



Single Coil Hall Effect IC with Thermal Lock Protection and Auto-Restart

Features:

- Operate from 2.4V to 15V supply voltage.
- On-chip Hall sensor.
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range.
- Output sinking capability up to 450mA for driving large load.
- Lower current change rate reduces the peak output voltages during switching.
- Available in rugged low profile SIP-4L packages.
- Built-in protection resistance for reverse power supply fault.
- Built-in **thermal lock protection** and **auto-restart** function.

General Description:

WSH420 is designed to integrate Hall sensor with two push-pull output drivers and frequency generator together on the same chip, it is suitable for single coil DC brushless motors. It includes a temperature compensated voltage regulator, a differential amplifier, a Hysteresis controller, complementary bi-direction drivers for sinking and driving large current load. An on-chip protection resistor is implemented to prevent reverse power fault. And built-in **thermal lock protection** and **auto-restart** function will automatically shutdown power at 120°C to prevent the coils be damaged during high temperature and auto-restart at 115°C. It can replace the function of lock protection and auto-restart at low cost.

WSH420 are rated for operation over temperature range from -20° C to 85°C and voltage ranges from 2.4V to 15V.

Pin Descriptions: (SIP-4L)

| Name | P/I/O | Pin# | Description |
|------|-------|------|-----------------------|
| Vcc | P | 1 | Positive Power Supply |
| DOB | O | 2 | Output Pin #1 |
| DO | O | 3 | Output Pin #2 |
| Vss | P | 4 | Ground |

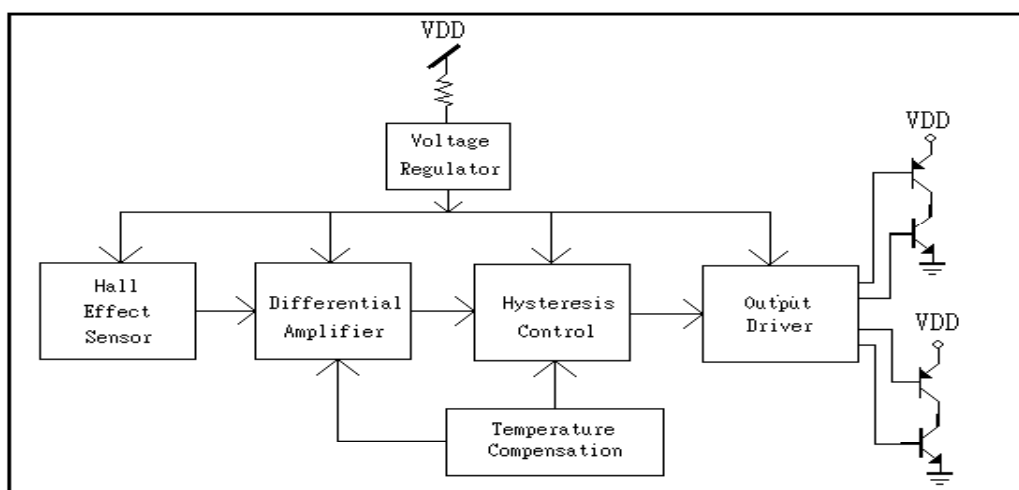
Winson reserves the right to make changes to improve reliability or manufacturability.

Absolute Maximum Rating (at Ta=25° C)

| | | | |
|-----------------------------|-----|-------|-------------------|
| Supply Voltage | Vcc | ----- | 15V |
| Magnetic flux density | B | ----- | Unlimited |
| Reverse Protection Voltage | Vr | ----- | 15V |
| Output Lock Current | Ic | ----- | 450mA |
| Operating Temperature Range | Ta | ----- | (-20°C to +85°C) |
| Storage Temperature Range | Ts | ----- | (-65°C to +150°C) |
| Package Power Dissipation | Pd | ----- | 500mw for SIP-4L |

Electrical Characteristics:
(T=+25°C, Vcc=2.4V to 15V)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Units |
|---------------------------|---------------------------|------------------------------|-----|------|-----|-------|
| Supply Voltage | Vcc | — | 2.4 | — | 15 | V |
| Output Saturation Voltage | Vout(sat) Vdrive+Vsink | Vcc=12V, Io=200mA | — | 0.6 | 1.0 | V |
| Output Leakage Current | Ileakage | Vcc=12V, B < Brp | — | <0.1 | 10 | uA |
| Supply Current | Isupply | Vcc=12V, Io=200mA FG “ON” | — | 22 | 30 | mA |

Function Block:


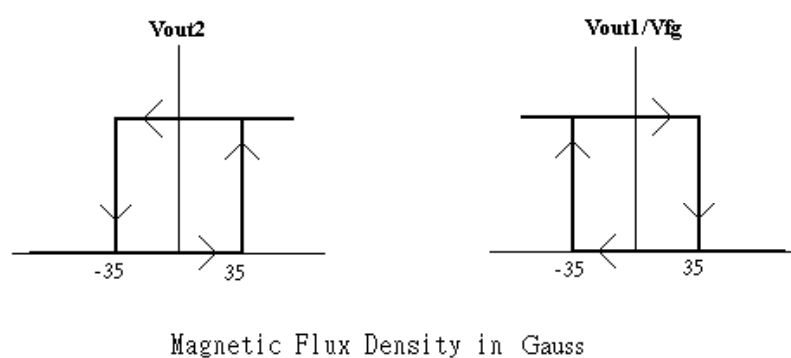
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Magnetic Characteristics:

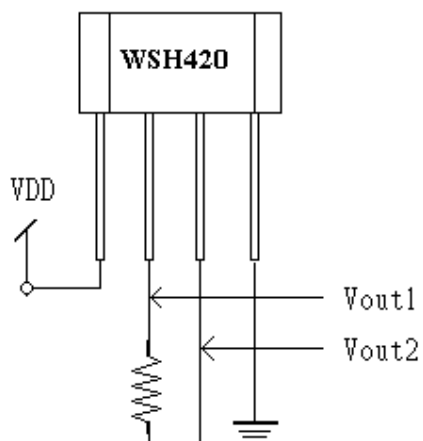
| Characteristics | Symbol | Quantity | Ta= -20°C to +90°C | | | Unit |
|-------------------|---------|----------|--------------------|------|-----|-------|
| | | | Min | Typ. | Max | |
| Operate Point | Bop | A | | 35 | 50 | Gauss |
| | | Grade B | | 50 | 70 | |
| | | C | | | 120 | |
| Release Point | Brp | A | -50 | -35 | | Gauss |
| | | Grade B | -70 | -50 | | |
| | | C | -120 | | | |
| Hysteresis Window | Bop-Brp | | | 40 | 80 | Gauss |

Ordering Information:

| | |
|--|---|
| SIP -4L: WSH420-XPAN <input type="checkbox"/> <div style="text-align: center; margin-top: 20px;"> <div style="border-left: 1px solid black; border-bottom: 1px solid black; width: 50px; height: 50px; margin: 0 auto;"></div> Elec. Grade </div> | Elec. Grade |
| | SIP-4L: 1: A Grade (50 Gauss) 2: B Grade (70 Gauss) 3: C Grade (120 Gauss) |

WSH420 Complementary Output1/Vfg vs. Output2


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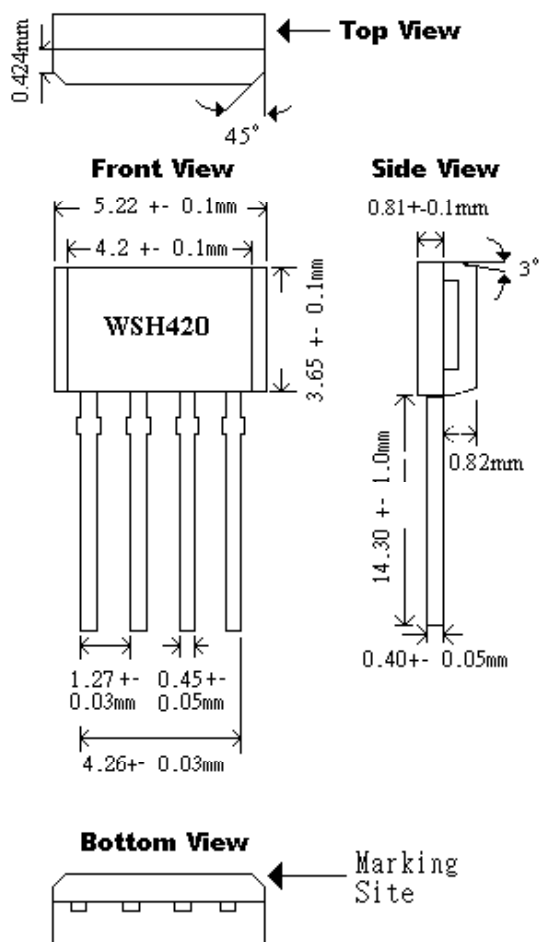
Testing Circuit

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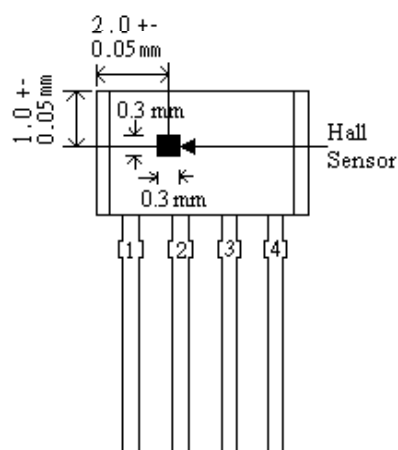
Package Information:

1. SIP-4L

Package Dimension



Hall Sensor Location



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Application Circuit:

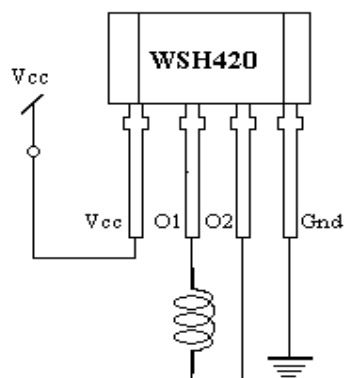


Figure 1.