



## UH8100

CMOS IC

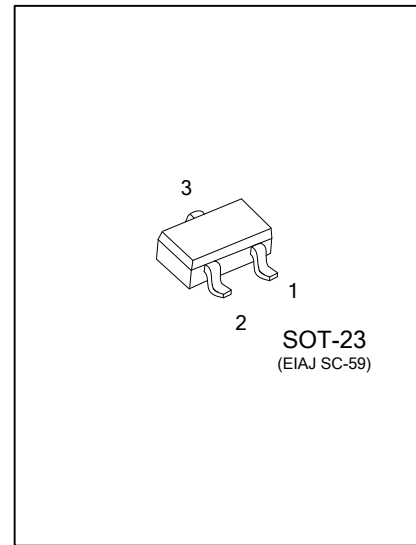
### LOW POWER HALL EFFECT SWITCH

#### DESCRIPTION

**UH8100** 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** is down to 15uW at 2.75V supply.

For **UH8100**, the output will be high when no magnetic field is applied and be low when the applied magnetic flux density is stronger than the switching threshold. The difference between **UH8100A** and **UH8100B** is that **UH8100A** consumes less power than **UH8100B** in the Hall sensor operation.



#### FEATURES

- \* Micro power Operation
- \* 2.5V 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   |
|-----------------|---------|----------------|---|---|-----------|
|                 |         | 1              | 2 | 3 |           |
| UH8100AG-AE3-R  | SOT-23  | O              | I | G | Tape Reel |
| UH8100BG-AE3-R  | SOT-23  | O              | I | G | Tape Reel |

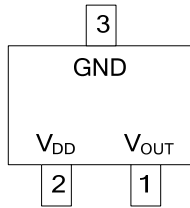
Note: Pin Assignment: O: V<sub>OUT</sub>, I: V<sub>DD</sub>, G: GND

|   |   |
|---|---|
| <p>UH8100XG-AE3-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> <li>(4) Average Supply Current</li> </ul> | <ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AE3: SOT-23</li> <li>(3) G: Halogen Free and Lead Free</li> <li>(4) refer to Electrical Characteristics</li> </ul> |
|---|---|

#### MARKING

|                |                |
|----------------|----------------|
| <p>UH8100A</p> | <p>UH8100B</p> |
|----------------|----------------|

■ PIN CONFIGURATIONS

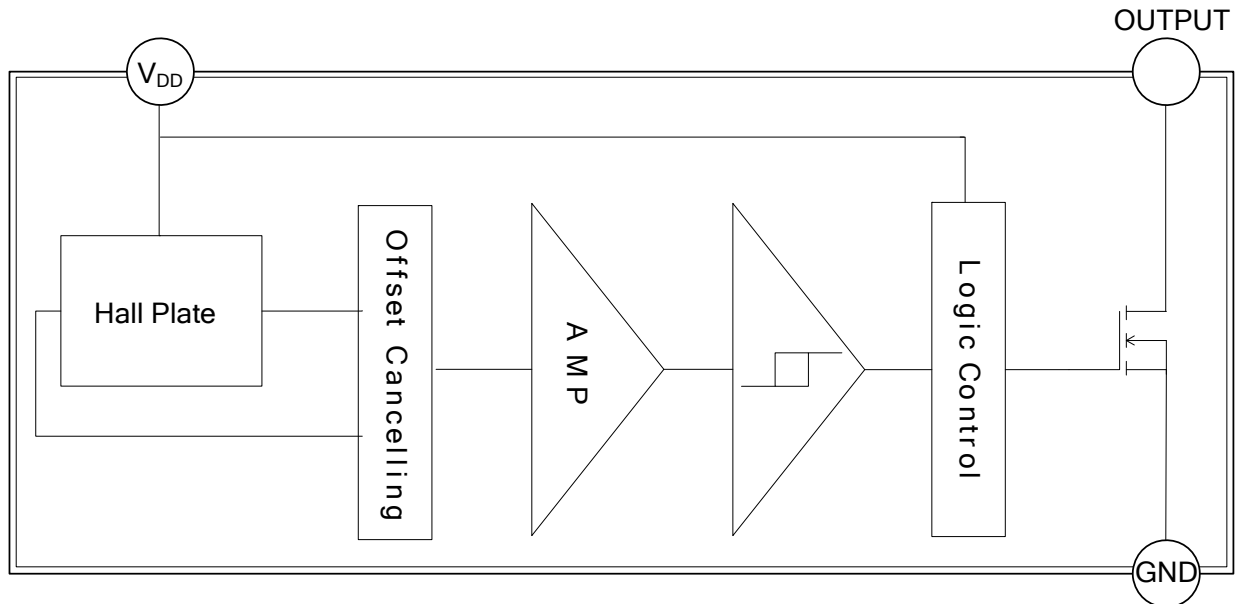


■ PIN DESCRIPTION

| PIN NAME         | PIN TYPE | PIN DESCRIPTION |
|------------------|----------|-----------------|
| V <sub>OUT</sub> | O        | Digital Output  |
| V <sub>DD</sub>  | P        | Power Supply    |
| GND              | G        | Ground          |

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

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ )

| PARAMETER                 | SYMBOL    | RATINGS    | UNIT             |
|---------------------------|-----------|------------|------------------|
| Magnetic Flux Density     | B         | Unlimited  | mT               |
| Supply Voltage            | $V_{DD}$  | 7          | V                |
| Output Current            | $I_O$     | 10         | mA               |
| Package Power Dissipation | $P_D$     | 230        | mW               |
| Junction Temperature      | $T_J$     | 150        | $^\circ\text{C}$ |
| Operation Temperature     | $T_{OPR}$ | -40 ~ +85  | $^\circ\text{C}$ |
| Storage Temperature       | $T_{STG}$ | -65 ~ +150 | $^\circ\text{C}$ |

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 ( $T_A=25^\circ\text{C}$ )

| PARAMETER      | SYMBOL   | CONDITIONS | MIN | TYP | MAX | UNIT |
|----------------|----------|------------|-----|-----|-----|------|
| Supply Voltage | $V_{DD}$ | Operating  | 2.5 |     | 5.5 | V    |

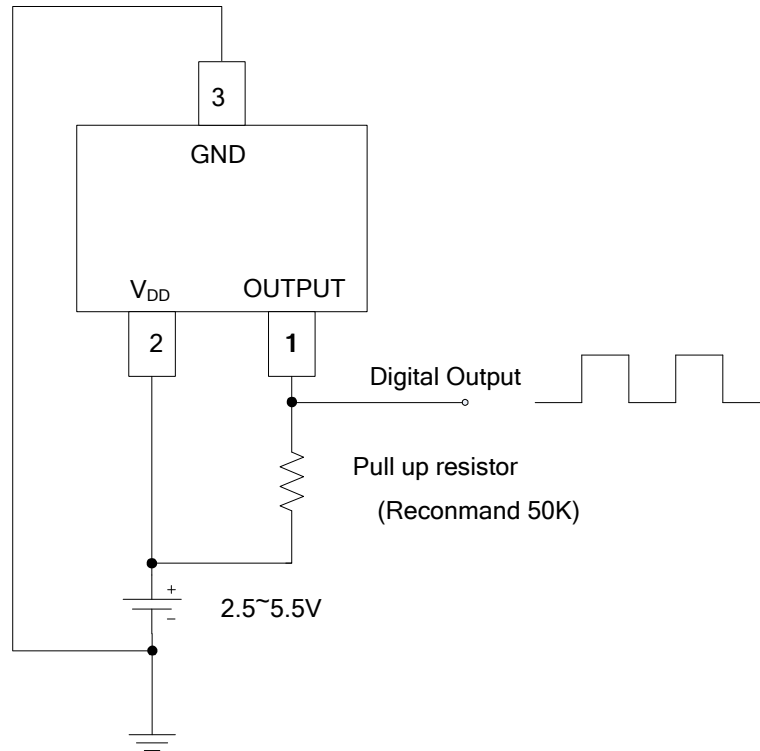
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

| PARAMETER              | SYMBOL        | CONDITIONS  | MIN     | TYP  | MAX | UNIT          |
|------------------------|---------------|---|---------|------|-----|---------------|
| Output On Voltage      | $V_{OUT}$     | $V_{DD}=3\text{V}$ , $I_{OUT}=1\text{mA}$                 |         | 0.1  | 0.3 | V             |
| Output Leakage Current | $I_{OFF}$     | $V_{DD}=3\text{V}$ , $V_{OUT}=5.5\text{V}$ , $B < B_{RP}$ |         | 0.01 | 1   | $\mu\text{A}$ |
| Supply Current         | $I_{DD(AVG)}$ | $V_{DD}=3\text{V}$ ,<br>average supply current            | UH8100A | 5    | 10  | $\mu\text{A}$ |
|                        |               |   | UH8100B | 280  | 500 | $\mu\text{A}$ |
| Awake Time             | $T_{AWAKE}$   | $V_{DD}=3\text{V}$  |         | 50   | 100 | $\mu\text{s}$ |
| Period                 | $T_{PERIOD}$  | $V_{DD}=3\text{V}$ , UH8100A                              |         | 50   | 100 | ms            |
|                        |               | $V_{DD}=3\text{V}$ , UH8100B                              |         | 200  | 400 | $\mu\text{s}$ |
| Duty Cycle             | D.C.          | $V_{DD}=3\text{V}$ , UH8100A                              |         | 0.1  |     | %             |
|                        |               | $V_{DD}=3\text{V}$ , UH8100B                              |         | 25   |     | %             |

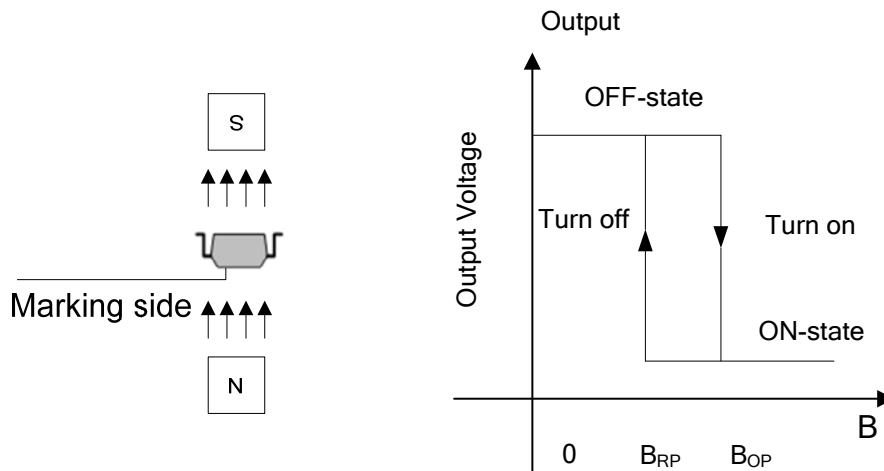
■ MAGNETIC CHARACTERISTICS ( $T_A=25^\circ\text{C}$ ,  $V_{DD}=3\text{V}$ )

| PARAMETER        | SYMBOL            | MIN | TYP | MAX | UNIT  |
|------------------|-------------------|-----|-----|-----|-------|
| Operation Points | $ B_{OP} $        |     | 40  | 60  | Gauss |
| Release Points   | $ B_{RP} $        | 10  | 30  |     |       |
| Hysteresis       | $ B_{OP}-B_{RP} $ |     | 10  |     |       |

## ■ TYPICAL APPLICATION CIRCUIT



## ■ MAGNETIC FLUX



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