



## UH8102

CMOS IC

### LOW POWER HALL EFFECT SWITCH

#### DESCRIPTION

**UH8102** is a low-power integrated Hall switch designed to sense the applied magnetic flux density and give a digital output, which indicates the present condition of the magnitude sensed.

It mainly designed for battery-powered system and hand-held equipment, such as cellular flip-phones and PDA's, in which power consumption is one major concern. The typical power consumption of UH8100 at down to 10uW in 2.7V supply.

For **UH8102A**, the output will be at the "Low" level when no magnetic field is applied. When the applied magnetic flux density is stronger than the switching threshold, the output would be at the "High" level.

For **UH8102B**, the output will be at the "High" level when no magnetic field is applied. When the applied magnetic flux density is stronger than the switching threshold, the output would be at the "Low" level.

#### FEATURES

\*Micropower Operation

\*2.4V to 5.5V Battery Operation

\*Offset Canceling Technology

\*Superior Temperature Stability

\*Extremely Low Switch-Point Drift

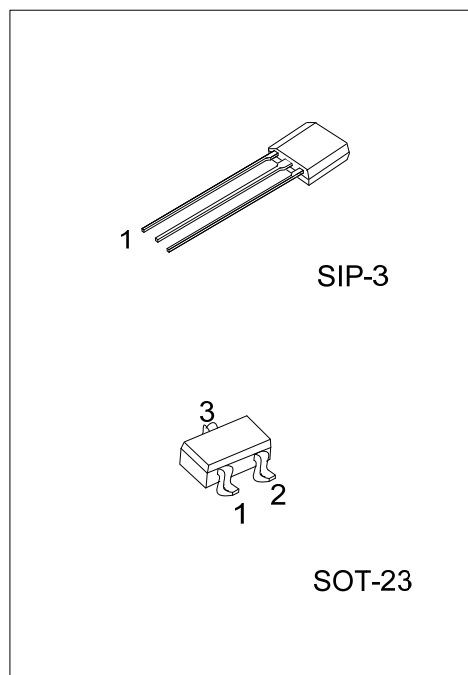
\*Insensitive to Physical Stress

#### ORDERING INFORMATION

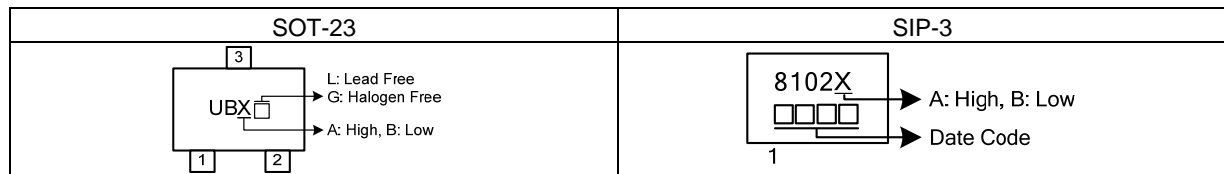
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UH8102XL-AE3-R	UH8102XG-AE3-R	SOT-23	I	O	G	Tape Reel
UH8102XL-G03-B	UH8102XG-G03-B	SIP-3	I	G	O	Tape Box
UH8102XL-G03-K	UH8102XG-G03-K	SIP-3	I	G	O	Bulk

Note: Pin Assignment: I:  $V_{DD}$  O: Output G: GND

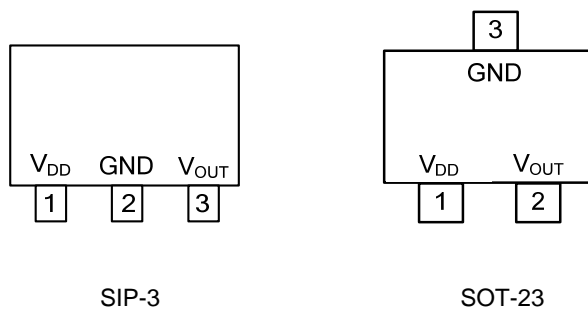
UH8102XG-AE3-R	(1) Packing Type	(1) B: Tape Box, K: Bulk, R: Tape Reel
	(2) Package Type	(2) AE3: SOT-23, G03: SIP-3
	(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free
	(4) No Magnetic Field	(4) A: Low, B: High



## MARKING



## PIN CONFIGURATION

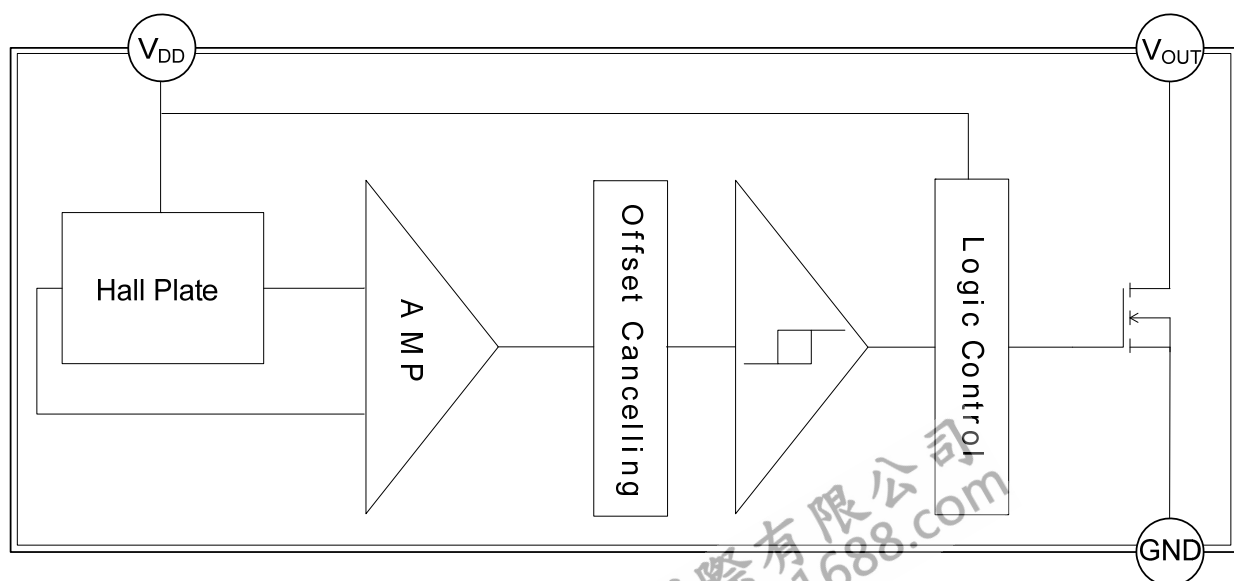


## PIN DESCRIPTION

PIN NAME	PIN TYPE	PIN DESCRIPTION
$V_{DD}$	P	Power Supply
$V_{OUT}$	O	Digital Output
GND	G	Ground

Note: O: Output, P: Power Supply, G: Ground.

## BLOCK DIAGRAM



# ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Magnetic Flux Density		B	Unlimited	mT
Supply Voltage		V <sub>DD</sub>	5.5	V
Supply current		I <sub>Q</sub>	-1 ~ +2.5	mA
Power Dissipation	SIP-3	P <sub>D</sub>	400	mW
	SOT-23		200	mW
Junction Temperature		T <sub>J</sub>	+150	°C
Operation Temperature		T <sub>OPR</sub>	-40 ~ +85	°C
Storage Temperature		T <sub>STG</sub>	-40 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

# ■ RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V <sub>DD</sub>	Operating	2.4	2.7	5.5	V
Output Voltage	V <sub>OUT</sub>		-0.3	2.7	5.5	V
Ambient Temperature	T <sub>A</sub>		-40	25	85	°C

# ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Saturation Voltage	V <sub>SAT</sub>	V <sub>DD</sub> =2.7V		0.1		V
Output Leakage Current	I <sub>OFF</sub>			0.01		uA
Supply Current	I <sub>DD(EN)</sub>	V <sub>DD</sub> =2.7V	Chip enable	1.1		mA
	I <sub>DD(DIS)</sub>		Chip disable	2.5		uA
	I <sub>DD(AVG)</sub>		Average supply current	3	20	uA
Operating Time	T <sub>OP</sub>	V <sub>DD</sub> =2.7V		60		us
Standby Time	T <sub>SD</sub>			150		ms
Duty Cycle	D.C.			0.04		%

# ■ MAGNETIC CHARACTERISTICS (V<sub>DD</sub>=2.7V, T<sub>A</sub>=25°C, unless otherwise specified)

For UH8102A (**LOW** level when no magnetic field is applied)

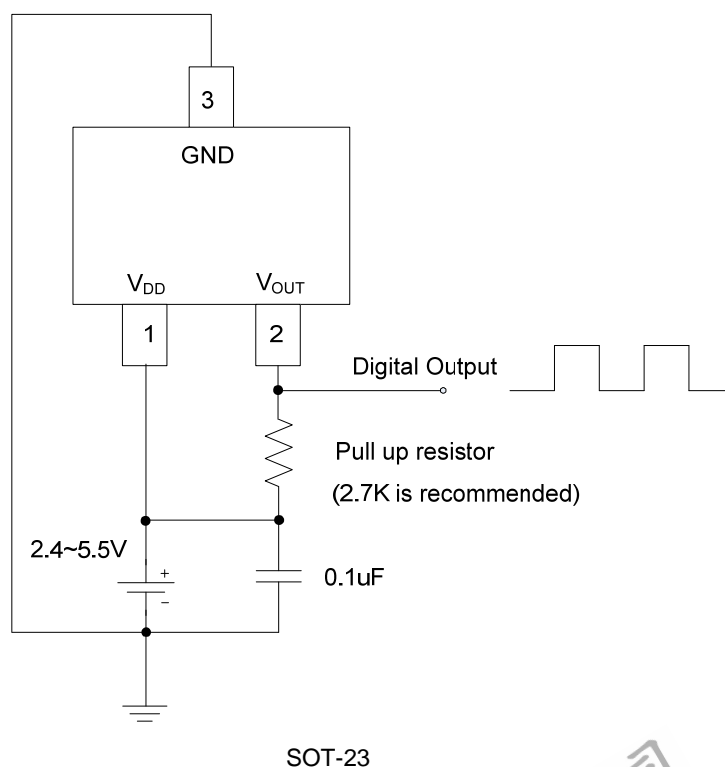
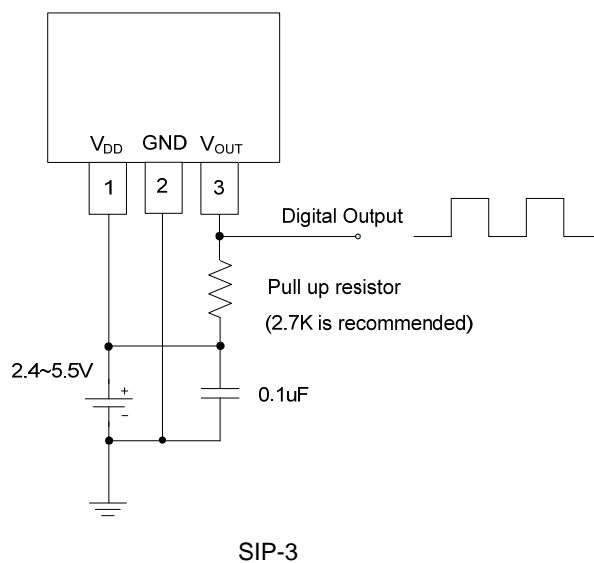
Rank	PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
1	Operation Points	B <sub>OP</sub>	South or North pole to branded side,  B  >  B <sub>OP</sub>  , V <sub>OUT</sub> On	8		23	Gauss
	Release Points	B <sub>RP</sub>	South or North pole to branded side,  B  <  B <sub>RP</sub>  , V <sub>OUT</sub> Off	10		25	
	Hysteresis	B <sub>OP</sub> -B <sub>RP</sub>	B <sub>OPX</sub> -B <sub>RPX</sub>		10		
2	Operation Points	B <sub>OP</sub>	South or North pole to branded side,  B  >  B <sub>OP</sub>  , V <sub>OUT</sub> On	15		35	Gauss
	Release Points	B <sub>RP</sub>	South or North pole to branded side,  B  <  B <sub>RP</sub>  , V <sub>OUT</sub> Off	20		40	
	Hysteresis	B <sub>OP</sub> -B <sub>RP</sub>	B <sub>OPX</sub> -B <sub>RPX</sub>		10		
3	Operation Points	B <sub>OP</sub>	South or North pole to branded side,  B  >  B <sub>OP</sub>  , V <sub>OUT</sub> On	1			Gauss
	Release Points	B <sub>RP</sub>	South or North pole to branded side,  B  <  B <sub>RP</sub>  , V <sub>OUT</sub> Off			70	
	Hysteresis	B <sub>OP</sub> -B <sub>RP</sub>	B <sub>OPX</sub> -B <sub>RPX</sub>		10		

■ MAGNETIC CHARACTERISTICS(Cont.)

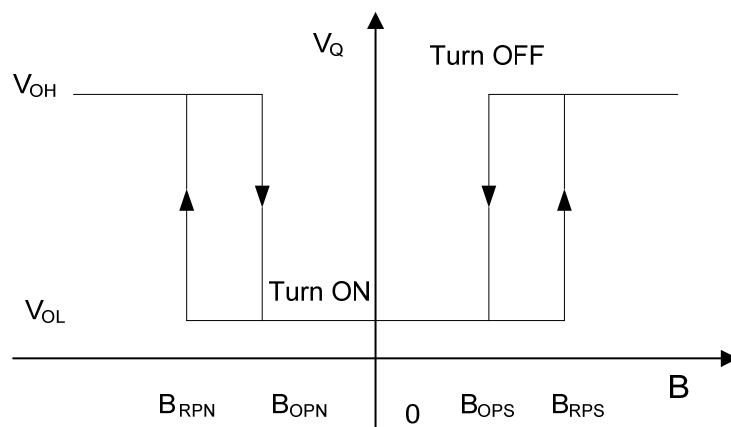
For UH8102B (**HIGH** level when no magnetic field is applied)

Rank	PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
1	Operation Points	$ B_{OP} $	South or North pole to branded side, $ B  >  B_{OP} $ , $V_{OUT}$ On	10		25	Gauss
	Release Points	$ B_{RP} $	South or North pole to branded side, $ B  <  B_{RP} $ , $V_{OUT}$ Off	8		23	
	Hysteresis	$ B_{OP}-B_{RP} $	$ B_{OPX}-B_{RPX} $		10		
2	Operation Points	$ B_{OP} $	South or North pole to branded side, $ B  >  B_{OP} $ , $V_{OUT}$ On	20		40	Gauss
	Release Points	$ B_{RP} $	South or North pole to branded side, $ B  <  B_{RP} $ , $V_{OUT}$ Off	15		35	
	Hysteresis	$ B_{OP}-B_{RP} $	$ B_{OPX}-B_{RPX} $		10		
3	Operation Points	$ B_{OP} $	South or North pole to branded side, $ B  >  B_{OP} $ , $V_{OUT}$ On			70	Gauss
	Release Points	$ B_{RP} $	South or North pole to branded side, $ B  <  B_{RP} $ , $V_{OUT}$ Off	1			
	Hysteresis	$ B_{OP}-B_{RP} $	$ B_{OPX}-B_{RPX} $		10		

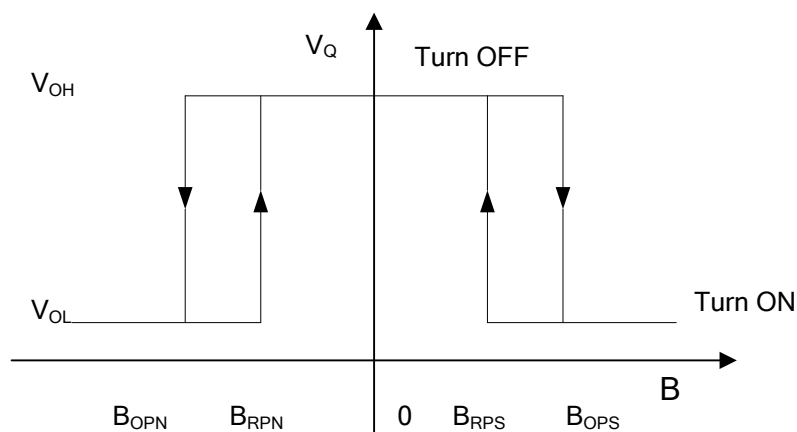
■ TYPICAL APPLICATION CIRCUIT



■ MAGNETIC FLUX



UH8102A (**LOW** level when no magnetic field is applied)



UH8102B (**HIGH** level when no magnetic field is applied)

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