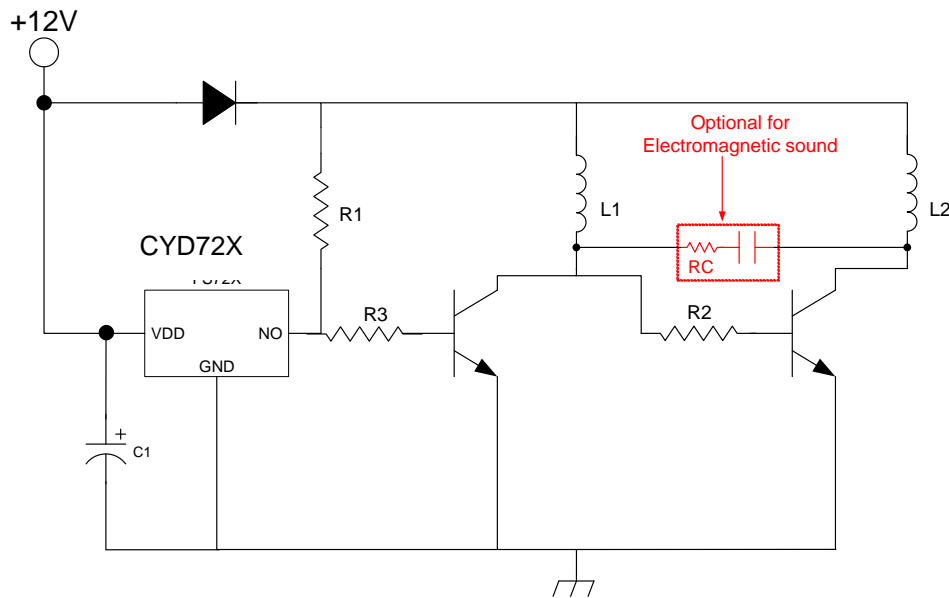


Figure 6



Application Circuit (only Reference)



Brushless DC Fan

Figure 7

Note. Detail information please check application note.
Suggestion value: R1=1K Ω , R3=330 Ω , R=30 Ω , C=2.2 μ F, C1>0.1 μ F