



## UH378

## LINEAR INTEGRATED CIRCUIT

### COMPLEMENTARY OUTPUTS HALL EFFECT LATCH IC

#### DESCRIPTION

The UTC **UH378** is a Latch-Type Hall Effect sensor with built-in complementary output drivers. It's composed of internal temperature compensation circuit and built-in protection diode to prevent reverse power fault. It is aimed for brush-less DC Fan.

The outputs of the **UH378** operate as the Hysteresis Characteristics. The Outputs alternately switch between ON and OFF when either the magnetic flux density is larger than threshold  $B_{OP}$  or the magnetic flux density is lower than  $B_{RP}$ .

#### FEATURES

- \* Widen Power Supply range from 3V ~ 20V.
- \* On-chip Hall sensor with excellent hysteresis.
- \* Build-in reverse protection diode.
- \* TTL and MOS IC are directly drivable by the output
- \* The life is semi permanent because it employs contact-less parts

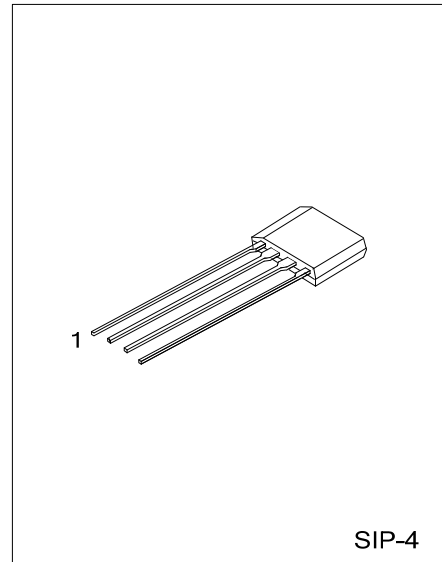
#### ORDERING INFORMATION

| Ordering Number |              | Package | Packing |
|-----------------|--------------|---------|---------|
| Lead Free       | Halogen Free |         |         |
| UH378L-G04-K    | UH378G-G04-K | SIP-4   | Bulk    |

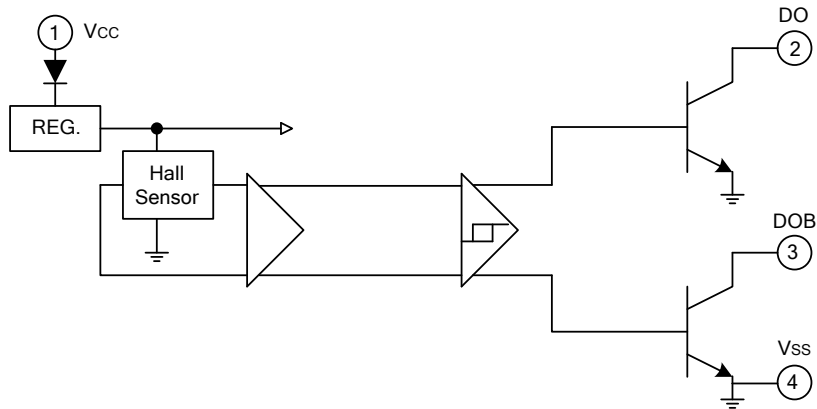
|   |   |
|---|---|
| <p>UH378L-G04-K</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p> | <p>(1) K: Bulk</p> <p>(2) G04: SIP-4</p> <p>(3) G: Halogen Free, L: Lead Free</p> |
|---|---|

#### PIN DESCRIPTION

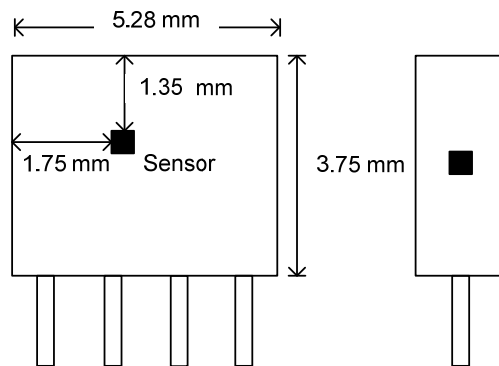
| PIN NO. | PIN NAME | P/I/O | DESCRIPTION           |
|---------|----------|-------|-----------------------|
| 1       | $V_{CC}$ | P     | Positive Power Supply |
| 2       | DO       | O     | Output Pin            |
| 3       | DOB      | O     | Output Pin            |
| 4       | $V_{SS}$ | P     | Ground                |



## ■ BLOCK DIAGRAM



## ■ SENSOR LOCATIONS



■ ABSOLUTE MAXIMUM RATING (Ta=25°C)

| PARAMETER                                | SYMBOL           | RATINGS    | UNIT |
|--|------------------|------------|------|
| Supply Voltage                           | V <sub>CC</sub>  | 20         | V    |
| Reverse V <sub>CC</sub> Polarity Voltage | V <sub>RCC</sub> | -25        | V    |
| Circuit Current                          | I <sub>O</sub>   | 20         | mA   |
| Magnetic flux density                    | B                | Unlimited  |      |
| Power Dissipation                        | P <sub>D</sub>   | 500        | mW   |
| Junction Temperature                     | T <sub>J</sub>   | +150       | °C   |
| Operating Temperature                    | T <sub>OPR</sub> | -20 ~ +85  | °C   |
| Storage Temperature                      | 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 (Ta =25°C, unless otherwise specified)

| PARAMETER                | SYMBOL           | TEST CONDITIONS  | MIN | TYP | MAX | UNIT |
|--------------------------|------------------|--|-----|-----|-----|------|
| Low-Level Output Voltage | V <sub>OL</sub>  | V <sub>CC</sub> = 14V, I <sub>OUT</sub> =5mA                     | -   | 0.5 | 0.7 | V    |
|                          |                  | V <sub>CC</sub> = 3.6V, I <sub>OUT</sub> =5mA                    |     | 0.4 | 0.7 |      |
| Output Leakage Current   | I <sub>CEX</sub> | V <sub>CC</sub> =14V   | -   | 1   | 10  | uA   |
| Supply Current           | I <sub>CC</sub>  | V <sub>CC</sub> =14V   | -   | 4.7 | 5   | mA   |
|                          |                  | V <sub>CC</sub> =3.6V  |     | 4.6 | 5   |      |
| Output Switching Time    | t <sub>R</sub>   | V <sub>CC</sub> =14V, R <sub>L</sub> =10KΩ, C <sub>L</sub> =10pF | -   | -   | 5   | us   |
|                          | t <sub>F</sub>   | V <sub>CC</sub> =14V, R <sub>L</sub> =10KΩ, C <sub>L</sub> =10pF |     |     | 2   |      |

■ MAGNETIC CHARACTERISTICS

A grade

| PARAMETR      | SYMBOL           | MIN | TYP | MAX | UNIT |
|---------------|------------------|-----|-----|-----|------|
| Operate Point | B <sub>OP</sub>  | 5   |     | 50  | G    |
| Release Point | B <sub>RP</sub>  | -50 |     | -5  | G    |
| Hysteresis    | B <sub>HYS</sub> | 20  |     | 100 | G    |

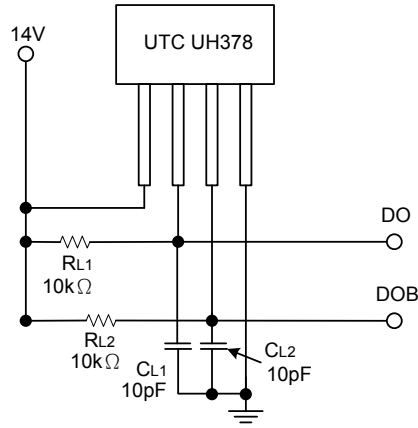
B grade

| PARAMETR      | SYMBOL           | MIN | TYP | MAX | UNIT |
|---------------|------------------|-----|-----|-----|------|
| Operate Point | B <sub>OP</sub>  | 5   |     | 70  | G    |
| Release Point | B <sub>RP</sub>  | -70 |     | -5  | G    |
| Hysteresis    | B <sub>HYS</sub> | 20  |     | 140 | G    |

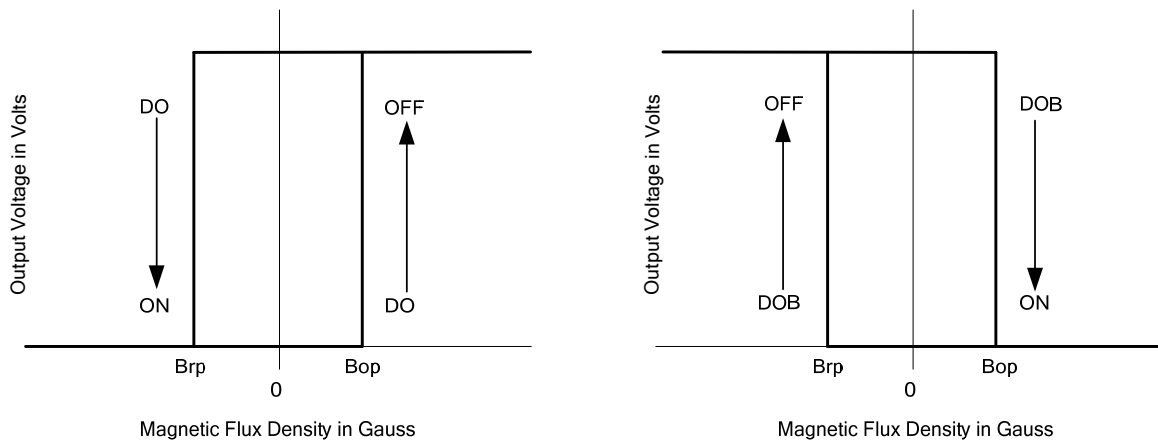
C grade

| PARAMETR      | SYMBOL           | MIN  | TYP | MAX | UNIT |
|---------------|------------------|------|-----|-----|------|
| Operate Point | B <sub>OP</sub>  |      |     | 100 | G    |
| Release Point | B <sub>RP</sub>  | -100 |     |     | G    |
| Hysteresis    | B <sub>HYS</sub> | 20   |     | 200 | G    |

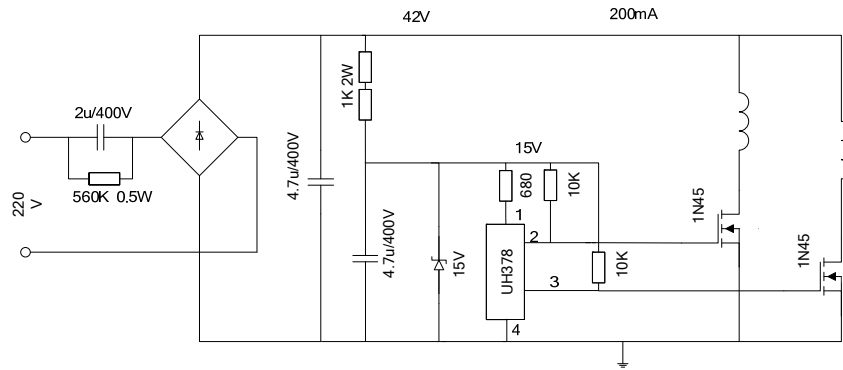
## ■ TEST CIRCUIT



## ■ HYSTERESIS CHARACTERISTICS



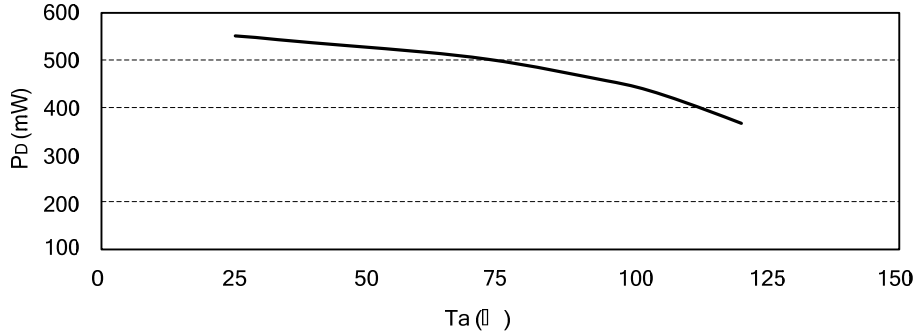
■ TYPICAL APPLICATION CIRCUIT



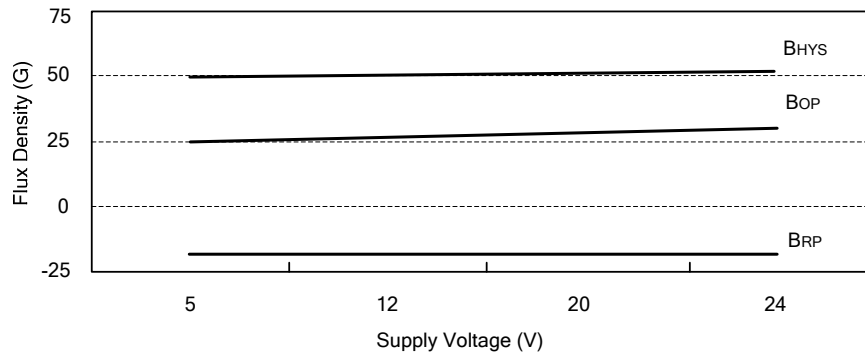
## ■ PERFORMANCE CHARACTERISTICS

|                     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ta(°C)              | 25  | 50  | 60  | 70  | 80  | 85  | 90  | 95  | 100 | 105 | 110 | 115 | 120 |
| P <sub>D</sub> (mW) | 550 | 525 | 515 | 505 | 485 | 475 | 465 | 455 | 445 | 425 | 405 | 385 | 365 |

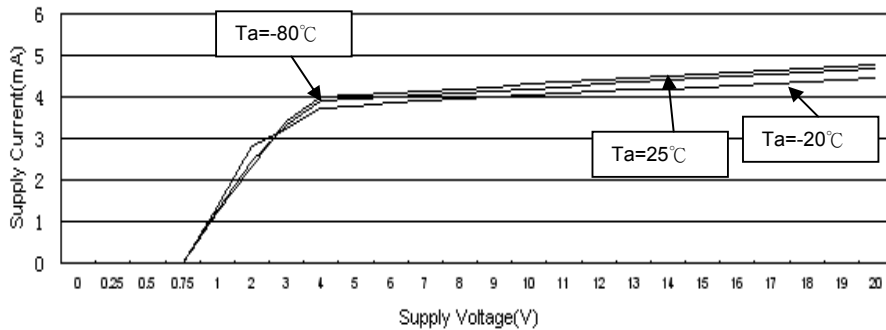
Power Dissipation Curve



Typical Magnetic Switch Point vs. Supply Voltage



Typical Supply Current vs. Supply Voltage



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