

# Hallogic Hall-Effect Sensors

OH090U, OH180U, OH360U

OHN3000 series, OHS3000 series

OHN3100 series, OHS3100 series



## Features:

- Designed for non-contact switching operations
- Operates over broad range of supply voltages (4.5 V to 24 V)
- Operates with excellent temperature stability in harsh environments
- Drive capability up to 7 TTL loads

## Description:

These Hall-effect devices contain a monolithic integrated circuit which incorporates a Hall element, a linear amplifier, a threshold amplifier, and Schmitt trigger on a single Hallogic® silicon chip. Included on-chip is a band gap voltage regulator to allow operation with a wide range of supply voltages. These devices feature logic level output and provide up to 21 mA of sink current. This allows direct driving of more than 7 TTL loads or any standard logic family using power supplies ranging from 4.5 to 24 volts. Output amplitude is constant at switching frequencies from DC to over 200 kHz.

The Uni-Polar turns on with a (logic level "0") after a sufficient magnetic field from the south pole of a magnet approached the symbolized face of the device (Operating Point) and turns off (logic level "1") after the magnetic field reached a minimum value. The Bi-Polar latch device turns on (logic level "0") in the presence of a magnetic south pole and turn off (logic level "1") when subjected to a magnetic north pole. Both magnetic poles are necessary for operation for Bi-Polar devices. This feature makes these sensors ideal for applications in non-contact switching operations, brushless DC motors and for use with multiple pole magnets.

## Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

| Ordering Information                                                                                                                                                                                           |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Through Hole                                                                                                                                                                                                   | Configuration            |
| OH090U<br>OH180U<br>OH360U<br>OHN3113U<br>OHN3019U<br>OHS3019U<br>OHN3020U<br>OHS3020U<br>OHN3120U<br>OHS3120U<br>OHN3030U<br>OHS3030U<br>OHS3130U<br>OHS3131U<br>OHN3040U<br>OHS3040U<br>OHN3140U<br>OHS3140U | Unipolar<br>non-latching |

| Ordering Information                                     |                      |
|----------------------------------------------------------|----------------------|
| Through Hole                                             | Configuration        |
| OHN3075U<br>OHS3075U<br>OHN3175U<br>OHS3175U<br>OHS3177U | Bi-Polar<br>latching |



RoHS

## General Note

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## Electrical Specifications

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

|                                                                                        |                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply Voltage, $V_{CC}$                                                               | 25 V                                                                                                                                                                                                                                                                                                    |
| Storage Temperature Range, $T_S$                                                       | $-65^\circ\text{C}$ to $+160^\circ\text{C}$                                                                                                                                                                                                                                                             |
| Operating Temperature Range, $T_A$                                                     | <div>OHN30__U</div> <div>OHS30__U</div> <div>OH090/180/360U</div> <div><math>-20^\circ\text{C}</math> to <math>+85^\circ\text{C}</math></div> <div><math>-40^\circ\text{C}</math> to <math>+125^\circ\text{C}</math></div> <div><math>-40^\circ\text{C}</math> to <math>+150^\circ\text{C}</math></div> |
| Lead Soldering Temperature (1/8 in. (3.2 mm) from case for 5 sec. with soldering iron) | $260^\circ\text{C}^{(1)}$                                                                                                                                                                                                                                                                               |
| Output ON Current, $I_{SINK}$                                                          | 25 mA                                                                                                                                                                                                                                                                                                   |
| Output OFF Voltage, $V_{OUT}$                                                          | 25 V                                                                                                                                                                                                                                                                                                    |
| Magnetic Flux Density, B                                                               | Unlimited                                                                                                                                                                                                                                                                                               |

### Electrical Characteristics ( $V_{CC} = 4.5\text{ V}$ to $24\text{ V}$ , $T_A = 25^\circ\text{C}$ unless otherwise noted)

#### OH090U Uni-Polar

| SYMBOL   | PARAMETER                             | MIN  | TYP  | MAX  | UNITS         | TEST CONDITIONS                                                               |
|----------|---------------------------------------|------|------|------|---------------|-------------------------------------------------------------------------------|
| $B_{OP}$ | Magnetic Operate Point <sup>(1)</sup> | 0    | 90   | 180  | Gauss         |                                                                               |
| $B_{RP}$ | Magnetic Release Point                | -100 | 65   | 100  | Gauss         |                                                                               |
| $B_H$    | Magnetic Hysteresis                   | 10   | 25   | 100  | Gauss         |                                                                               |
| $I_{CC}$ | Supply Current                        | -    | 6    | 9    | mA            | $V_{CC} = 24\text{ V}$ , Output Off                                           |
| $V_{OL}$ | Output Saturation Voltage             | -    | 100  | 300  | mV            | $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 20\text{ mA}$ , $B \geq 180\text{ Gauss}$ |
| $I_{OH}$ | Output Leakage Current                | -    | 0.5  | 10.0 | $\mu\text{A}$ | $V_{CC} = 24\text{ V}$ , $V_{OUT} = 24\text{ V}$ , $B \leq -100\text{ Gauss}$ |
| $t_r$    | Output Rise Time                      | -    | 0.21 | 1.00 | $\mu\text{s}$ | $R_L = 820\ \Omega$ , $C_L = 20\text{ pF}$ , $V_{CC} = 14\text{ V}$           |
| $t_f$    | Output Fall Time                      | -    | 0.10 | 1.00 | $\mu\text{s}$ |                                                                               |

#### OH180U Uni-Polar

| SYMBOL   | PARAMETER                             | MIN | TYP  | MAX  | UNITS         | TEST CONDITIONS                                                               |
|----------|---------------------------------------|-----|------|------|---------------|-------------------------------------------------------------------------------|
| $B_{OP}$ | Magnetic Operate Point <sup>(1)</sup> | 70  | 180  | 290  | Gauss         |                                                                               |
| $B_{RP}$ | Magnetic Release Point                | 0   | 140  | 230  | Gauss         |                                                                               |
| $B_H$    | Magnetic Hysteresis                   | 20  | 40   | 120  | Gauss         |                                                                               |
| $I_{CC}$ | Supply Current                        | -   | 6    | 9    | mA            | $V_{CC} = 24\text{ V}$ , Output Off                                           |
| $V_{OL}$ | Output Saturation Voltage             | -   | 100  | 300  | mV            | $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 20\text{ mA}$ , $B \geq 290\text{ Gauss}$ |
| $I_{OH}$ | Output Leakage Current                | -   | 0.5  | 10.0 | $\mu\text{A}$ | $V_{CC} = 24\text{ V}$ , $V_{OUT} = 24\text{ V}$ , $B \leq 0\text{ Gauss}$    |
| $t_r$    | Output Rise Time                      | -   | 0.21 | 1.00 | $\mu\text{s}$ | $R_L = 820\ \Omega$ , $C_L = 20\text{ pF}$ , $V_{CC} = 14\text{ V}$           |
| $t_f$    | Output Fall Time                      | -   | 0.10 | 1.00 | $\mu\text{s}$ |                                                                               |

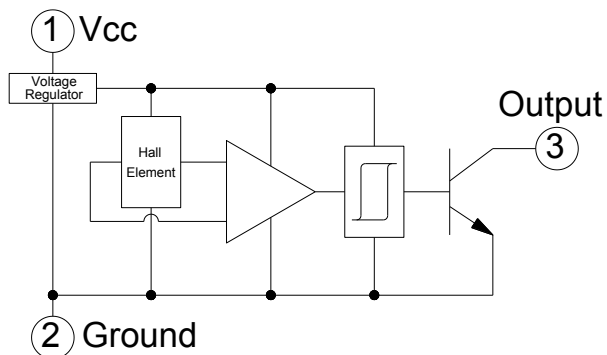
#### Notes:

(1) South pole facing symbolized surface.

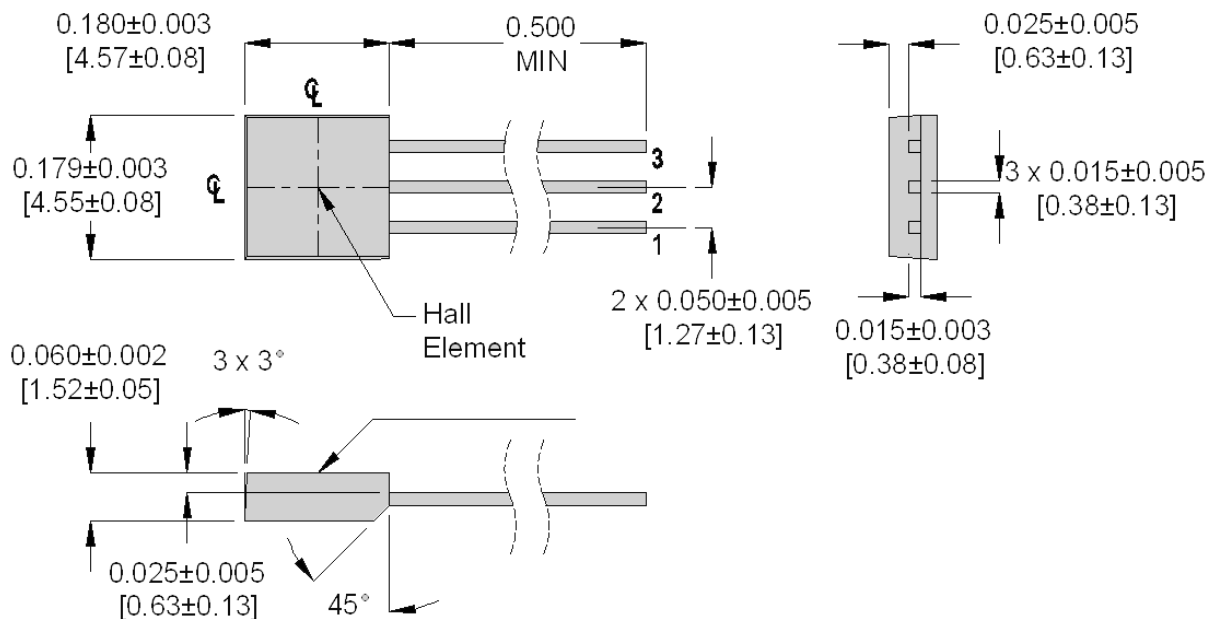
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| Pin # | Transistor      |
|-------|-----------------|
| 1     | V <sub>CC</sub> |
| 2     | Ground          |
| 3     | Output          |



NOTE: The Hall Element is located 0.013" beneath the top surface of the package.  
The back of the package is denoted by the 45° angle at the base of the plastic body.

DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

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## Electrical Characteristics (V<sub>CC</sub> = 4.5 V to 24 V, T<sub>A</sub> = 25° C unless otherwise noted)

### OH360U Uni-Polar

| SYMBOL          | PARAMETER                             | MIN | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|-----|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | 235 | 300  | 465  | Gauss |                                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | 120 | 235  | 325  | Gauss |                                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | 30  | 65   | 200  | Gauss |                                                                        |
| I <sub>CC</sub> | Supply Current                        | -   | 6    | 9    | mA    | V <sub>CC</sub> = 24 V, Output Off                                     |
| V <sub>OL</sub> | Output Saturation Voltage             | -   | 100  | 300  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 465 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                | -   | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 120 Gauss         |
| t <sub>r</sub>  | Output Rise Time                      | -   | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 14 V |
| t <sub>f</sub>  | Output Fall Time                      | -   | 0.10 | 1.00 | μs    |                                                                        |

### OHN3013U, OHN3113U Uni-Polar

| SYMBOL          | PARAMETER                             | MIN                 | TYP      | MAX        | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------------------|----------|------------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OHN3013<br>-        | 300<br>- | 450<br>510 | Gauss | +25°C<br>-20°C TO 85°C                                                 |
| B <sub>RP</sub> | Magnetic Release Point                | OHN3013<br>30<br>20 | 235<br>- | -<br>-     | Gauss | +25°C<br>-20°C TO 85°C                                                 |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OHN3013<br>20<br>10 | 65<br>-  | -<br>-     | Gauss | +25°C<br>-20°C TO 85°C                                                 |
| I <sub>CC</sub> | Supply Current                        | -                   | 4        | 7          | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ 25 Gauss                       |
| V <sub>OL</sub> | Output Saturation Voltage             | -                   | 100      | 400        | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 450 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                | -                   | 0.1      | 10.0       | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 25 Gauss          |
| t <sub>r</sub>  | Output Rise Time                      | -                   | 0.21     | 1.00       | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      | -                   | 0.10     | 1.00       | μs    |                                                                        |

#### Notes:

(1) South pole facing symbolized surface.

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## Electrical Characteristics (V<sub>CC</sub> = 4.5 V to 24 V, T<sub>A</sub> = 25° C unless otherwise noted)

### OHN3019U, OHS3019U, OHN3119U, OHS3119U Uni-Polar

| SYMBOL          | PARAMETER                             |         | MIN | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------|-----|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OH_3019 | 175 | 300  | 500  | Gauss | +25°C                                                                  |
|                 |                                       | OHN3119 | 100 | -    | 545  |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3119 | 45  | -    | 575  |       | -40°C to +125°C                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | OH_3019 | 125 | 235  | 450  | Gauss | +25°C                                                                  |
|                 |                                       | OHN3119 | 50  | -    | 495  |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3119 | 25  | -    | 555  |       | -40°C to +125°C                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OH_3019 | 50  | 65   | -    | Gauss | +25°C                                                                  |
|                 |                                       | OHN3119 | 50  | -    | -    |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3119 | 20  | -    | -    |       | -40°C to +125°C                                                        |
| I <sub>CC</sub> | Supply Current                        |         | -   | 4    | 7    | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ 125 Gauss                      |
| V <sub>OL</sub> | Output Saturation Voltage             |         | -   | 100  | 400  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 500 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                |         | -   | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 100 Gauss         |
| t <sub>r</sub>  | Output Rise Time                      |         | -   | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      |         | -   | 0.10 | 1.00 | μs    |                                                                        |

### OHN3020U, OHS3020U, OHN3120U, OHS3120U Uni-Polar

| SYMBOL          | PARAMETER                             |         | MIN | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------|-----|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OH_3020 | 70  | 230  | 350  | Gauss | +25°C                                                                  |
|                 |                                       | OHN3120 | 70  | -    | 425  |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3120 | 35  | -    | 450  |       | -40°C to +125°C                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | OH_3020 | 50  | 180  | 330  | Gauss | +25°C                                                                  |
|                 |                                       | OHN3120 | 50  | -    | 405  |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3120 | 25  | -    | 430  |       | -40°C to +125°C                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OH_3020 | 20  | 50   | -    | Gauss | +25°C                                                                  |
|                 |                                       | OHN3120 | 20  | -    | -    |       | -20°C to +85°C                                                         |
|                 |                                       | OHS3120 | 20  | -    | -    |       | -40°C to +125°C                                                        |
| I <sub>CC</sub> | Supply Current                        |         | -   | 4    | 7    | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ 50 Gauss                       |
| V <sub>OL</sub> | Output Saturation Voltage             |         | -   | 100  | 400  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 350 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                |         | -   | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 50 Gauss          |
| t <sub>r</sub>  | Output Rise Time                      |         | -   | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      |         | -   | 0.10 | 1.00 | μs    |                                                                        |

#### Notes:

(1) South pole facing symbolized surface.

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## Electrical Characteristics (V<sub>CC</sub> = 4.5 V to 24 V, T<sub>A</sub> = 25° C unless otherwise noted)

### OHN3030U, OHS3030U, OHN3130U & OHS3130U Uni-Polar

| SYMBOL          | PARAMETER                             | MIN     | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OH_3030 | -    | 205  | 250   | Gauss<br>+25°C<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C           |
|                 |                                       | OH_3130 | -    | -    | 150   |                                                                        |
|                 |                                       | OHN3130 | -    | -    | 175   |                                                                        |
|                 |                                       | OHS3130 | -    | -    | 200   |                                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | OH_3030 | 0    | 160  | -     | Gauss<br>+25°C<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C           |
|                 |                                       | OH_3130 | -150 | -    | -     |                                                                        |
|                 |                                       | OHN3130 | -175 | -    | -     |                                                                        |
|                 |                                       | OHS3130 | -200 | -    | -     |                                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OH_3030 | 20   | 45   | -     | Gauss<br>+25°C<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C           |
|                 |                                       | OH_3130 | 20   | -    | -     |                                                                        |
|                 |                                       | OHN3130 | 20   | -    | -     |                                                                        |
|                 |                                       | OHS3130 | 20   | -    | -     |                                                                        |
| I <sub>CC</sub> | Supply Current                        | -       | 4    | 7    | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ 0 Gauss                        |
| V <sub>OL</sub> | Output Saturation Voltage             | -       | 100  | 400  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 200 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                | -       | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 50 Gauss          |
| t <sub>r</sub>  | Output Rise Time                      | -       | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      | -       | 0.10 | 1.00 | μs    |                                                                        |

### OHN3131U & OHS3131U Uni-Polar

| SYMBOL          | PARAMETER                             | MIN     | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OH_3131 | -75  | -    | 95    | Gauss<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C                    |
|                 |                                       | OHN3131 | -75  | -    | 95    |                                                                        |
|                 |                                       | OHS3131 | -75  | -    | 135   |                                                                        |
|                 |                                       |         |      |      |       |                                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | OH_3031 | -95  | -    | 85    | Gauss<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C                    |
|                 |                                       | OHN3131 | -59  | -    | 85    |                                                                        |
|                 |                                       | OHS3131 | -135 | -    | 125   |                                                                        |
|                 |                                       |         |      |      |       |                                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OH_3031 | 10   | -    | -     | Gauss<br>+25°C<br>-20°C to +85°C<br>-40°C to +125°C                    |
|                 |                                       | OHN3131 | 10   | -    | -     |                                                                        |
|                 |                                       | OHS3131 | 10   | -    | -     |                                                                        |
|                 |                                       |         |      |      |       |                                                                        |
| I <sub>CC</sub> | Supply Current                        | -       | 4    | 7    | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ 0 Gauss                        |
| V <sub>OL</sub> | Output Saturation Voltage             | -       | 100  | 400  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 200 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                | -       | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ 50 Gauss          |
| t <sub>r</sub>  | Output Rise Time                      | -       | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      | -       | 0.10 | 1.00 | μs    |                                                                        |

Notes:

(1) South pole facing symbolized surface.

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## Electrical Characteristics ( $V_{CC} = 4.5\text{ V}$ to $24\text{ V}$ , $T_A = 25^\circ\text{C}$ unless otherwise noted)

### OHN3040U, OHS3040U, OHN3140U, OHS3140U Uni-Polar

| SYMBOL   | PARAMETER                             |         | MIN | TYP  | MAX  | UNITS | TEST CONDITIONS                                                               |
|----------|---------------------------------------|---------|-----|------|------|-------|-------------------------------------------------------------------------------|
| $B_{OP}$ | Magnetic Operate Point <sup>(1)</sup> | OH_3040 | 70  | 150  | 220  | Gauss | +25°C                                                                         |
|          |                                       | OHN3140 | 45  | -    | 260  |       | -20°C to +85°C                                                                |
|          |                                       | OHS3140 | 45  | -    | 270  |       | -40°C to +125°C                                                               |
| $B_{RP}$ | Magnetic Release Point                | OH_3040 | 50  | 115  | 180  | Gauss | +25°C                                                                         |
|          |                                       | OHN3140 | 25  | -    | 240  |       | -20°C to +85°C                                                                |
|          |                                       | OHS3140 | 25  | -    | 250  |       | -40°C to +125°C                                                               |
| $B_H$    | Magnetic Hysteresis                   | OH_3040 | 20  | 35   | -    | Gauss | +25°C                                                                         |
|          |                                       | OHN3140 | 20  | -    | -    |       | -20°C to +85°C                                                                |
|          |                                       | OHS3140 | 20  | -    | -    |       | -40°C to +125°C                                                               |
| $I_{CC}$ | Supply Current                        |         | -   | 4    | 7    | mA    | $V_{CC} = 24\text{ V}$ , Output Off, $B \leq -50\text{ Gauss}$                |
| $V_{OL}$ | Output Saturation Voltage             |         | -   | 100  | 400  | mV    | $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 20\text{ mA}$ , $B \geq 200\text{ Gauss}$ |
| $I_{OH}$ | Output Leakage Current                |         | -   | 0.1  | 10.0 | μA    | $V_{CC} = 24\text{ V}$ , $V_{OUT} = 24\text{ V}$ , $B \leq -50\text{ Gauss}$  |
| $t_r$    | Output Rise Time                      |         | -   | 0.21 | 1.00 | μs    | $R_L = 820\ \Omega$ , $C_L = 20\text{ pF}$ , $V_{CC} = 12\text{ V}$           |
| $t_f$    | Output Fall Time                      |         | -   | 0.10 | 1.00 | μs    |                                                                               |

### OHN3075U, OHS3075U, OHN3175U, OHS3175U Bi-Polar Latch

| SYMBOL   | PARAMETER                             |         | MIN  | TYP  | MAX  | UNITS | TEST CONDITIONS                                                               |
|----------|---------------------------------------|---------|------|------|------|-------|-------------------------------------------------------------------------------|
| $B_{OP}$ | Magnetic Operate Point <sup>(1)</sup> | OH_3075 | 50   | 100  | 250  | Gauss | +25°C                                                                         |
|          |                                       | OH_3175 | 25   | -    | 170  |       | +25°C                                                                         |
|          |                                       | OHN3175 | 15   | -    | 180  |       | -20°C to +85°C                                                                |
|          |                                       | OHS3175 | 10   | -    | 260  |       | -40°C to +125°C                                                               |
| $B_{RP}$ | Magnetic Release Point                | OH_3075 | -250 | -100 | -50  | Gauss | +25°C                                                                         |
|          |                                       | OH_3175 | -170 | -    | -25  |       | +25°C                                                                         |
|          |                                       | OHN3175 | -180 | -    | -15  |       | -20°C to +85°C                                                                |
|          |                                       | OHS3175 | -260 | -    | -10  |       | -40°C to +125°C                                                               |
| $B_H$    | Magnetic Hysteresis                   | OH_3075 | 100  | 200  | 500  | Gauss | +25°C                                                                         |
|          |                                       | OH_3175 | 100  | -    | -    |       | +25°C                                                                         |
|          |                                       | OHN3175 | 80   | -    | -    |       | -20°C to +85°C                                                                |
|          |                                       | OHS3175 | 50   | -    | -    |       | -40°C to +125°C                                                               |
| $I_{CC}$ | Supply Current                        |         | -    | 4    | 7    | mA    | $V_{CC} = 24\text{ V}$ , Output Off, $B \leq -250\text{ Gauss}$               |
| $V_{OL}$ | Output Saturation Voltage             |         | -    | 100  | 400  | mV    | $V_{CC} = 4.5\text{ V}$ , $I_{OL} = 20\text{ mA}$ , $B \geq 250\text{ Gauss}$ |
| $I_{OH}$ | Output Leakage Current                |         | -    | 0.1  | 10.0 | μA    | $V_{CC} = 24\text{ V}$ , $V_{OUT} = 24\text{ V}$ , $B \leq -250\text{ Gauss}$ |
| $t_r$    | Output Rise Time                      |         | -    | 0.21 | 1.00 | μs    | $R_L = 820\ \Omega$ , $C_L = 20\text{ pF}$ , $V_{CC} = 12\text{ V}$           |
| $t_f$    | Output Fall Time                      |         | -    | 0.10 | 1.00 | μs    |                                                                               |

#### Notes:

(1) South pole facing symbolized surface.

#### General Note

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## Electrical Characteristics (V<sub>CC</sub> = 4.5 V to 24 V, T<sub>A</sub> = 25° C unless otherwise noted)

### OHN3177U, OHS3177U Bi-Polar Latch

| SYMBOL          | PARAMETER                             | MIN     | TYP  | MAX  | UNITS | TEST CONDITIONS                                                        |
|-----------------|---------------------------------------|---------|------|------|-------|------------------------------------------------------------------------|
| B <sub>OP</sub> | Magnetic Operate Point <sup>(1)</sup> | OH_3177 | 50   | -    | 150   | +25°C<br>-20°C to +85°C<br>-40°C to +125°C                             |
|                 |                                       | OHN3177 | 25   | -    | 150   |                                                                        |
|                 |                                       | OHS3177 | 25   | -    | 200   |                                                                        |
| B <sub>RP</sub> | Magnetic Release Point                | OH_3177 | -150 | -    | -50   | +25°C<br>-20°C to +85°C<br>-40°C to +125°C                             |
|                 |                                       | OHN3177 | -150 | -    | -25   |                                                                        |
|                 |                                       | OHS3177 | -200 | -    | -25   |                                                                        |
| B <sub>H</sub>  | Magnetic Hysteresis                   | OH_3177 | 100  | -    | -     | +25°C<br>-20°C to +85°C<br>-40°C to +125°C                             |
|                 |                                       | OHN3177 | 50   | -    | -     |                                                                        |
|                 |                                       | OHS3177 | 50   | -    | -     |                                                                        |
| I <sub>CC</sub> | Supply Current                        | -       | 4    | 7    | mA    | V <sub>CC</sub> = 24 V, Output Off, B ≤ -250 Gauss                     |
| V <sub>OL</sub> | Output Saturation Voltage             | -       | 100  | 400  | mV    | V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 20 mA, B ≥ 250 Gauss        |
| I <sub>OH</sub> | Output Leakage Current                | -       | 0.1  | 10.0 | μA    | V <sub>CC</sub> = 24 V, V <sub>OUT</sub> = 24 V, B ≤ -250 Gauss        |
| t <sub>r</sub>  | Output Rise Time                      | -       | 0.21 | 1.00 | μs    | R <sub>L</sub> = 820 Ω, C <sub>L</sub> = 20 pF, V <sub>CC</sub> = 12 V |
| t <sub>f</sub>  | Output Fall Time                      | -       | 0.10 | 1.00 | μs    |                                                                        |

#### Notes:

(1) South pole facing symbolized surface.

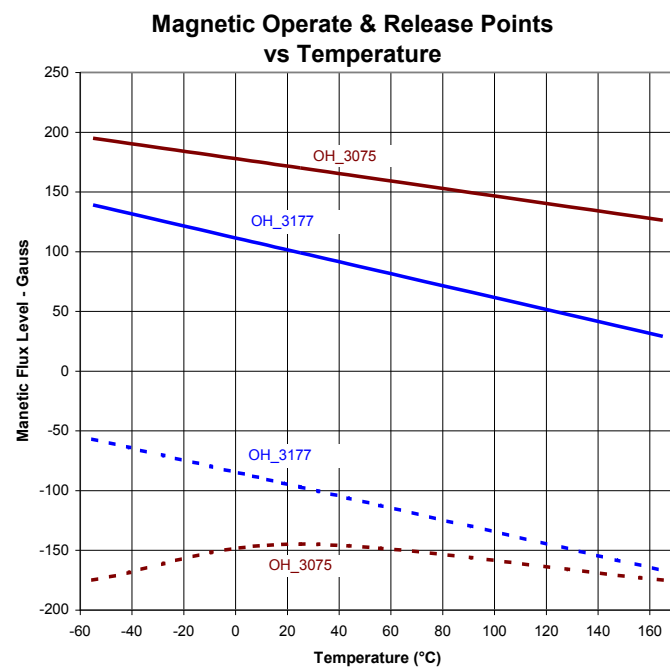
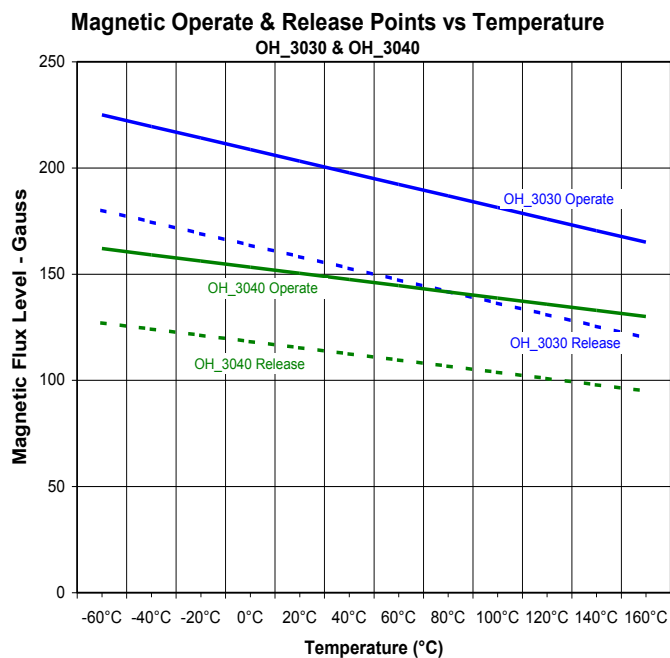
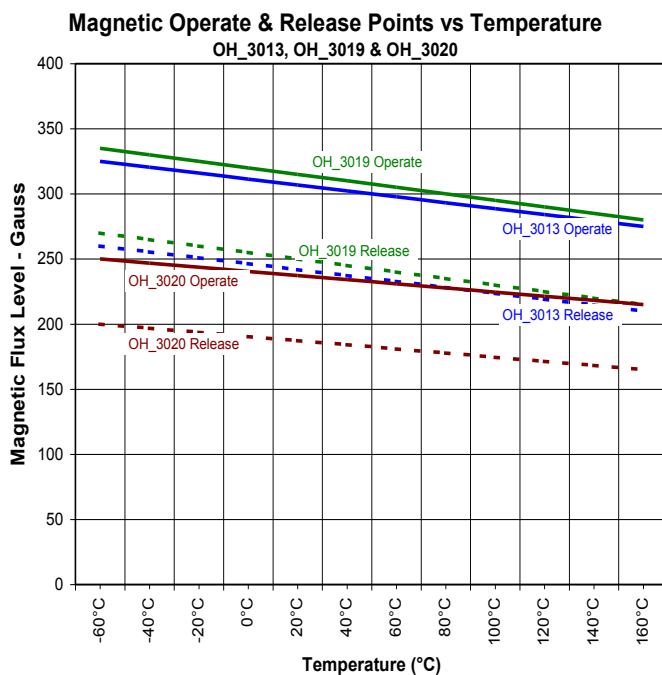
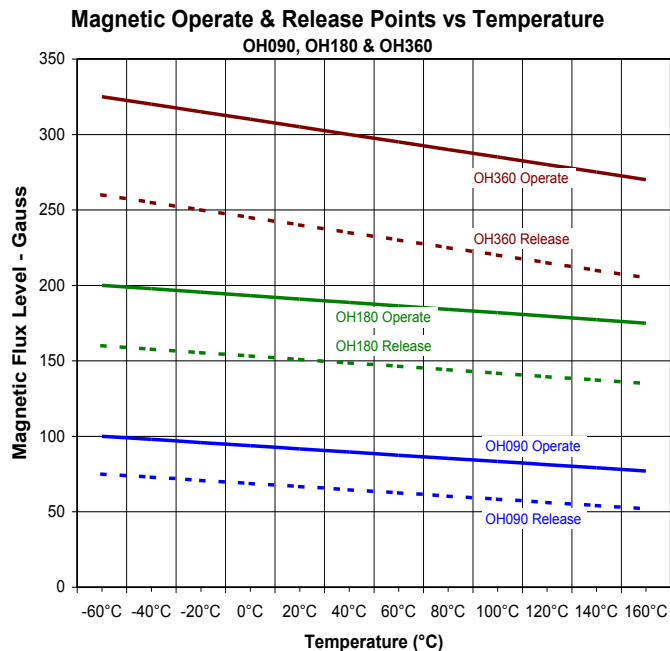
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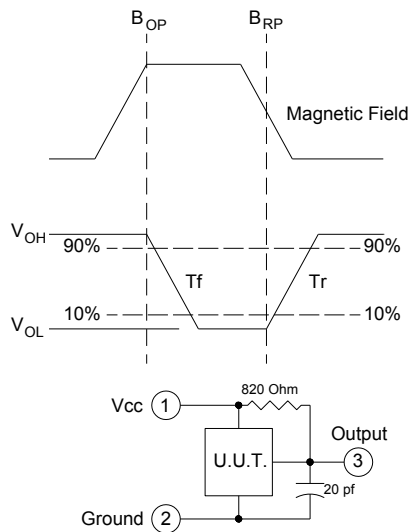


## Typical Operate & Release Points

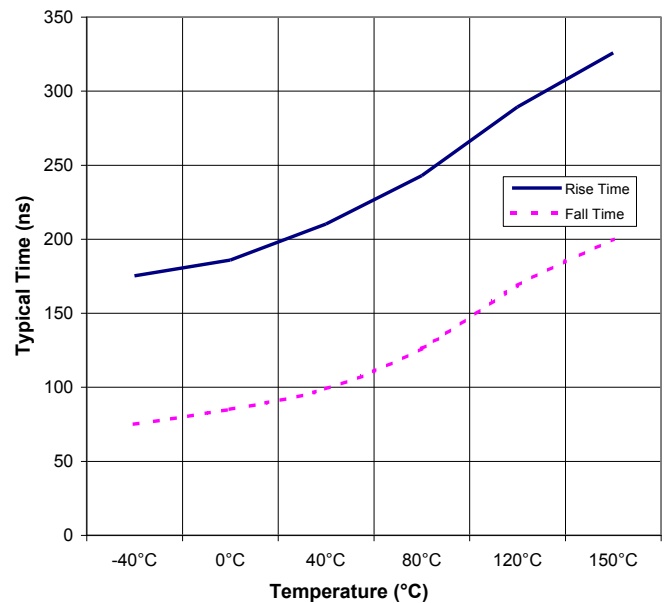


### General Note

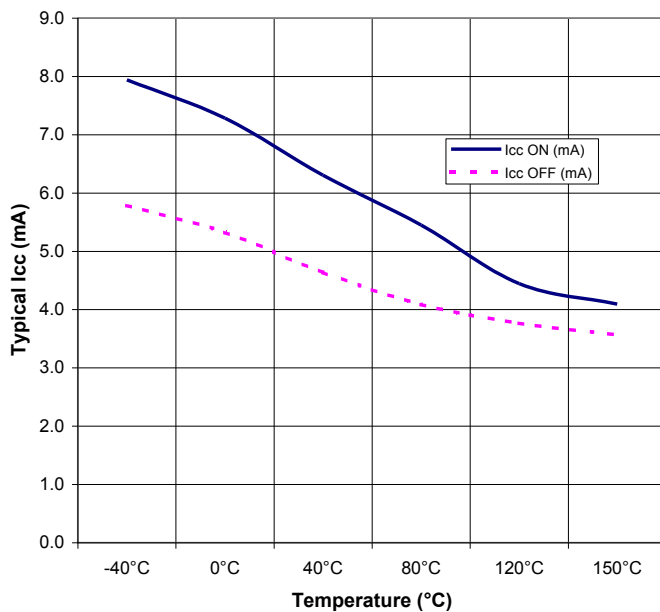
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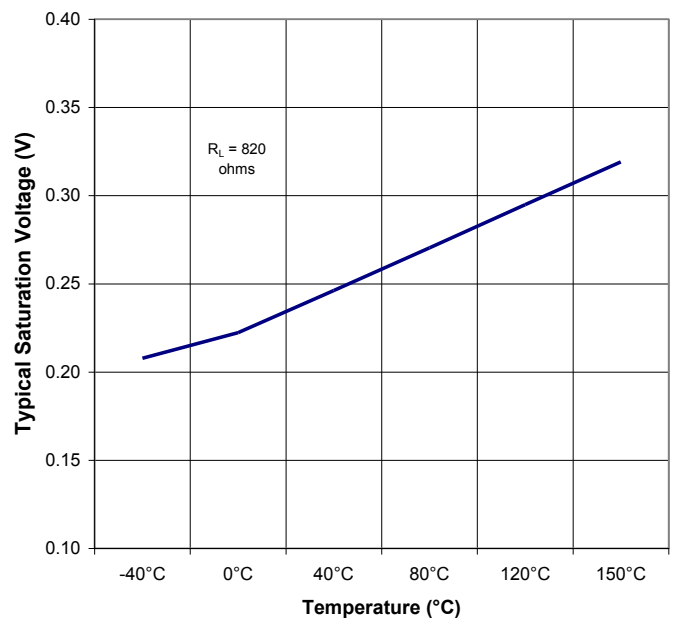
Rise & Fall Time vs Temperature



Icc vs Temperature



Saturation Voltage vs Temperature



## General Note

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