

Omnipolar Hall Effect Switch IC

Features

- Operates from 2.4 V to 26 V supply voltage
- Operation with North or South Pole
- On-chip Hall Sensor and driver
- On-chip temperature compensation circuitry minimizes shifts in on and off points and hysteresis over temperature and supply voltage
- On-chip voltage regulator to stabilize On/Off switch point
- Wide range operating temperature -20 ~ 85°C
- **On** (L) with **South** or **North** magnetic field and **Off** (H) with **No** magnetic field

Functional Description

WSH131 is designed to integrate pole independent Hall sensor with output driver together on the same chip. Either **North** or **South** magnetic field with sufficient strength will turn the output on (low). In the absence of a magnetic field, output is off (high). The polarity independence allow WSH131 to easily replace reed switches for superior reliability and ease of manufacturing.

To improve stability, 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. 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. WSH131 are rated for operation over temperature range from -20°C to +85°C and voltage ranges from 2.4 V to 26 V.

Pin Definition

Name	P / I / O	Pin#	Description
Vdd	P	1	Positive Power Supply
Gnd	O	2	Ground
Vout	O	3	Output Pin

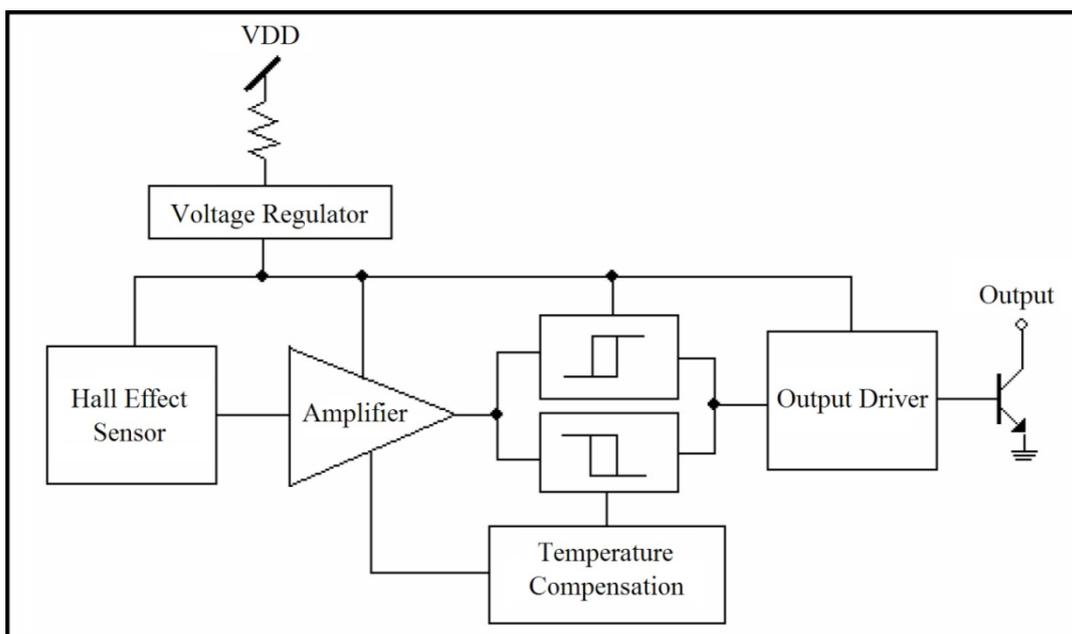
Winson reserves the right to make changes to improve reliability or manufacturability.

Absolute Maximum Rating (at Ta = 25°C)

Supply Voltage	V _{cc}	-----	26 V
Output breakdown Voltage	V _{out(breakdown)}	-----	26 V
Magnetic flux density	B	-----	Unlimited
Reverse Protection Voltage	V _r	-----	26 V
Output ON Current (continuous)	I _c	-----	25 mA
Operating Temperature Range	T _a	-----	-20°C to +85°C
Storage Temperature Range	T _s	-----	-65°C to +150°C
Power Dissipation	P _d		
	TO-92S	-----	500 mW
	SOT-23	-----	400 mW

Electrical Characteristics
(T = +25 °C, V_{cc} = 2.4 V to 26V)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V _{cc}	—	2.4	—	26	V
Output Saturation Voltage	V _{out (sat)}	V _{cc} =12V, I _c =10mA, B>B _{op}	—	0.2	0.6	V
Output Leakage Current	I _{leakage}	V _{cc} =12V, B<B _{rp}	—	< 0.1	10	μA
Supply Current	I _{supply}	V _{cc} =12V, Output Open	—	3.0	6	mA

Function Block


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

Magnetic Characteristics

Characteristic	Symbol	Grade	Min.	Typ.	Max.	Unit
Operating Point	Bop	A	±20		±100	Gauss
		B	±20		±150	Gauss
Release Point	Brp	A	±10			Gauss
		B	±10			Gauss
Hysteresis Window	Bhys			10	30	Gauss

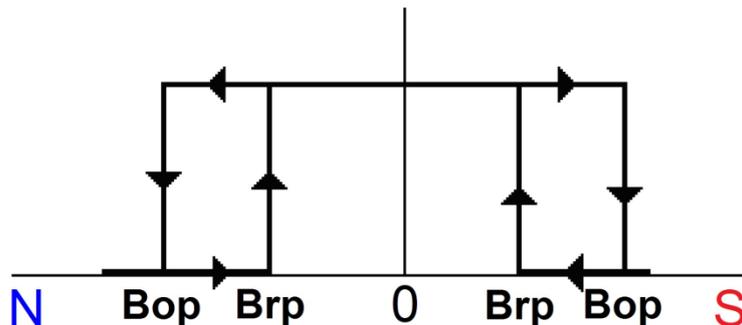
★ "+" means South magnetic field.

★ 1 mT = 10 Gauss

Ordering Information

WSH131-XPAN□ (TO-92) WSH131-XPCN□ (SOT23) ↑ Grade Halogen Free	Grade: 3: 100 Gauss 5: 150 Gauss
---	--

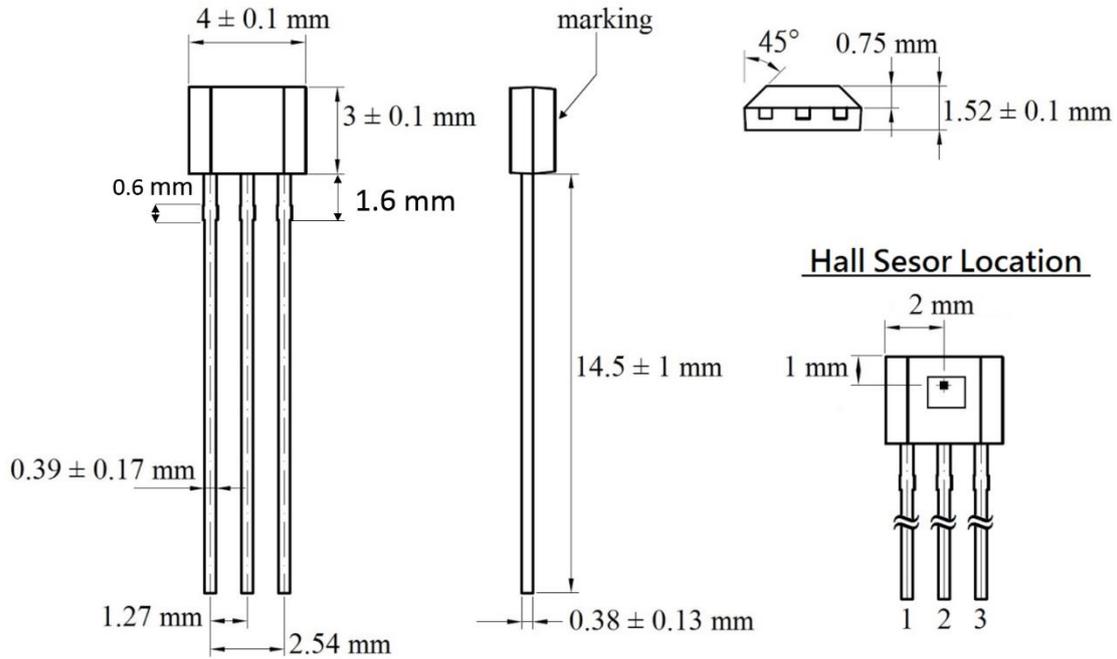
Output vs. Magnetic Field



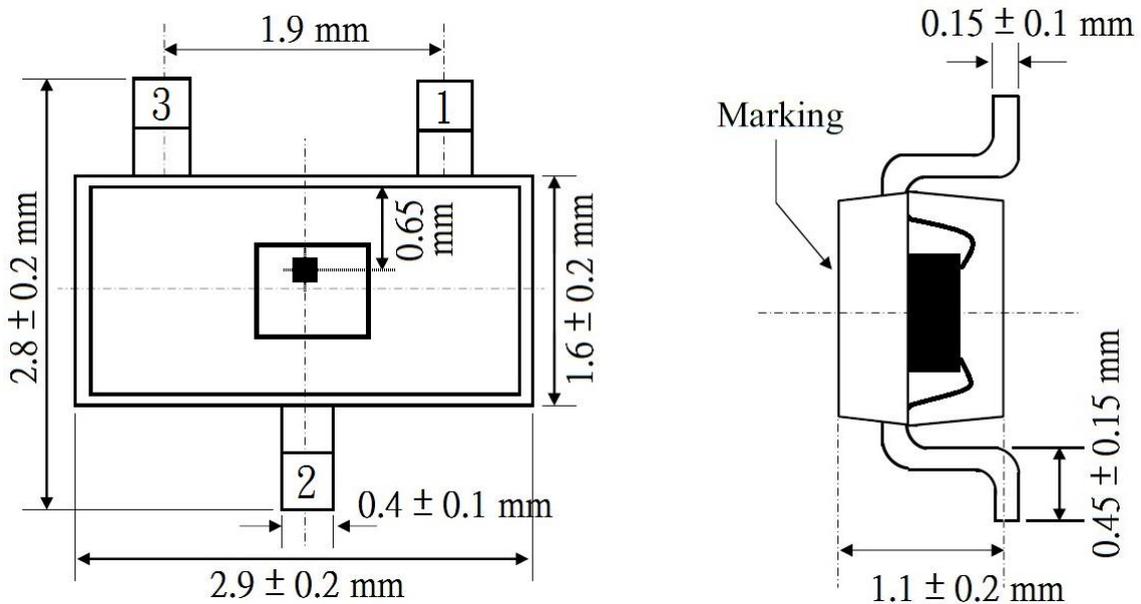
Winson reserves the right to make changes to improve reliability or manufacturability.

Package Information

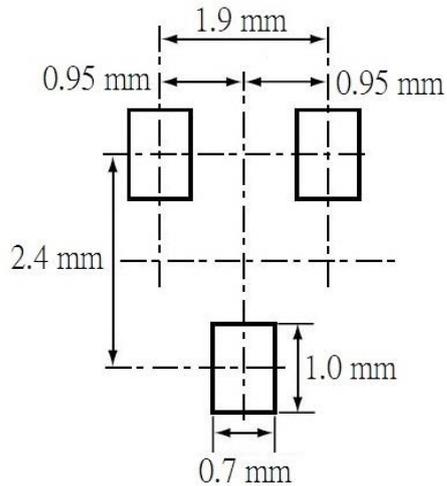
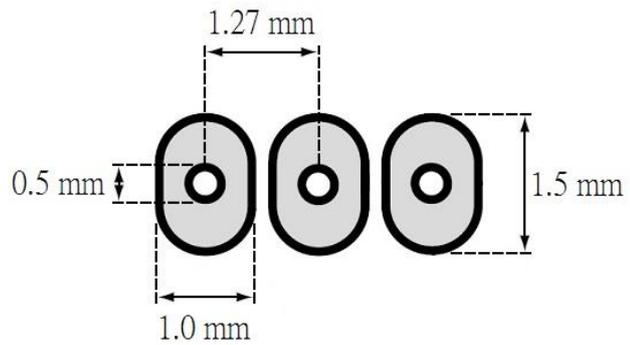
《TO-92S》



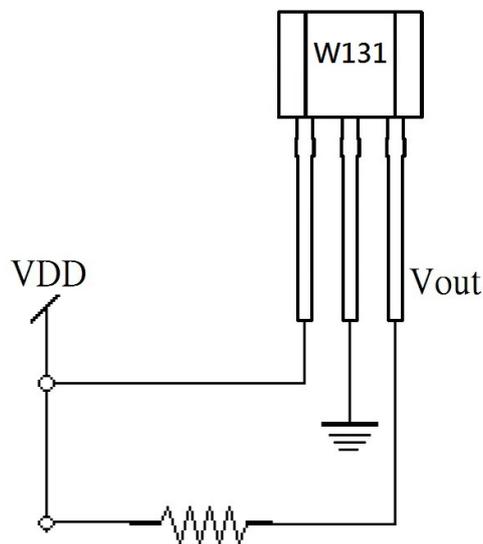
《SOT-23》



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

PCB Layout Reference ViewSOT-23TO-92S**Application Circuit**

《Magnetic field detector》



Precautions for the use of Hall Sensor IC: please refer to Winson Website->

Products->Application Note ->Hall Sensor IC Application Note:

<http://www.winson.com.tw/Product/83>

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