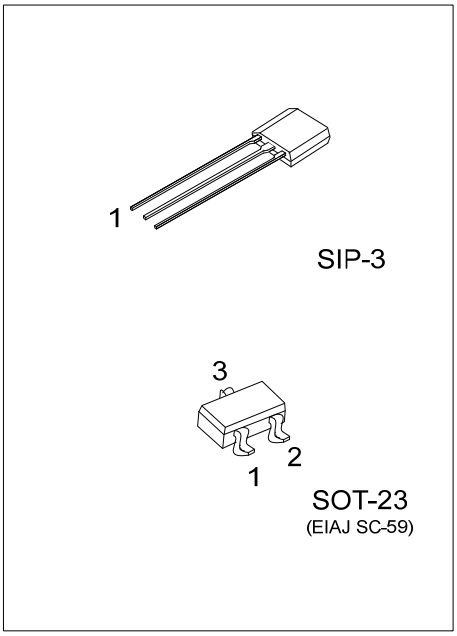
# UHC182

**CMOS IC**

## SINGLE OUTPUT HALL EFFECT LATCH




## ■ DESCRIPTION

UTC **UHC182** is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device using HVCMOS process includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold Bop, OUT is turned on (low). The output state is held until a magnetic flux density reversal falls below Brp causing OUT to be turned off (high).

## ■ FEATURES

* 2.8V~30V DC operation voltage
* Temperature compensation
* Wide operating voltage range
* Open-Drain pre-driver
* 25mA maximum sinking output current.

## ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UHC182L-AE3-R | UHC182G-AE3-R | SOT-23 | I | O | G | Tape Reel |
| UHC182L-G03-B | UHC182G-G03-B | SIP-3 | I | G | O | Tape Box |
| UHC182L-G03-K | UHC182G-G03-K | SIP-3 | I | G | O | Bulk |

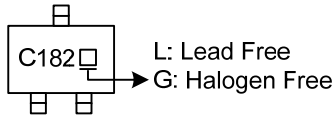
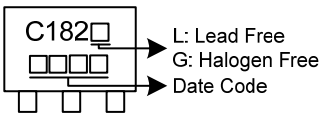
Note: Pin Assignment: I: $V_{DD}$ G: GND O: Output

UHC182G-AE3-R

(1) Packing Type
(2) Package Type
(3) Green Package

(1) R: Tape Reel, B: Tape Box, K: Bulk
(2) AE3: SOT-23, G03: SIP-3
(3) G: Halogen Free and Lead Free, L: Lead Free

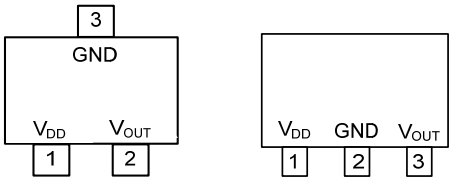
## ■ MARKING

| SOT-23 | SIP-3 |
|---|---|
|  |  |





## ■ PIN CONFIGURATION

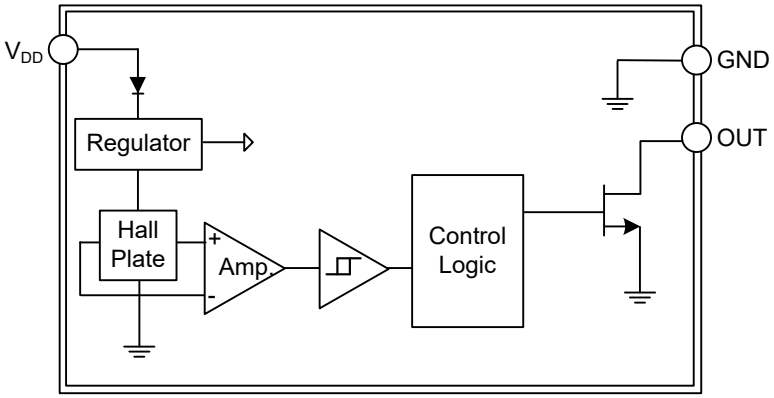




## ■ PIN DESCRIPTION

| PIN NAME | DESCRIPTION |
|---|---|
| $V_{DD}$ | Supply voltage |
| GND | Ground |
| Output | Output voltage |

## ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Supply Voltage | | $V_{CC}$ | 32 | V |
| Reverse $V_{CC}$ Polarity Voltage | | $V_{RCC}$ | -32 | V |
| Magnetic Flux Density | | B | Unlimited | Gauss |
| Output Current | Continuous | $I_O$ | 25 | mA |
| Power Dissipation | SOT-23 | $P_D$ | 200 | mW |
| | SIP-3 | | 400 | mW |
| Ambient Temperature | | $T_A$ | -40 ~ +125 | °C |
| Storage Temperature Range | | $T_{STG}$ | -65 ~ +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.

## ■ ELECTRICAL CHARACTERISTICS ($V_{DD}$=12V , $T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_{DD}$ | Operating | 2.8 | | 30 | V |
| Supply Current | $I_{DD}$ | Operating | | 3.0 | 4.5 | mA |
| Output Leakage Current | $I_{OFF}$ | $V_{OUT}$ = 12V | | < 0.1 | 10 | uA |
| Output Saturation Voltage | $V_{DS(SAT)}$ | $I_{OUT}$=20mA | | 0.3 | | V |

## ■ MAGNETIC CHARACTERISTICS ($V_{DD}$=12V, $T_A$=25°C, unless otherwise specified)

**For UHC182-A**

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Operate Point, BOP | $B_{OP}$ | B>$B_{OP}$, $V_{OUT}$ On | 5 | 20 | 40 | Gauss |
| Release Point, BRP | $B_{RP}$ | B<$B_{RP}$, $V_{OUT}$ Off | -40 | -20 | -5 | Gauss |
| Hysteresis | $B_{HY}$ | \|BOP - BRP\| | | 40 | | Gauss |

**For UHC182-B**

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Operate Point, BOP | $B_{OP}$ | B>$B_{OP}$, $V_{OUT}$ On | 5 | 35 | 60 | Gauss |
| Release Point, BRP | $B_{RP}$ | B<$B_{RP}$, $V_{OUT}$ Off | -60 | -35 | -5 | Gauss |
| Hysteresis | $B_{HY}$ | \|BOP - BRP\| | | 70 | | Gauss |

Note: 1mT=10 Gauss.

## ■ DRIVER OUTPUT VS. MAGNETIC POLE

**For SIP3**

| PARAMETER | TEST CONDITIONS | DO |
|---|---|---|
| North Pole | B < Brp | High |
| South Pole | B > Bop | Low |

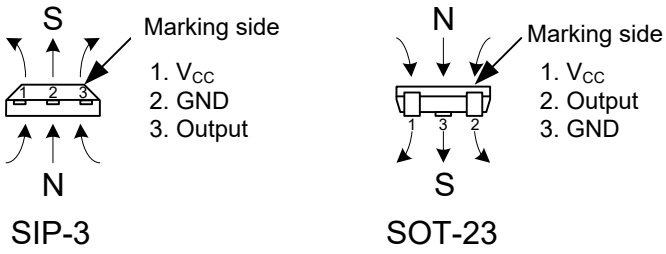
Note: The magnetic pole is applied facing the branded side of the SIP-3 package.

**For SOT-23**

| PARAMETER | TEST CONDITIONS | DO |
|---|---|---|
| North Pole | B > Bop | Low |
| South Pole | B < Brp | High |

Note: The magnetic pole is applied facing the branded side of the SOT-23 package.

## ■ CHYSTERESIS CHARACTERISTICS



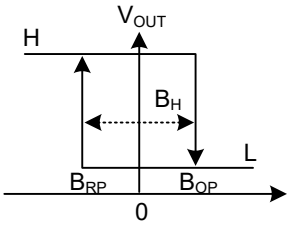
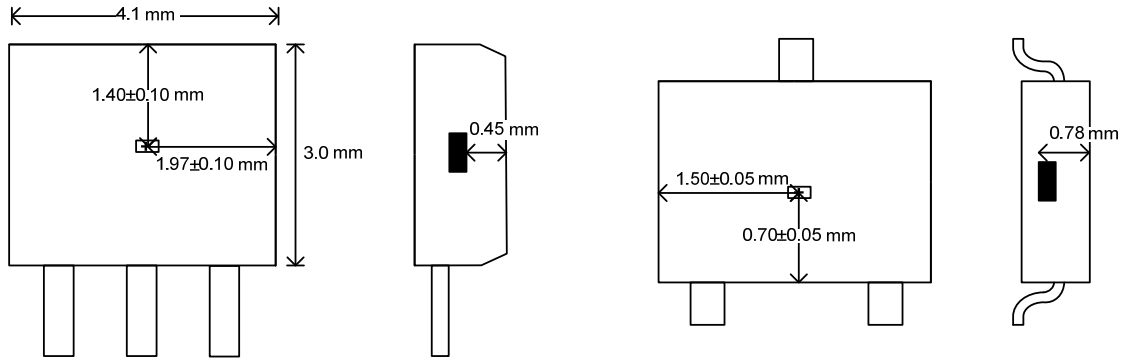




Figure 1. Applying Direction of Magnetic Flux

## ■ TEST CIRCUIT




## ■ TYPICAL APPLICATION CIRCUIT