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| Unipolar Hall Effect Switch IC |
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**Features:**

- Operates from 2.4V to 26V supply voltage with reverse voltage protection
- Operates with magnetic fields from DC to 15kHz
- On-chip Hall Sensor
- On-chip temperature compensation circuitry minimizes shifts in on and off points and hysteresis over temperature and supply voltage
- Ideal sensor for speed measurement, revolution counting, positioning, and DC brushless motors
- On (L) with magnetic **South** pole and Off(H) without magnetic field or with magnetic **North** pole

**Functional Description :**

WSH130NL is designed to integrate Hall sensor with output driver together on the same chip, it is suitable for speed measurement, revolution counting, positioning. It includes a temperature compensated voltage regulator, a differential amplifier, a Hysteresis controller and a open-collector output driver capable of sinking up to 20mA current load. An on-chip protection resistor is implemented to prevent reverse power fault.

The temperature-dependent bias increases the supply voltage of the hall plates and adjusts the switching points to the decreasing induction of magnets at higher temperatures. Subsequently, the output can keep switching on/off on more precise switch point regardless to the ambient temperature. WSH130NL are rated for operation over temperature range from  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$  and voltage ranges from 2.4V to 26V.

**Pin Descriptions:**

| <b>Name</b> | <b>P/I/O</b> | <b>Pin#</b> | <b>Description</b>    |
|-------------|--------------|-------------|-----------------------|
| Vdd         | P            | 1           | Positive Power Supply |
| Gnd         | O            | 2           | Ground                |
| Vout        | O            | 3           | Output Pin            |

**Absolute Maximum Rating (at  $T_a=25^{\circ}\text{C}$ )**

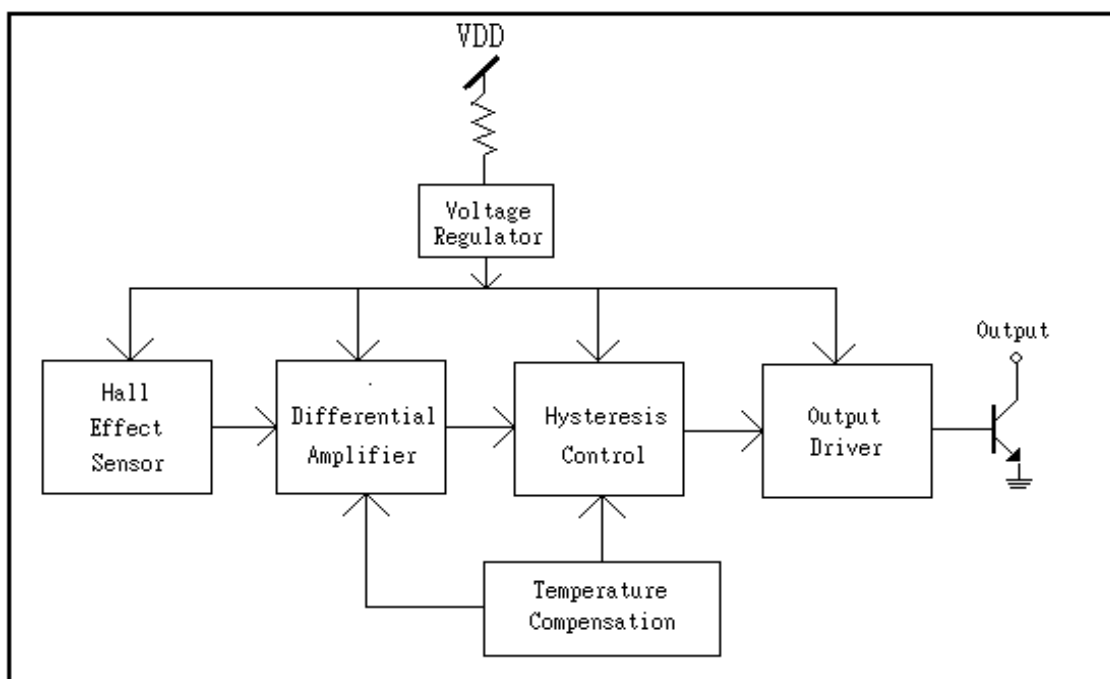
Winson reserves the right to make changes to improve reliability or manufacturability.

|                                |     |                   |
|--------------------------------|-----|-------------------|
| Supply Voltage                 | Vcc | 26V               |
| Magnetic flux density          | B   | Unlimited         |
| Reverse Protection Voltage     | Vr  | 26V               |
| Output ON Current (continuous) | Ic  | 25mA              |
| Operating Temperature Range    | Ta  | (-40°C to +125°C) |
| Storage Temperature Range      | Ts  | (-65°C to +150°C) |
| Package Power Dissipation      | Pd  | 500mw             |

Electrical Characteristics: (T=+25°C, Vcc=2.4V to 26V)

| Characteristic            | Symbol     | Test Conditions             | Min | Typ  | Max | Units |
|---------------------------|------------|-----------------------------|-----|------|-----|-------|
| Supply Voltage            | Vcc        | —                           | 2.4 | —    | 26  | V     |
| Output Saturation Voltage | Vout (sat) | Vcc=12V, Ic=10mA<br>B > Bop | —   | 0.2  | 0.6 | V     |
| Output Leakage Current    | Ileakage   | Vcc=12V, B < Brp            | —   | <0.1 | 10  | uA    |
| Supply Current            | Isupply    | Vcc=12V, Output Open        | —   | 2.0  | 5   | mA    |
| Output Rise Time          | Tr         | Vcc=12V, RL=2K<br>Ω CL=20Pf | —   | 1.0  | 10  | μs    |
| Output Falling Time       | Tf         | Vcc=12V, RL=2K<br>Ω CL=20Pf | —   | 0.3  | 1.5 | μs    |

Function Block:




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## Magnetic Characteristics:

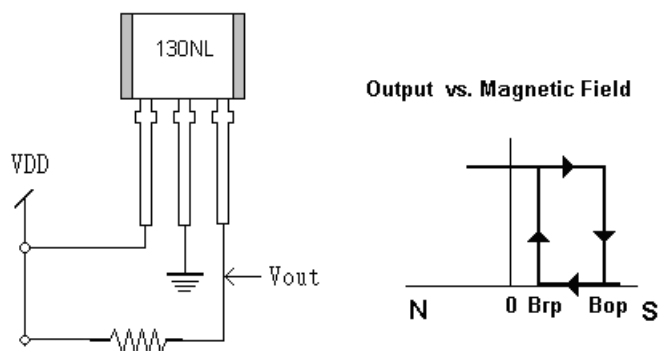
| Characteristic    | Symbol | Grade | Min. | Typ. | Max. | Unit  |
|-------------------|--------|-------|------|------|------|-------|
| Operating Point   | Bop    | A     |      |      | + 50 | Gauss |
|                   |        | B     |      |      | +70  | Gauss |
|                   |        | C     |      |      | +150 | Gauss |
| Release Point     | Brp    | A     | +10  |      |      | Gauss |
|                   |        | B     | +10  |      |      | Gauss |
|                   |        | C     | +10  |      |      | Gauss |
| Hysteresis Window | Bhys   |       |      | 10   | 30   | Gauss |

\*+ mean South magnetic field, 1mT=10 Gauss

## Order Information:

|  |  |
|--|--|
| WSH130NL-XPAN □ (T0-92 )   | Grade:<br>1: 50 Gauss<br>2: 70 Gauss<br>5: 150 Gauss |
| WSH130NL-XPCN □ (SOT23)  |  |
|  Grade<br><b>Halogen Free</b> |  |

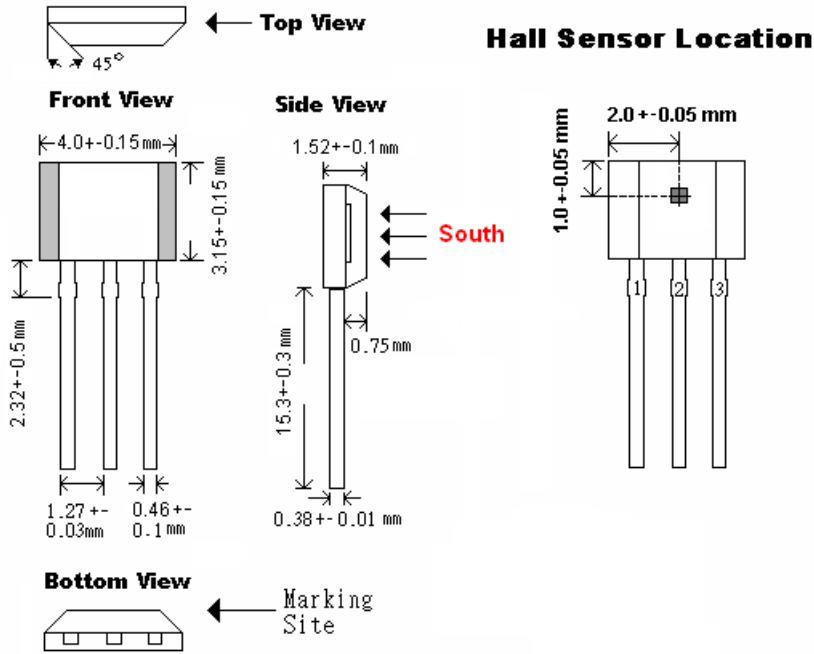
## Application Circuit:



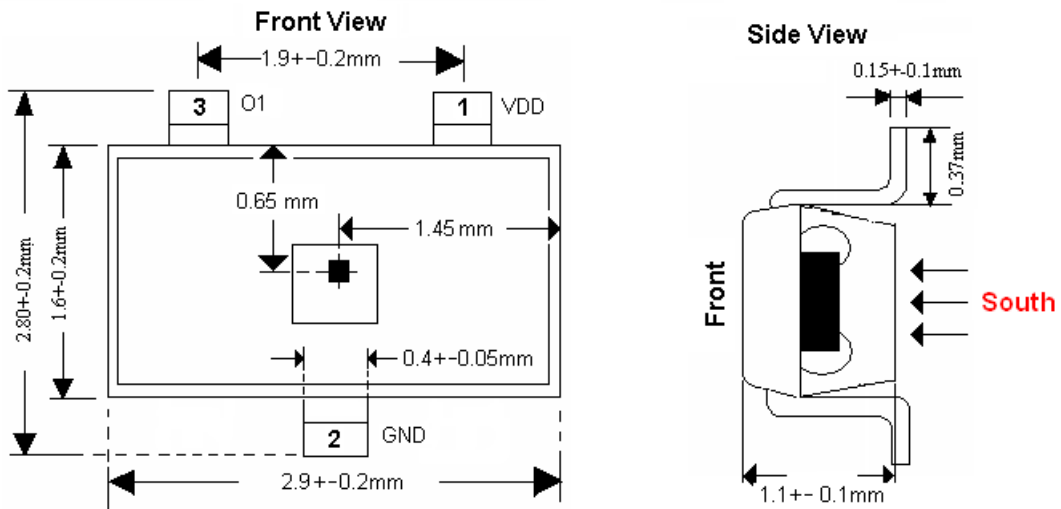
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Package Information:

TO-92S:



SOT23:



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