ChenYang
Technologies GmbH & Co. KG

CYD3661-BC Micropower Ultra-Sensitivity Hall Effect Sensors
(Omni-polar)

The CYD3661-BC is ultra-sensitive, pole independent Hall-Effect switches with a latched digital output. It is very suitable for operation in battery-operated, hand-held equipment such as cellular and cordless phone, PDA, pagers palmtop computers. The built-in dynamic offset cancellation of pre-amplifier stage achieves optimal symmetrical magnetic sensing. The supply voltage range is from 2.4V to 6.0V and the max output current is 5mA。
Unlike other Hall-effect switches, either a north or south pole of sufficient strength will turn the output on. In the absence of a magnetic field, the output is off. The polarity independence and minimal power requirement allows this device to easily replace reed switches for superior reliability.

APPLICATIONS

- Cover detector
- Battery-operated
- Hand-held equipment
- Door sensors

FEATURES

- Micro-power operation (5-7µW), **Omni-polar**
- 2.4V to 6.0V power supply
- Built-in dynamic offset cancellation
- Thin SOT package
- ESD protected to 5KV
- High balance and low thermal drift magnetic sensing
- **ROHS compliant**

ABSOLUTE MAX. RATINGS (T_A=25°C)

Parameter	Symbol	Condition	Value	Units
Supply voltage	$V_{DD(MAX)}$		7	V
Allowable power dissipation	Pd	SOT23	300*	mW
Storage temperature	T_S		-55 ~ +150	°C
Operating temperature	Ta		-40 ~ +85	°C
Output current	I_{out}		5	mA

* On 50mm x 50mm x 1.6mm glass epoxy board

ELECTRICAL CHARACTERISTICS T_A=25°C, V_{DD}=3.0V

Parameter	Symbol	Test condition	Value			Units
			Min.	Typ.	Max..	
Supply voltage	V_{DD}		2.4	3.0	6.0	V
Output sink voltage	V_{DS}	I_{out}=1mA, V_{DD}=3.0V	-	0.1	0.25	V
Supply current	I_{AWK}	Awake, V_{DD}=3.0V	-	3	5	mA
	I_{SLP}	Sleep, V_{DD}=3.0V		2	4	µA
	I_{AVG}	V_{DD}=3.0V		5	9	µA
Awake time	T_{AWK}	Operating		45	90	µS
Period	T_P	Operating		90	180	mS
Duty cycle				0.05		%

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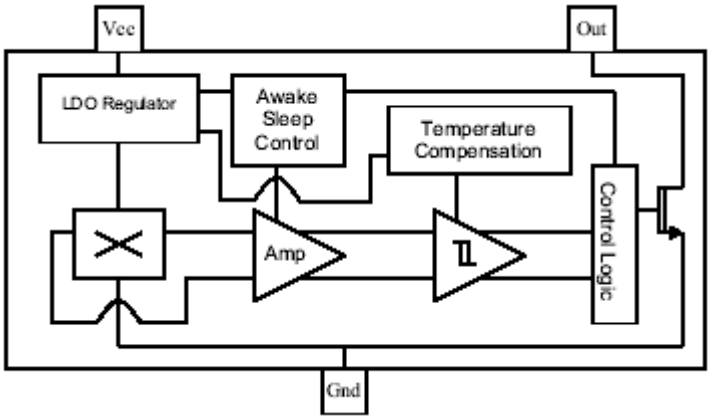
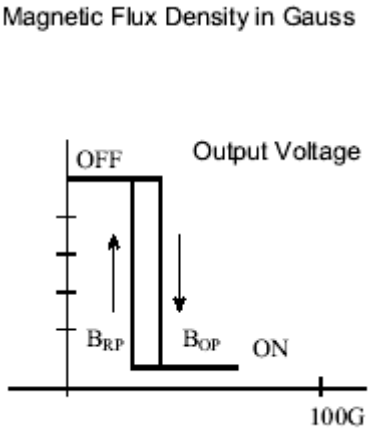
Magnetic Characteristics

T_A=25°C, V_{DD}=3.0V

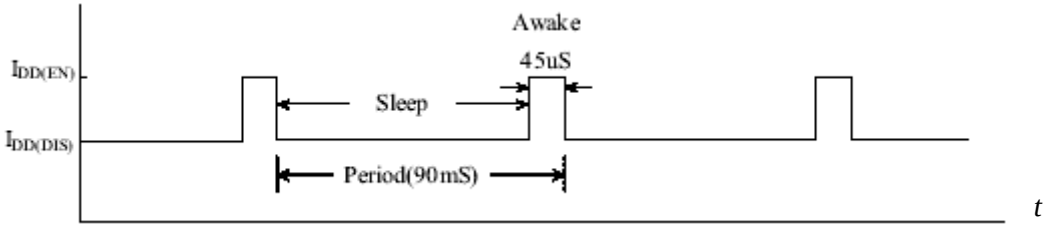
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Operation Point	B_{OP}	S pole	18		47	GS
Release Point	B_{RP}	S pole	14		43	
Operation Point	B_{ON}	N pole	-35		-55	
Release Point	B_{RN}	N pole	-27		-46	GS
Hysteresis	B_H	I B_{OP} - B_{RN} I		6		GS

BLOCK DIAGRAM

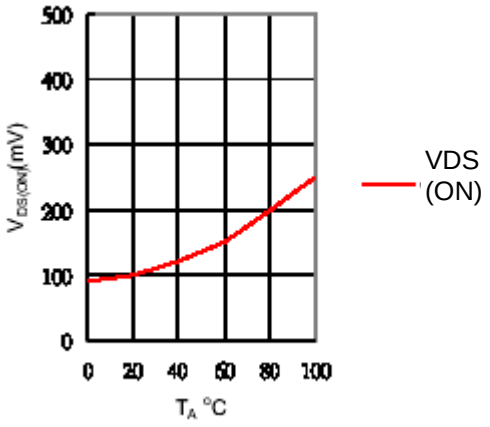




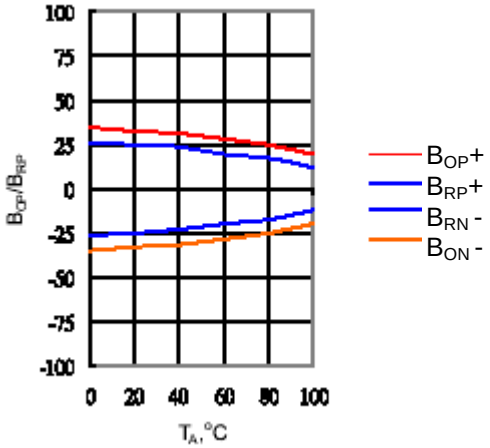
The micro power operation is realised by an awake/sleep timing control as shown in the following figure. Internal timing circuitry activates the sensor for 45µs and deactivates it for the remainder of the period (90ms). A short awake time allows for stabilization prior to the sensor sampling and data latching on the falling edge of the timing pulse. The output during the sleep time is latched in the last sampled state. The supply current is not affected by the output state.



Output sink voltage versus temperature



B_{OP}, B_{RP} Versus Temperature



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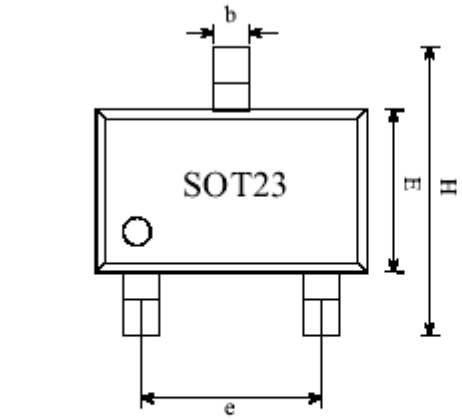
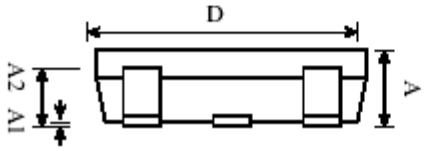
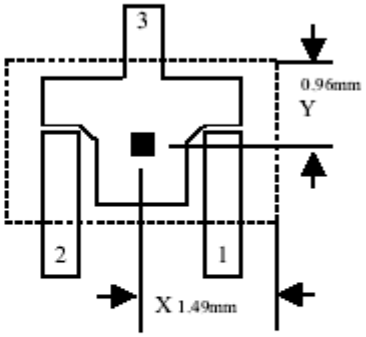
Package Outline

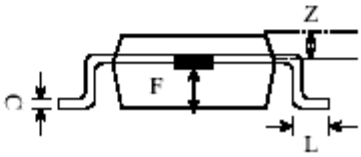




Sensor Location

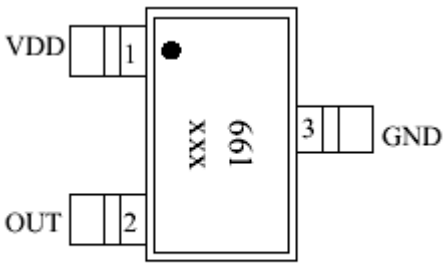
Bottom view





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	1.60	1.80	2.00
F	0.55	0.60	0.65
H	2.60	2.8	3.00
e	1.7	1.9	2.1
L	0.20	-	-
SENSOR LOCATION			
X	-	0.96	-
Y	-	1.49	-
Z	-	0.50	-

SOT-23



XXX: Date Code

Pin Description

Name	Pin	Description
VDD	1	DC power supply
OUT	2	Output pin
GND	3	DC ground

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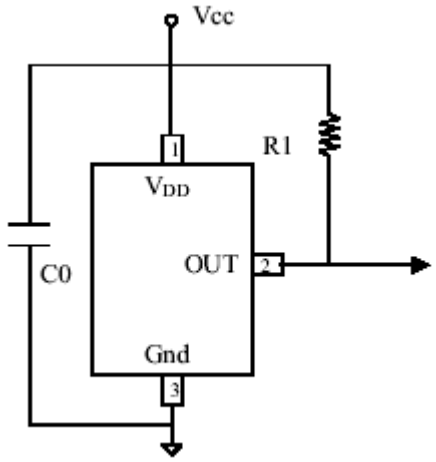
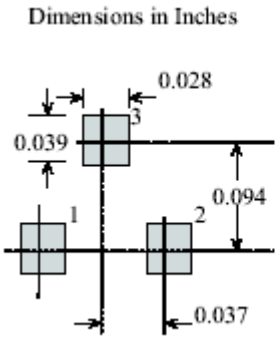
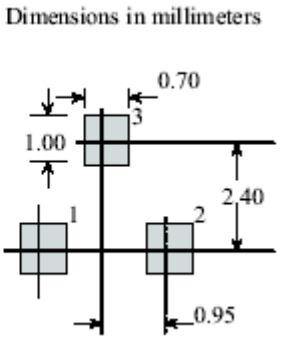
APPLICATION CIRCUITS



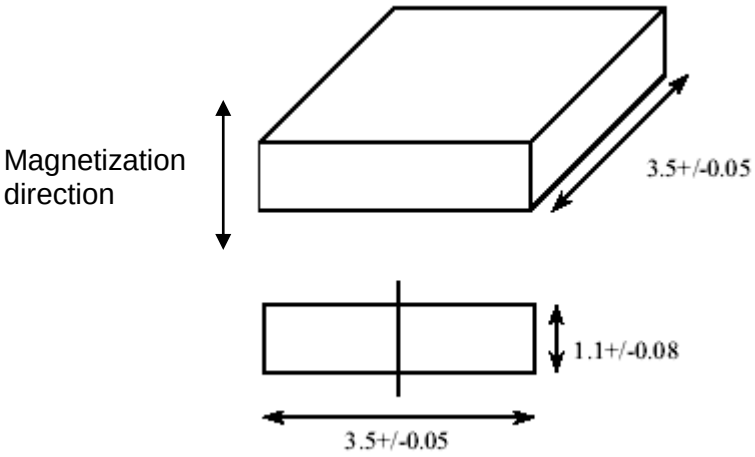
Solder-Pad Layout





NOTE:

C0: 0.1µF decoupling capacitor
R1: >470 kΩ is recommended

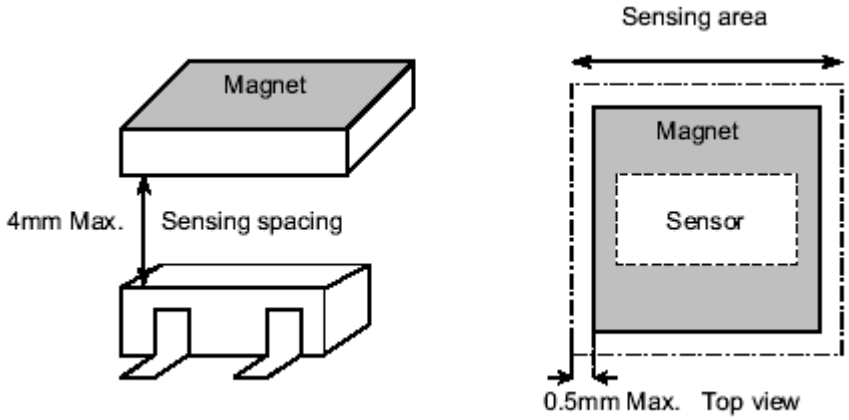


APPLICATION NOTES

Magnet Characteristic

Dimensions (mm)

Recommended Sensing Location



Ordering Information

Part no.	Mark	Package/Packing	Temperature range
CYD3661-BC	661	SOT-23 / 3000units/reel	-40°C ~ +85°C

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