

Unipolar 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

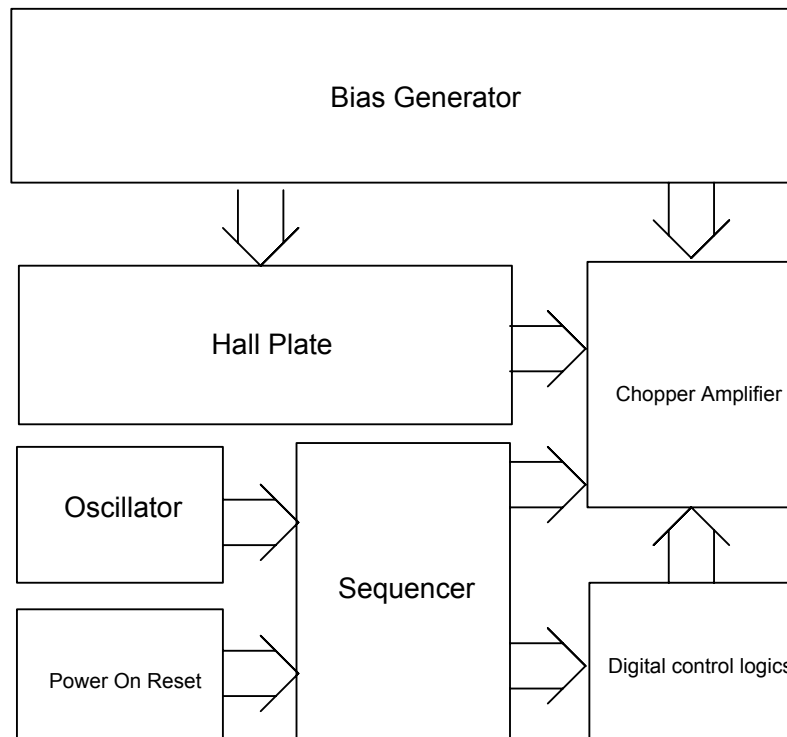


Figure 1

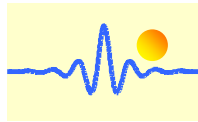
Functional Descriptions

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 $V_{DD}=12.0V$, $T_A=25^\circ C$ (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

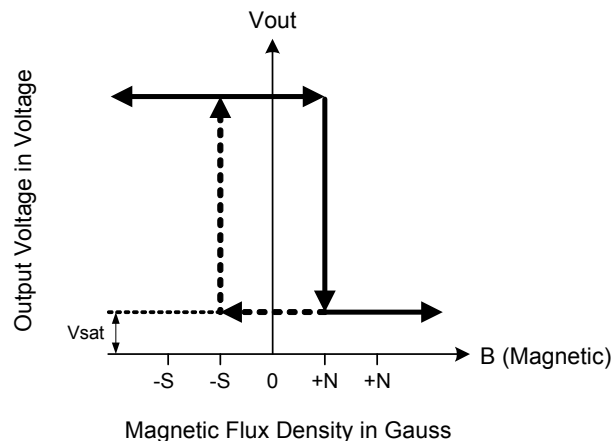
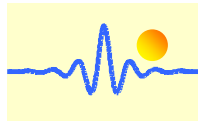


Figure 2



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

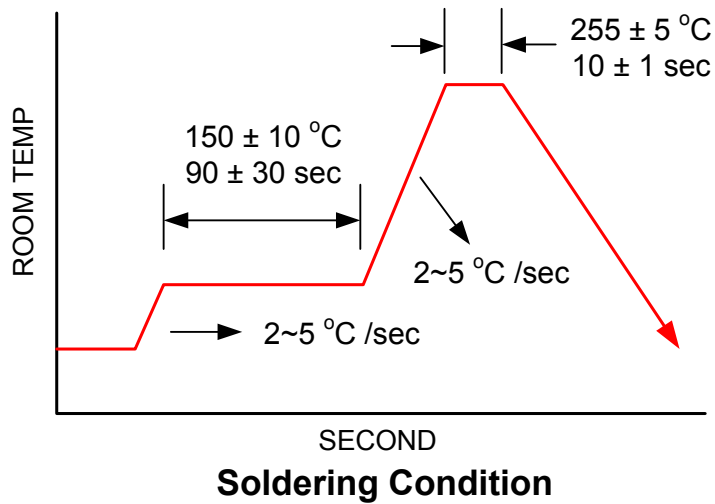
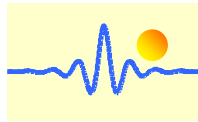


Figure 3



Pin Connection

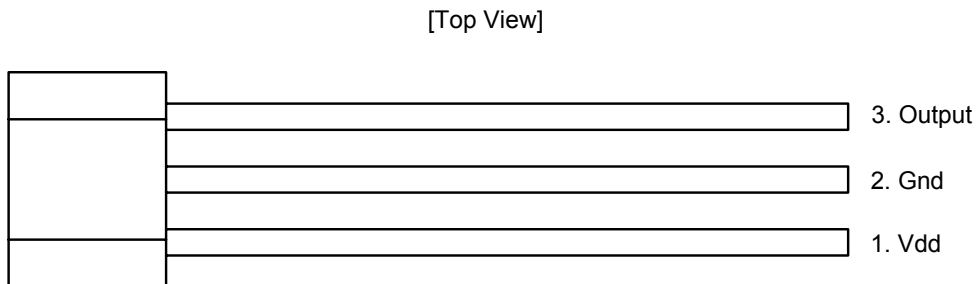


Figure 4

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

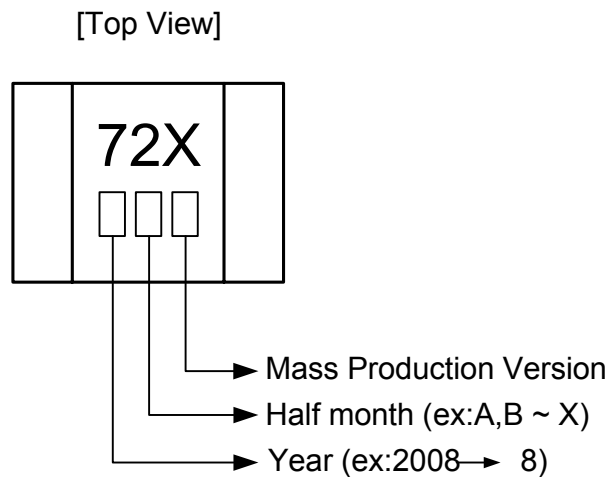
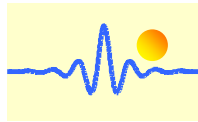


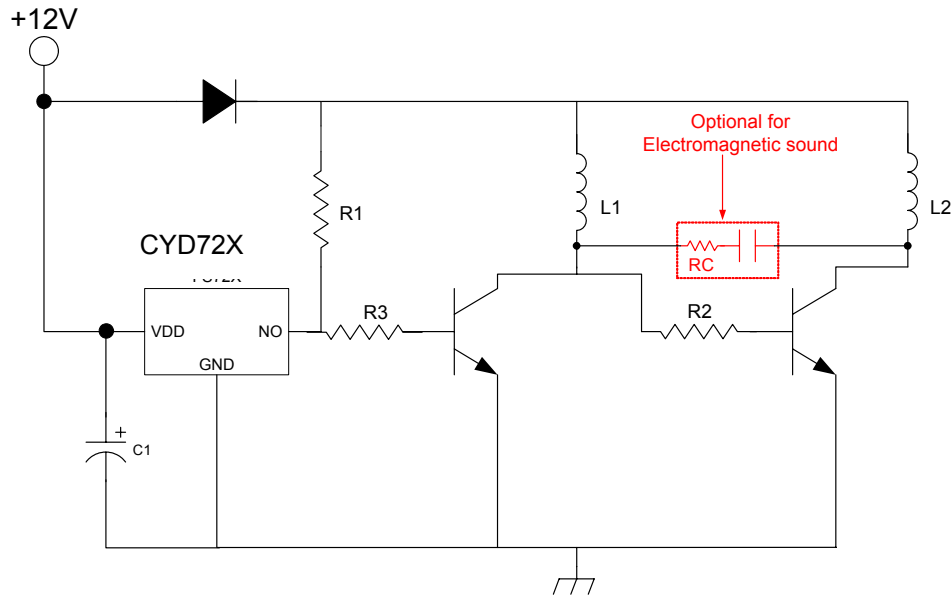
Figure 5

Order Information

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



Application Circuit Reference



Brushless DC Fan

Figure 7

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