



## UH8104

CMOS IC

## HALL EFFECT MICRO SWITCH IC

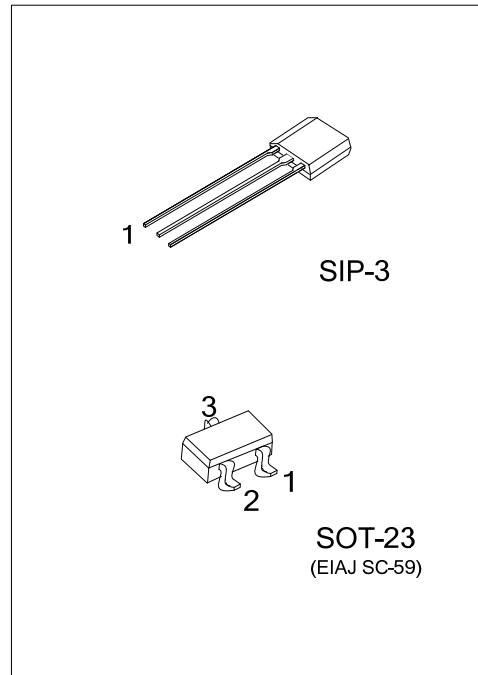
### DESCRIPTION

The **UH8104** is a low power, pole independent Hall-effect switch with a latched digital output driver. It can work in 2.5V supply. Either a north or south pole of sufficient flux will turn the output on. In the absence of a magnetic field, the output is off.

When a magnetic field enters the hall element and exceeds the operate point  $B_{OPS}$  (or less than  $B_{OPN}$ ) the output turns on (output is low). When the magnetic field is below the release point  $B_{RPS}$  (or above  $B_{RPN}$ ), the output turns off (output is high). It is designed with open drain configuration and connecting to a pull up resistor from Output to  $V_{DD}$  is necessary.

### FEATURES

- \* Micro power operation
- \* 2.5V to 5.5V battery operation
- \* Offset Canceling Technology
- \* Independent of North or South Pole Magnet
- \* Superior temperature stability
- \* Extremely Low Switch-Point Drift



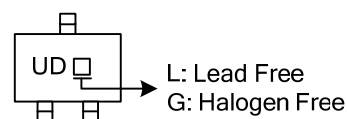
### ORDERING INFORMATION

| Ordering Number |               | Package | Pin Assignment |   |   | Packing   |
|-----------------|---------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen Free  |         | 1              | 2 | 3 |           |
| UH8104L-AE3-R   | UH8104G-AE3-R | SOT-23  | O              | I | G | Tape Reel |
| UH8104L-G03-B   | UH8104G-G03-B | SIP-3   | I              | G | O | Tape Box  |
| UH8104L-G03-K   | UH8104G-G03-K | SIP-3   | I              | G | O | Bulk      |

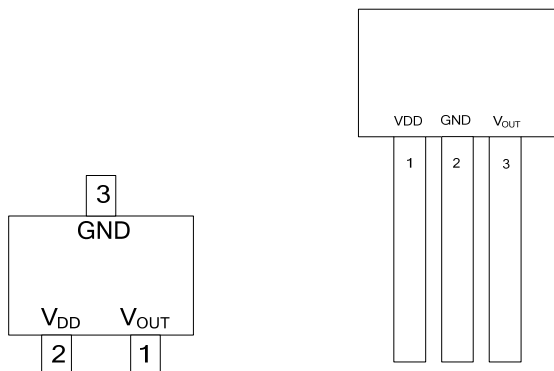
Note: Pin Assignment : O:  $V_{OUT}$ , I:  $V_{DD}$ , G: GND

|                      |                                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------|
| <p>UH8104L-AE3-R</p> | <p>(1) R: Tape Reel, B: Tape Box, K: Bulk<br/>(2) AE3: SOT-23, G03: SIP-3<br/>(3) L: Lead Free, G: Halogen Free</p> |
|----------------------|---------------------------------------------------------------------------------------------------------------------|

### MARKING



## ■ PIN CONFIGURATIONS

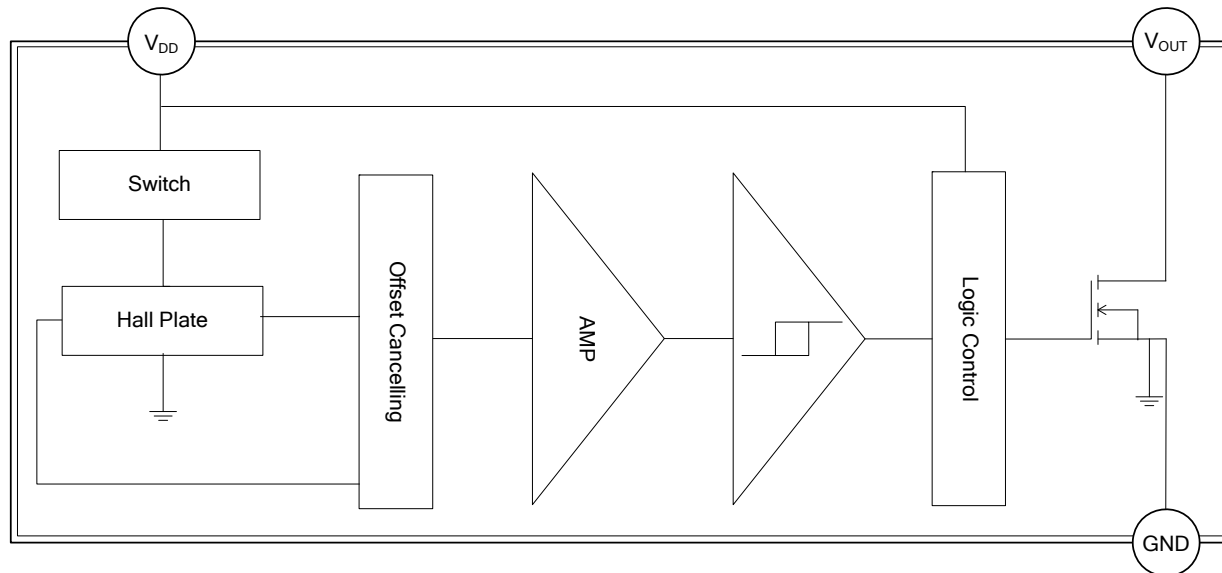


## ■ PIN DESCRIPTION

| PIN NAME  | PIN TYPE | PIN DESCRIPTION |
|-----------|----------|-----------------|
| $V_{OUT}$ | O        | Output Pin      |
| $V_{DD}$  | I        | Power Supply    |
| GND       | G        | Ground          |

Note: O: Output, I: Power Supply, G: Ground

## ■ BLOCK DIAGRAM



■ **ABSOLUTE MAXIMUM RATING** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified.)

| PARAMETER                 | SYMBOL    | RATINGS    | UNIT               |
|---------------------------|-----------|------------|--------------------|
| Magnetic Flux Density     | B         | Unlimited  | mT                 |
| Supply Voltage            | $V_{DD}$  | 7          | V                  |
| 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    |

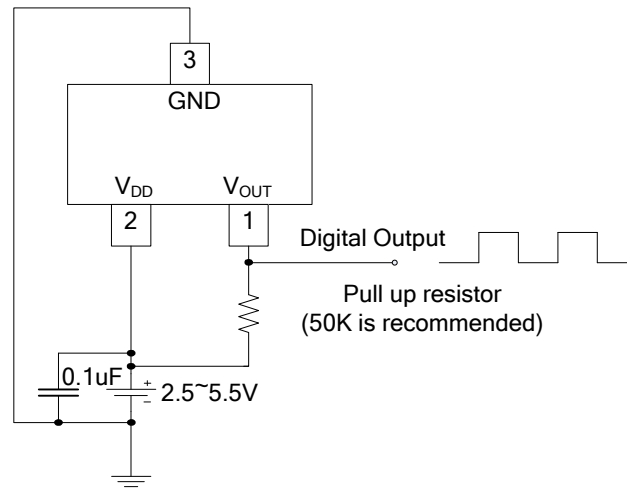
■ **ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ ,  $V_{DD}=3\text{V}$ )

| PARAMETER              | SYMBOL       | CONDITIONS                                        | MIN | TYP | MAX | UNIT          |
|------------------------|--------------|---------------------------------------------------|-----|-----|-----|---------------|
| Output Low Voltage     | $V_{OL}$     | $I_{SINK} = 1\text{mA}$                           |     | 20  | 40  | mV            |
| Output Leakage Current | $I_{OFF}$    | $V_{OUT} = 5.5\text{V}$ , $B_{RPN} < B < B_{RPS}$ |     |     | 1   | $\mu\text{A}$ |
| Supply Current         | $I_{DD}$     | Average                                           |     | 5   | 10  | $\mu\text{A}$ |
|                        |              | Awake                                             |     | 1.2 | 2   | mA            |
|                        |              | Sleep                                             |     | 2   | 8   | $\mu\text{A}$ |
| Awake Time             | $T_{AWAKE}$  |                                                   |     | 75  | 125 | $\mu\text{s}$ |
| Period                 | $T_{PERIOD}$ |                                                   |     | 75  | 125 | mS            |
| Duty Cycle             | D.C.         |                                                   |     | 0.1 |     | %             |

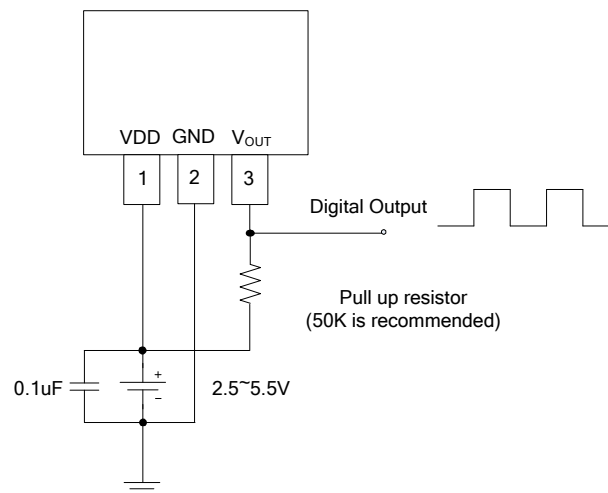
■ **MAGNETIC CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ ,  $V_{DD}=3\text{V}$ ,  $1\text{mT}=10\text{Gauss}$ )

| PARAMETER        | SYMBOL              | MIN | TYP | MAX | UNIT  |
|------------------|---------------------|-----|-----|-----|-------|
| Operation Points | $B_{OPS}$           |     | 40  | 60  | Gauss |
|                  | $B_{OPN}$           | -60 | -40 |     |       |
| Release Points   | $B_{RPS}$           | 10  | 30  |     |       |
|                  | $B_{RPN}$           |     | -30 | -10 |       |
| Hysteresis       | $ B_{OPX}-B_{RPX} $ |     | 10  |     |       |

## ■ TYPICAL APPLICATION CIRCUIT

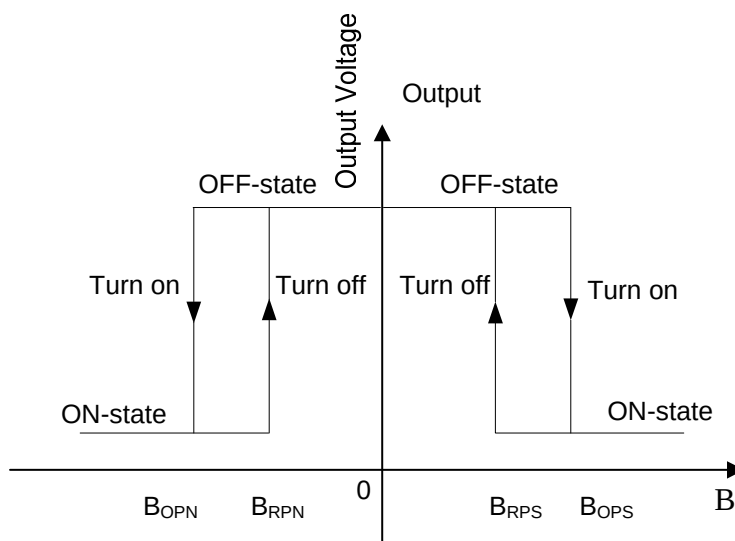


SOT-23



SIP-3

# ■ MAGNETIC FLUX



SOT-23 / SIP-3

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