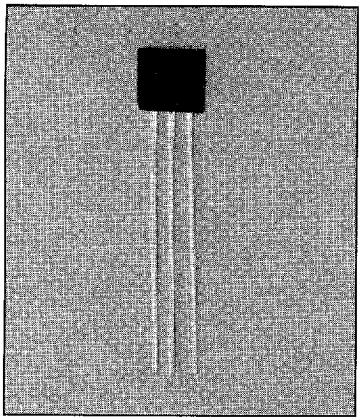
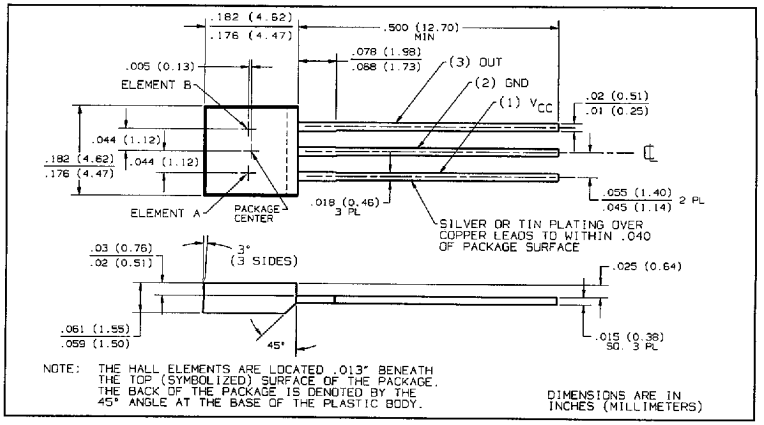
**PRELIMINARY**

# Hallogic® Differential Magnetic Sensors
# Types OHN3056, OHS3056






## Features

- Designed for use as gear tooth sensor
- Reverse battery protection
- Zero speed sensing
- -40° C to +150° C operating temperature
- 4.5 to 24 volts supply range

## Description

The OHN3056 & OHS3056 contains a monolithic integrated circuit which incorporates a pair of Hall sensing elements, linear signal amplifiers, and a hysteresis threshold detector on a single silicon chip. The chip also includes a bandgap voltage regulator and temperature compensation circuitry to provide a stable operation over a wide range of temperatures and supply voltages. The device has an open collector logic output with 20 mA sink current capability and has an optional on chip pull-up resistor.

The device has two Hall elements spaced 0.088 inches (2.24 millimeters) apart. The Hall elements are connected to two separate linear amplifiers whose outputs are connected to a third differential amplifier. The output of the differential amplifier represents only the difference in magnetic flux density between the two Hall elements. The output of the differential amplifier is coupled to the threshold detector, and when the difference in the magnetic flux density exceeds the threshold, the logic output changes states.

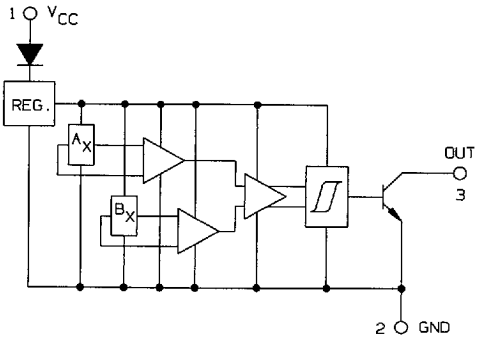
The device is designed for use as a single sided gear tooth sensor. By placing a bias magnet behind the device and passing a ferrous metal target over the package surface, a large flux density differential is easily created.

## Absolute Maximum Ratings ($T_A$ = 25° C unless otherwise noted)

| | |
|---|---|
| Supply Voltage, $V_{CC}$ | 26 V |
| Storage Temperature Range, $T_S$ | -65° C to +160° C |
| Operating Temperature Range, $T_A$ OHS3056 | -40° C to +150° C |
| Operating Temperature Range, $T_A$ OHN3056 | -20° C to +85° C |
| Lead Soldering Temperature (1/8 inch [3.2 mm] from case for 5 sec. with soldering iron) | 260° C(1) |
| Output ON Current, $I_{SINK}$ | 25 mA |
| Output OFF Voltage, $V_{OUT}$ | 26 V |
| Magnetic Flux Density, B | Unlimited |
| Reverse Battery Voltage, $V_{RCC}$ | 26 V |

**Notes:**
(1) Heat sink leads during hand soldering.

## Functional Block Diagram

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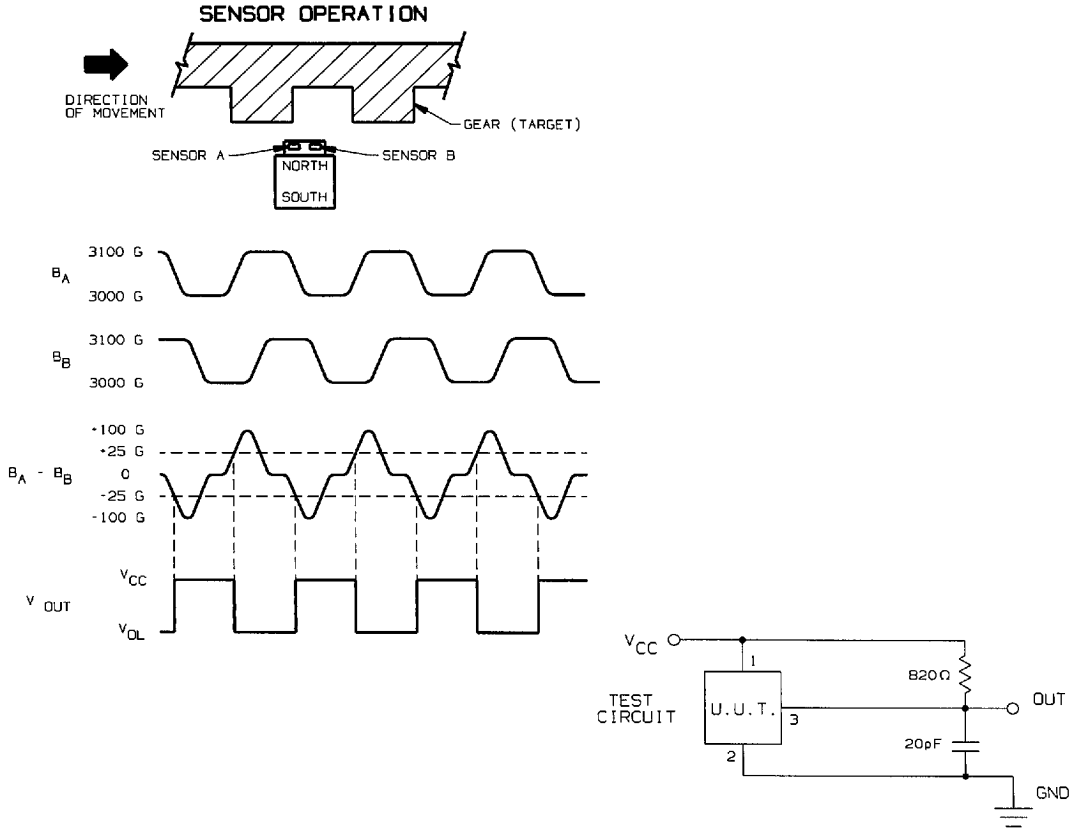
**Electrical Characteristics** ($V_{CC}$ = 4.5 to 24 V)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| $\Delta B_{OP}$ | Magnetic Operate Point[4], $B_A$[2] -$B_B$[3] | | | 150 | Gauss | $T_A$ = 25° C |
| $\Delta B_{RP}$ | Magnetic Release Point, $B_A$[2] -$B_B$[3] | -150 | | | Gauss | $T_A$ = 25° C |
| $B_H$ | Magnetic Hysteresis, $\Delta B_{OP}$ -$\Delta B_{OP}$ | | 50 | | Gauss | TA = 25° C |
| $I_{CC}$ | Supply Current | | | 10.0 | mA | $V_{CC}$ = 24 V, Output Off, $\Delta B \leq$ -150 Gauss |
| $V_{OL}$ | Output Saturation Voltage | | 160 | 400 | mV | $V_{CC}$ = 4.5 V, $I_{OL}$ = 20 mA, $\Delta B \geq$ 150 Gauss |
| $I_{OH}$ | Output Leakage Current | | 0.1 | 5.0 | µA | $V_{CC}$ = 24 V, $V_{OUT}$ = 24 V, $\Delta B \leq$ -150 Gauss |
| $t_r$ | Output Rise Time | | 0.05 | 1.00 | µs | $R_L$ = 820 Ω, $C_L$ = 20 pF, $V_{CC}$ = 14 V |
| $t_f$ | Output Fall Time | | 0.12 | 1.00 | µs | |

Notes:
2) $B_A$ is the magnetic flux density at Hall Element A.
3) $B_B$ is the magnetic flux density at Hall Element B.
4) South pole facing symbolized surface.









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