

HALL EFFECT BIPOLAR LATCHING SWITCH IC CYD3601A

The CYD3601A 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

Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Supply voltage	V_{CC}	20	V
Max. power consumption	P_D	TO92-3L(UA)=550, SOT23-3L(LH)=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

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

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

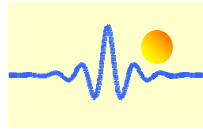
MAGNET CHARACTERISTICS

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

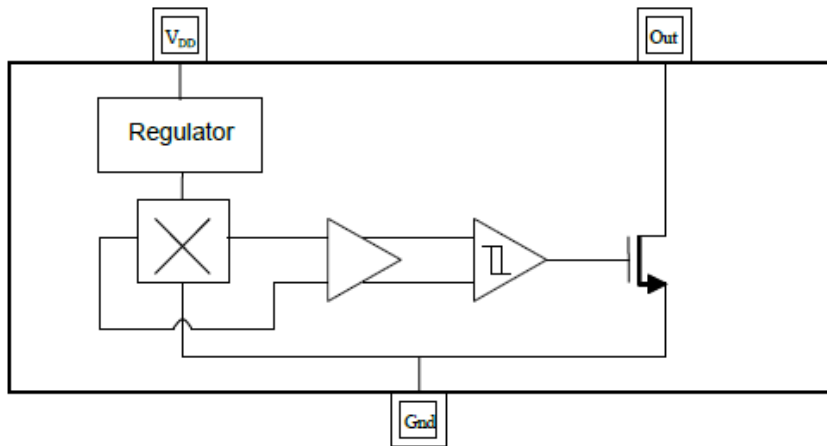
Parameter	Symbol	min	typical	max	Unit
Operating point	B_{OP}	-	15	35	Gauss
Release point	B_{RP}	-35	-15	-	Gauss
Hysteresis	B_H	20	30	60	Gauss

* Need a serial resistor for 24V application

NOTE: 1mT=10GS

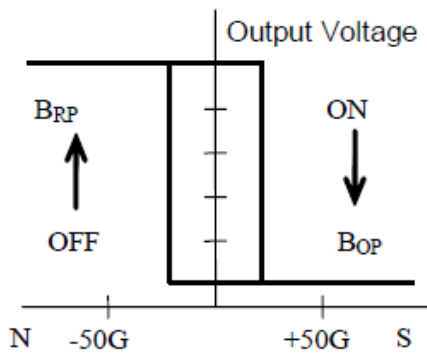


BLOCK DIAGRAM

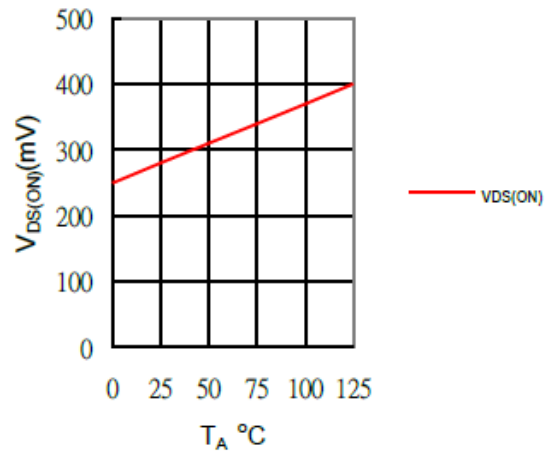


This Hall Effect Switch IC integrates the sensor, Pre-amplifier with dynamic offset cancellation and hysteresis comparator in single chip.

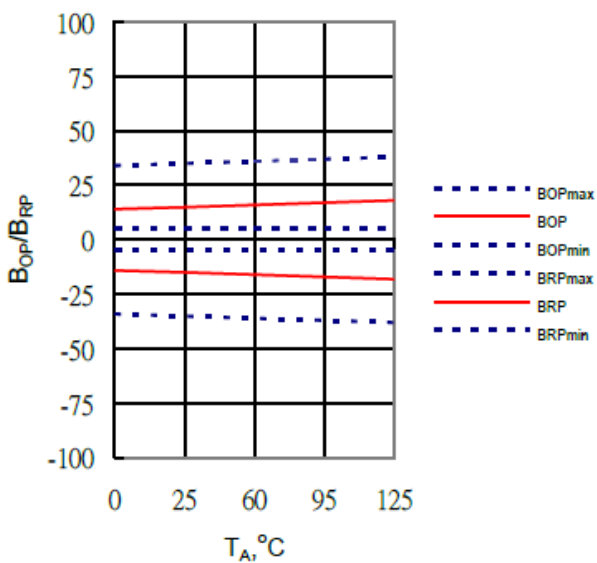
Magnetic-electrical transfer characteristics



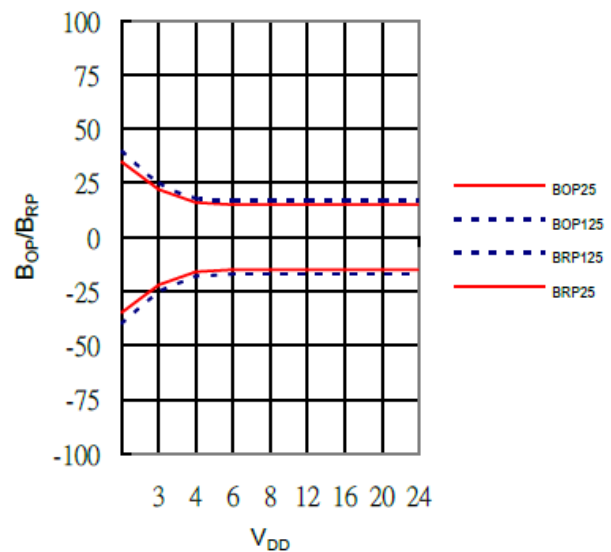
Output sink voltage versus temperature

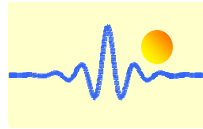


B_{OP}, B_{RP}(Gauss) versus Temperature

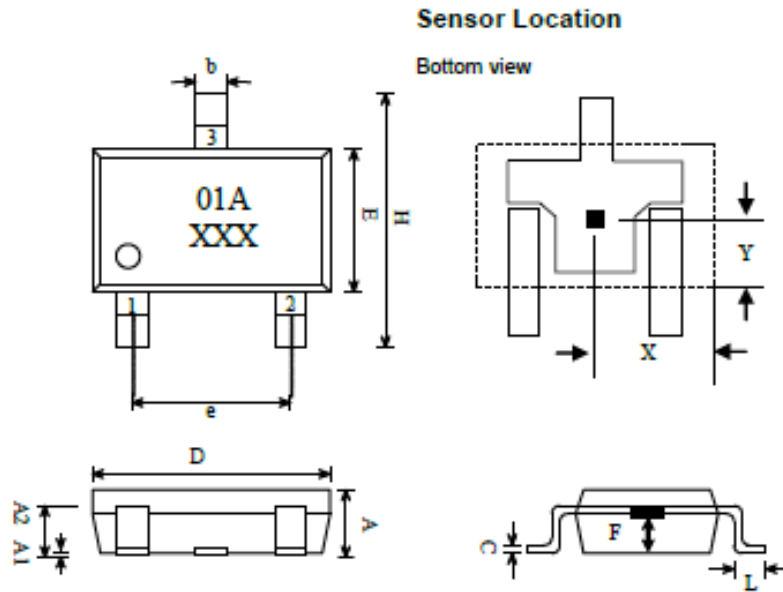


B_{OP}, B_{RP}(Gauss) versus supply voltage





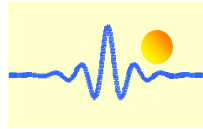
Package Outline SOT23-3L(LH)



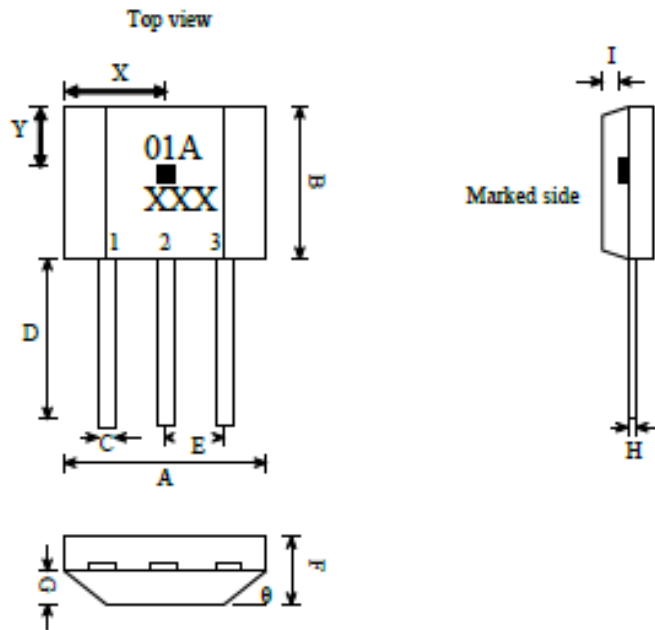
Marking:
Part Number : 01A
Date Code : X(Year) XX(Week)

- 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	-	-
Sensor Location			
X	1.35	1.45	1.55
Y	0.85	0.95	1.05
F	0.35	0.50	0.65



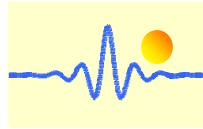
Package Outline T092-3L(UA)



Marking:
Part Number : 01A
Date Code : X(Year) XX(Week)

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

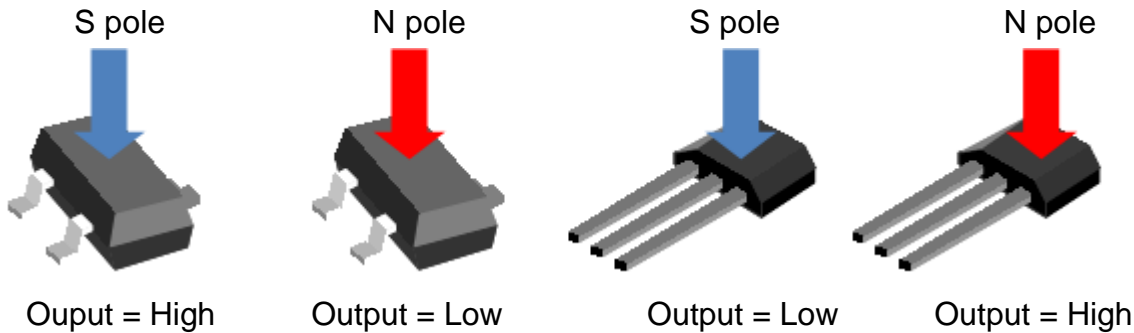
SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	3.80	4.00	4.20
B	2.90	3.10	3.30
C	0.38	0.45	0.52
D	14.40	14.60	14.80
E	1.24	1.27	1.30
F	1.45	1.50	1.55
G	0.68	0.73	0.78
H	0.36	0.43	0.50
I	0.41	0.43	0.45
θ		45°	
Sensor Location			
X	1.90	2.00	2.10
Y	0.90	1.00	1.10



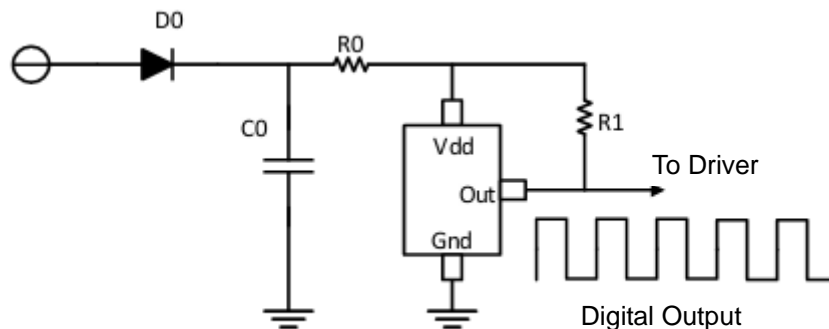
Relation between output and applied magnetic field B

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

Part number	CYD3601A-LH (SOT23-3L)		CYD3601A-UA (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: $1\text{k}\Omega$, 0.5W for power supply $+24\text{VDC}$, 0Ω for power supply 5V , 12V and 15VDC
- R1: $0\text{k}\Omega$ (recommended)

Ordering Information

Package	Ordering no.	Mark	Packing	Temperature range
SOT23-3L	CYD3601A-LH	01A	3000/reel	$-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
TO92-3L	CYD3601A-UA	01A	500-1000units/pack	$-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$