



## UHC182

Preliminary

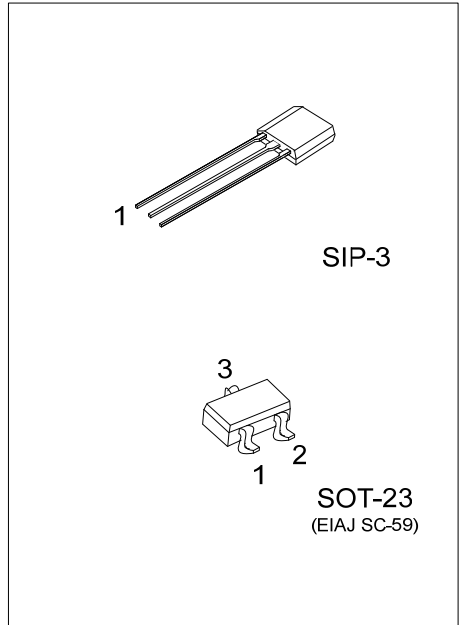
CMOS IC

### 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  $B_{op}$ , OUT is turned on (low). The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  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.

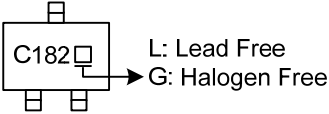
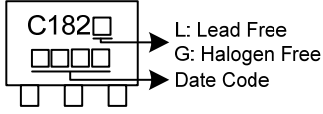
#### ORDERING INFORMATION

| 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      |

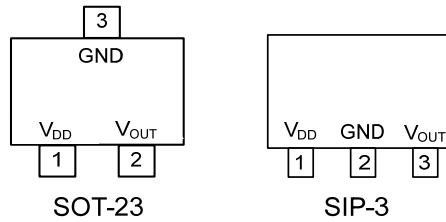
Note: Pin Assignment: I:  $V_{DD}$  G: GND O: Output

|                                                                                         |                                                                                                                                   |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>UHC182G-AE3-R</p> <p>(1) Packing Type<br/>(2) Package Type<br/>(3) Green Package</p> | <p>(1) R: Tape Reel, B: Tape Box, K: Bulk<br/>(2) AE3: SOT-23, G03: SIP-3<br/>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

### MARKING

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

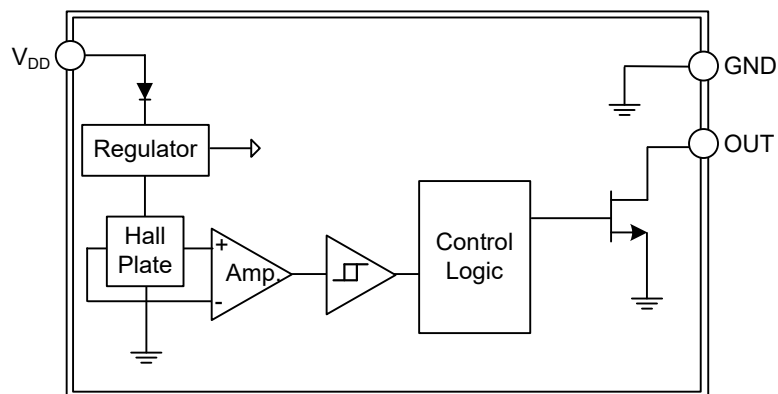
### PIN CONFIGURATION



### PIN DESCRIPTION

| PIN NAME        | DESCRIPTION    |
|-----------------|----------------|
| V <sub>DD</sub> | Supply voltage |
| GND             | Ground         |
| Output          | Output voltage |

### BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

| PARAMETER                                |            | SYMBOL           | RATINGS    | UNIT  |
|------------------------------------------|------------|------------------|------------|-------|
| Supply Voltage                           |            | V <sub>CC</sub>  | 32         | V     |
| Reverse V <sub>CC</sub> Polarity Voltage |            | V <sub>RCC</sub> | -32        | V     |
| Magnetic Flux Density                    |            | B                | Unlimited  | Gauss |
| Output Current                           | Continuous | I <sub>O</sub>   | 25         | mA    |
| Power Dissipation                        | SOT-23     | P <sub>D</sub>   | 200        | mW    |
|                                          | SIP-3      |                  | 400        | mW    |
| Ambient Temperature                      |            | T <sub>A</sub>   | -40 ~ +125 | °C    |
| Storage Temperature Range                |            | T <sub>STG</sub> | -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<sub>DD</sub>=12V, T<sub>A</sub>=25°C, unless otherwise specified)

| PARAMETER                 | SYMBOL               | TEST CONDITIONS        | MIN | TYP   | MAX | UNIT |
|---------------------------|----------------------|------------------------|-----|-------|-----|------|
| Supply Voltage            | V <sub>DD</sub>      | Operating              | 2.8 |       | 30  | V    |
| Supply Current            | I <sub>DD</sub>      | Operating              |     | 3.0   | 4.5 | mA   |
| Output Leakage Current    | I <sub>OFF</sub>     | V <sub>OUT</sub> = 12V |     | < 0.1 | 10  | µA   |
| Output Saturation Voltage | V <sub>DS(SAT)</sub> | I <sub>OUT</sub> =20mA |     | 0.3   |     | V    |

■ MAGNETIC CHARACTERISTICS (V<sub>DD</sub>=12V, T<sub>A</sub>=25°C, unless otherwise specified)

**For UHC182-A**

| PARAMETER          | SYMBOL          | TEST CONDITIONS                            | MIN | TYP | MAX | UNIT  |
|--------------------|-----------------|--------------------------------------------|-----|-----|-----|-------|
| Operate Point, BOP | B <sub>OP</sub> | B > B <sub>OP</sub> , V <sub>OUT</sub> On  | 5   | 20  | 40  | Gauss |
| Release Point, BRP | B <sub>RP</sub> | B < B <sub>RP</sub> , V <sub>OUT</sub> Off | -40 | -20 | -5  | Gauss |
| Hysteresis         | B <sub>HY</sub> | B <sub>OP</sub> - B <sub>RP</sub>          |     | 40  |     | Gauss |

**For UHC182-B**

| PARAMETER          | SYMBOL          | TEST CONDITIONS                            | MIN | TYP | MAX | UNIT  |
|--------------------|-----------------|--------------------------------------------|-----|-----|-----|-------|
| Operate Point, BOP | B <sub>OP</sub> | B > B <sub>OP</sub> , V <sub>OUT</sub> On  | 5   | 35  | 60  | Gauss |
| Release Point, BRP | B <sub>RP</sub> | B < B <sub>RP</sub> , V <sub>OUT</sub> Off | -60 | -35 | -5  | Gauss |
| Hysteresis         | B <sub>HY</sub> | B <sub>OP</sub> - B <sub>RP</sub>          |     | 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  |

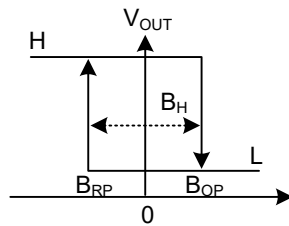
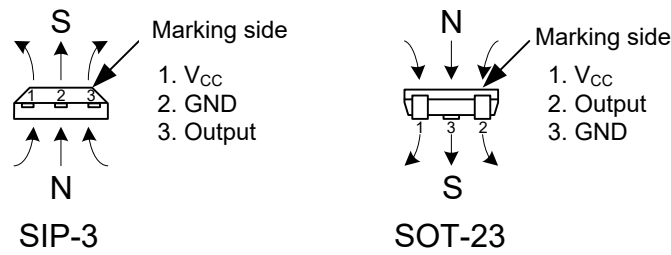
Note: The magnetic pole is applied facing the branded side of the SIP-3 package.

**For SOT-23**

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

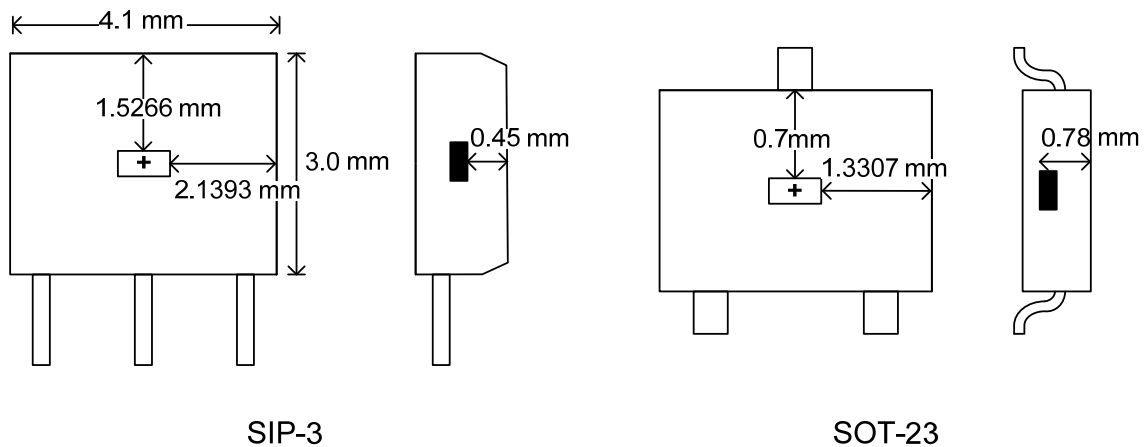
Note: The magnetic pole is applied facing the branded side of the SOT-23 package.

■ CHYSTERESIS CHARACTERISTICS

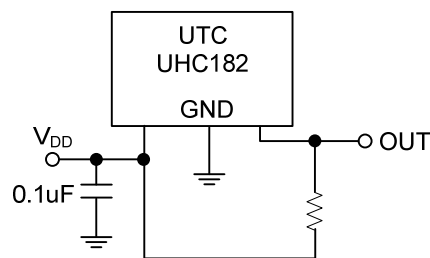


Magnetic Flux Density  
Figure 1. Applying Direction of Magnetic Flux

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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