

## HALL EFFECT BIPOLAR LATCHING SWITCH IC CYD3601

The CYD3601 is a bipolar Hall Effect switch with a latched digital output. The built-in dynamic offset cancellation of pre-amplifier stage achieves optimal symmetrical magnetic sensing. This Hall Effect IC is optimal for DC brushless fan applications. The supply voltage range is from 2.5V to 18V and maximum output current is 25mA.

### FEATURES

- 2.5V to 18V power supply
- Built-in dynamic offset cancellation
- Small size, convenient installing
- High balance and low thermal drift
- magnetic sensing
- **ROHS Compliant**

### TYPICAL APPLICATIONS

- Brushless DC motor
- VCD/DVD loader, CD/DVD-ROM
- Contactless switch
- Cover detector
- Speed measurement
- Home applications
- Home safety

### Ordering Information

Package	Ordering no.	Mark	Packing	Temperature range
SOT23-3L	CYD3601S	601	3000/reel	-40°C ~ +125°C
TO92-3L	CYD3601T	601	500-1000units/pack	-40°C ~ +125°C

### Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Supply voltage	$V_{CC}$	20	V
Max. power consumption	$P_D$	TO92-3L(T)=550, SOT23-3L(S)=300	mW
Operating temperature range	$T_A$	-40 ~ +125	°C
Storage temperature range	$T_S$	-50 ~ +150	°C
Max. Output current	$I_{omax}$	25	mA

### ELECTRICAL CHARACTERISTICS

$T_A=25^\circ\text{C}$ ,  $V_{DD}=12\text{V}$

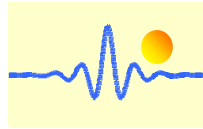
Parameter	Symbol	Test conditions	min	typical	max	Unit
Supply voltage	$V_{CC}$		2.5	-	18	V
Output sink voltage	$V_{OL}$	$I_{out}=15\text{mA}$	-	0.3	0.5	V
Output Breakdown voltage	$V_{BV}$		18	22	30	V
Supply current	$I_{DD}$	Output open@12V	-	6	8	mA

### MAGNET CHARACTERISTICS

( $V_{DD}=12\text{V DC}$ ,  $T_A=+25^\circ\text{C}$ )

Parameter	Symbol	min	typical	max	Unit
Operating point	$B_{CP}$	-	30	60	Gauss
Release point	$B_{RP}$	-60	-30	-	Gauss
Hysteresis	$B_H$	20	60	100	Gauss

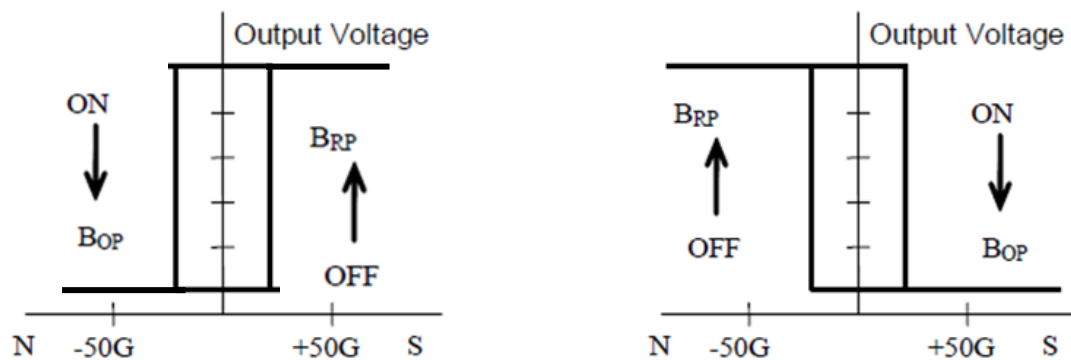
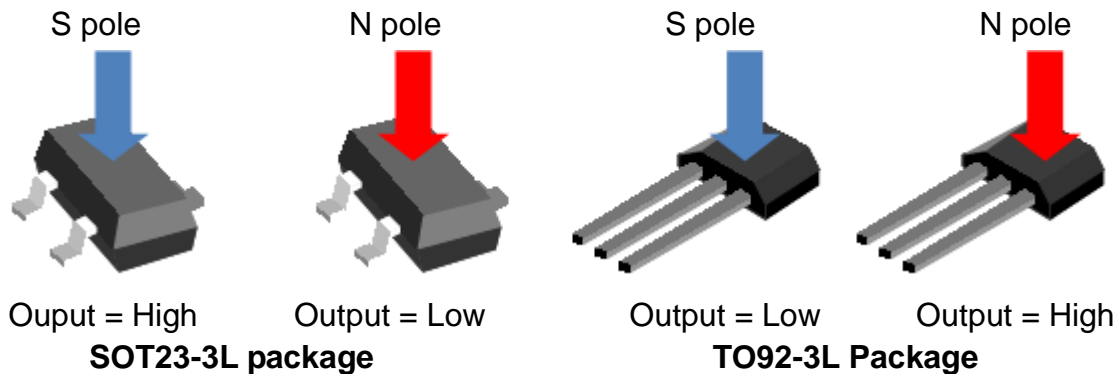
**NOTE:** Need a serial resistor for 24V application,  $1\text{mT}=10\text{GS}$



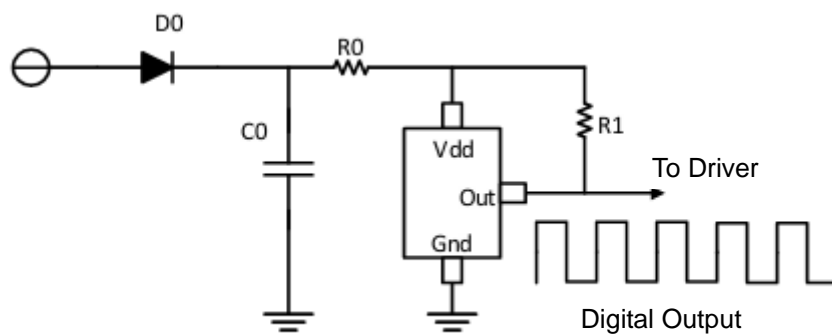
### Relation between output and applied magnetic field B

( $T_A = -40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ ,  $V_{DD} = 2.5 \sim 18\text{VDC}$ )

Part number	CYD3601S (SOT23-3L)		CYD3601T (TO92-3L)	
Parameter	Condition	Output	Condition	Output
S pole	$B < B_{rp}$	High	$B > B_{op}$	Low
N pole	$B > B_{op}$	Low	$B < B_{rp}$	High

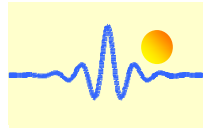


### Application circuit

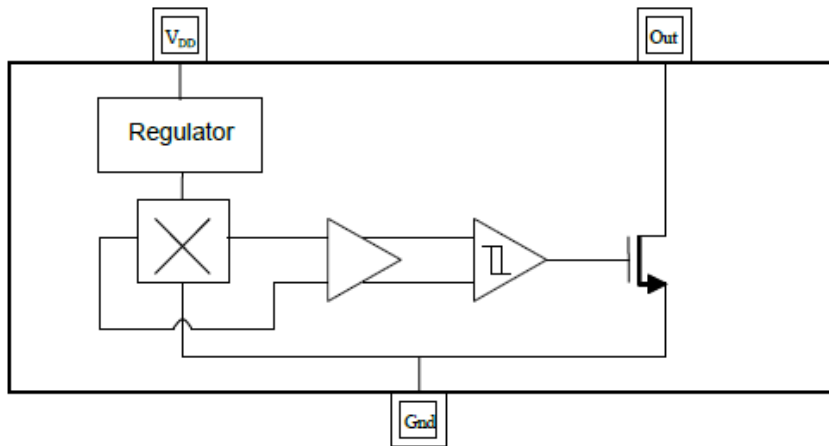


#### NOTE:

- D0: general diode
- C0: decoupling capacitor  $1\mu\text{F}$  (recommended)
- R0:  $1\text{k}\Omega$ ,  $0.5\text{W}$  for power supply  $+24\text{VDC}$ ,  $0\Omega$  for power supply  $5\text{V}$ ,  $12\text{V}$  and  $15\text{VDC}$
- R1:  $0\text{k}\Omega$  (recommended)

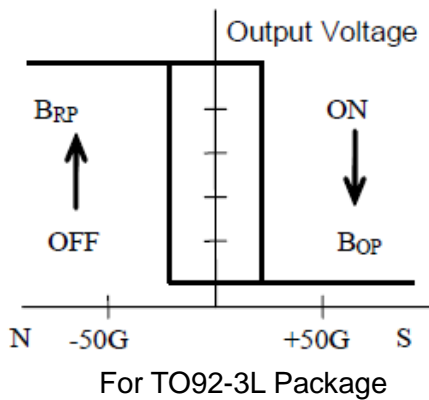


**BLOCK DIAGRAM**

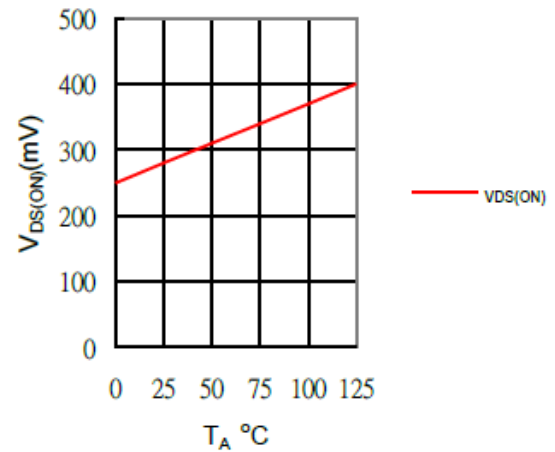


This Hall Effect Switch IC integrates the sensor, Pre-amplifier with dynamic offset cancellation and hysteresis comparator in single chip.

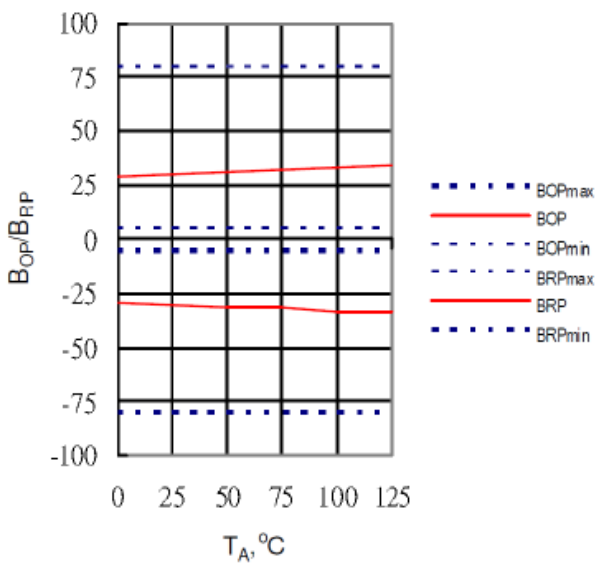
**Magnetic-electrical transfer characteristics**



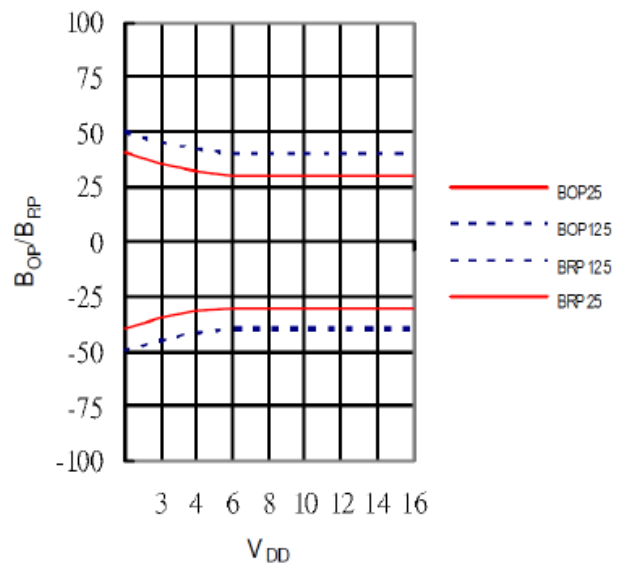
**Output sink voltage versus temperature**

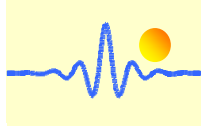


**B<sub>OP</sub>, B<sub>RP</sub>(Gauss) versus Temperature**

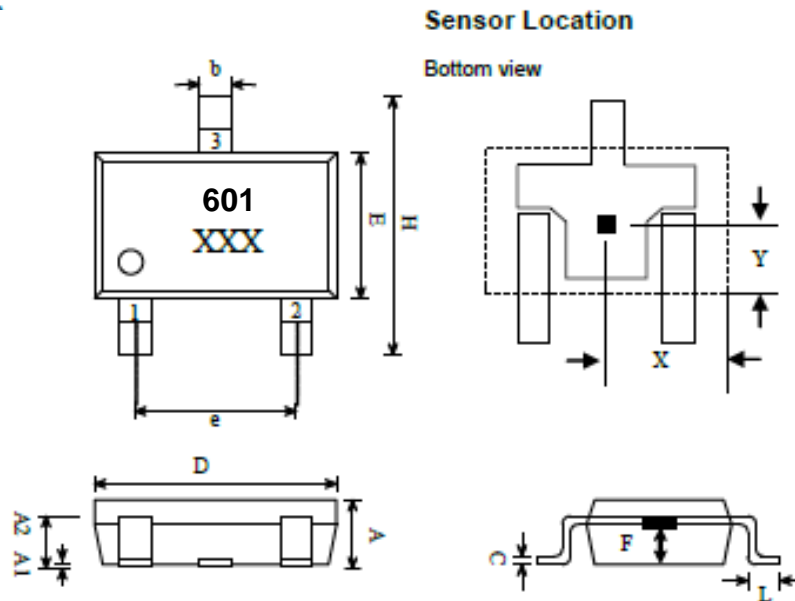


**B<sub>OP</sub>, B<sub>RP</sub>(Gauss) versus supply voltage**





**Package Outline SOT23-3L(S)**



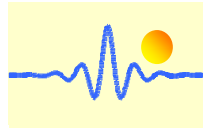
**Marking:**

**Part Number:** 601

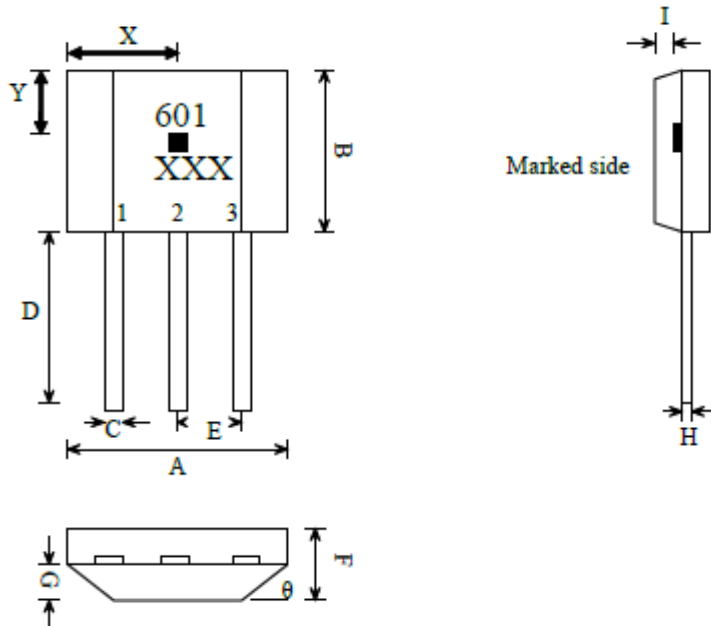
**Date Code:** X(year) XX(Week)

- 1. VDD/DC power supply
- 2. OUT/output pin
- 3. GND/DC ground

SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	1.00	1.10	1.30
A1	0.00	-	0.10
A2	0.70	0.80	0.90
b	0.35	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	1.40	1.80	2.00
H	2.60	2.8	3.00
e	1.7	1.9	2.1
L	0.20	-	-
<b>Sensor Location</b>			
X	1.35	1.45	1.55
Y	0.85	0.95	1.05
F	0.35	0.50	0.65



**Package Outline T092-3L(T)**



Marking:  
Part Number : 601  
Date Code : X(Year) XX(Week)

1. VDD/DC power supply
2. GND/DC ground
3. OUT/output pin

SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	3.80	4.00	4.20
B	2.90	3.10	3.30
C	0.38	0.45	0.52
D	14.40	14.60	14.80
E	1.24	1.27	1.30
F	1.45	1.50	1.55
G	0.68	0.73	0.78
H	0.36	0.43	0.50
I	0.41	0.43	0.45
θ		45°	
Sensor Location			
X	1.90	2.00	2.10
Y	0.90	1.00	1.10