

## General Description

HAL501U Hall-effect switch integrated circuits for high temperature operating based on Hall-effect principle, apply the semiconductor monolithic technology, which includes a voltage regulator, Hall voltage generator, differential amplifier, Schmitt trigger and an open-collector output on a single silicon chip. ICs can convert the input magnetic field signal into digital voltage output.

## Features

Small size

High Sensitivity

Quick Response

Good Temperature Performance

High Accuracy

Excellent Reliability

## Typical applications

Non-contact Switch

Automotive Ignition

Position control

Revolution detection

Safe alarm device

Textile control system

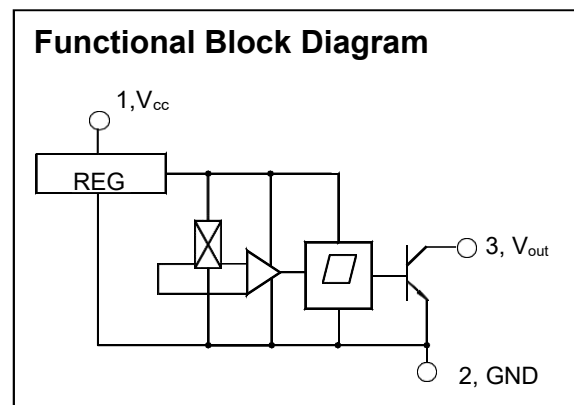
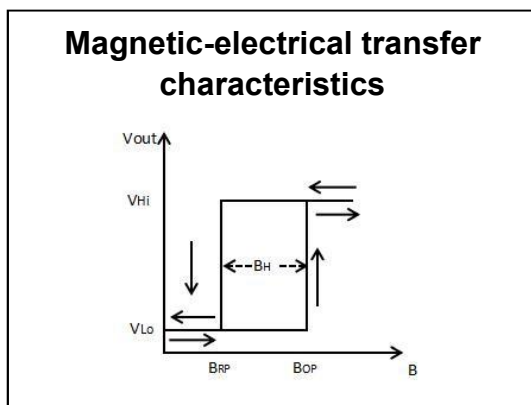
## Absolute Maximum Rating

Supply Voltage  $V_{CC}$ .....V

Output Current  $I_O$ ..... 50mA

Operating Temperature Range  $T_A$ ..... -40~150°C,

Storage Temperature Range  $T_S$ ..... -65~150°C



**Electrical Characteristics**  $T_A=25^{\circ}\text{C}$ 

Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage	$V_{CC}=4.5\text{V} \sim 24\text{V}$	$V_{CC}$	3.8	-	30	V
Output Low Voltage	$V_{CC}=4.5\text{V}$ , $V_o=24\text{V}$ $I_o=20\text{mA}$ , $B \geq \text{BOP}$	VOL	-	175	400	mV
Output Leakage Current	$V_o=24\text{V}$ , $B < \text{BRP}$	IOH	-	<1.0	10	$\mu\text{A}$
Supply Current	$V_{CC}=24\text{V}$ $V_o$ open-collector output	$I_{CC}$	-	6	10	mA
Output Rise time	$V_{CC}=12\text{V}$ $R_L=820\ \Omega$ $C_L=20\text{pF}$	tr	-	0.2	1.5	$\mu\text{s}$
Output Fall time		tf	-	0.18	1.5	$\mu\text{s}$
Frequency		F		100		KHz

**Magnetic Characteristics** (Unit: mT)

Parameter	symbol	Value			Unit
		Min	Typ	Max	
Operate Point	$B_{OP}$	6	12	16	mT
Release Point	$B_{RP}$	2	7	11	mT
Hysteresis	$B_{hys}$		5		mT

**Order Information**

Model	HAL501U	Operating Temperature	-40~150°C	Package	TO-92S	1000pcs/bag
					SOT-23-3	3000pcs/reel

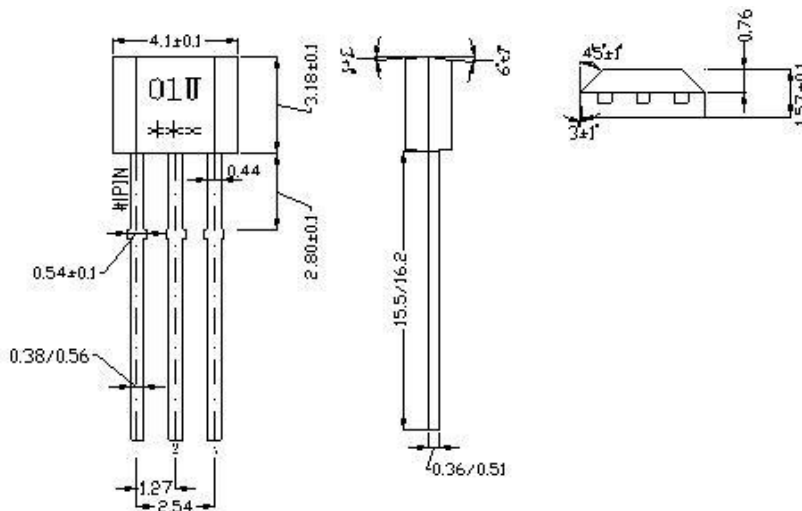
**Output Behaviour versus Magnetic Pole**

DC Operating Parameters  $T_A = -40\text{ C to }150\text{ C}$ ,  $V_{DD} = 2.5\text{V to }24\text{V}$  (unless otherwise specified)

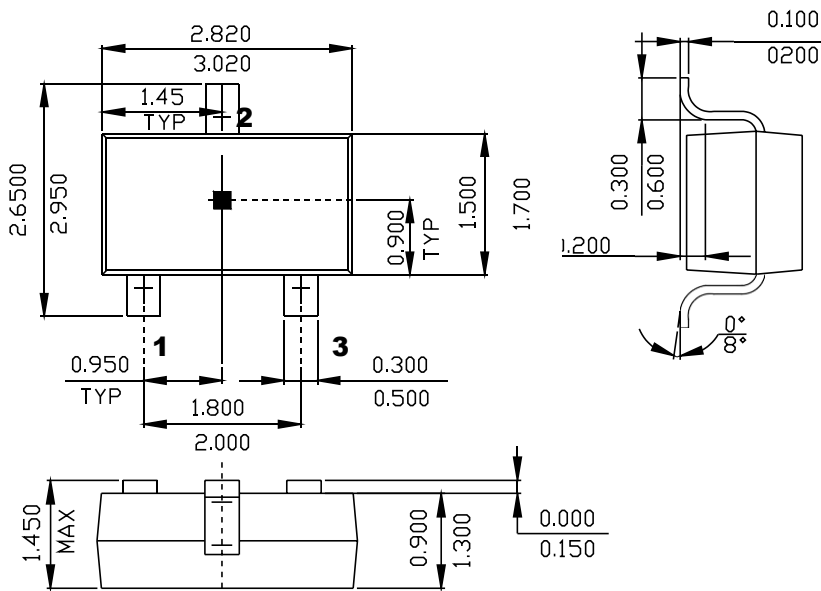
Parameter	Test Conditions	OUT
South pole (TO)	$B > B_{OP}$	High
North pole (SOT)	$B > B_{OP}$	High
Null or weak magnetic field	$B = 0$ or $B < B_{RP}$	Low

**Package (unit :mm)**

**1、TO-92S:**



**2、SOT-23**



**PIN NOTES:** 1.VCC 2.Ground 3.Output

**NOTE:**

- ◆ Mechanical Stress Should be lessened as far as possible in the process of assembly, and add one 1K pull-up Resistor between Pin1 and Pin 3.
- ◆ The soldering temperature at the leads should be less than 260 °C with 5 seconds.

Ordering Information

Part No.	Package Code	Mini packing
HAL501US0	S0 (SOT-23-3L)	3000PCS
HAL501UUA	UA (T092S)	1000PCS