



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

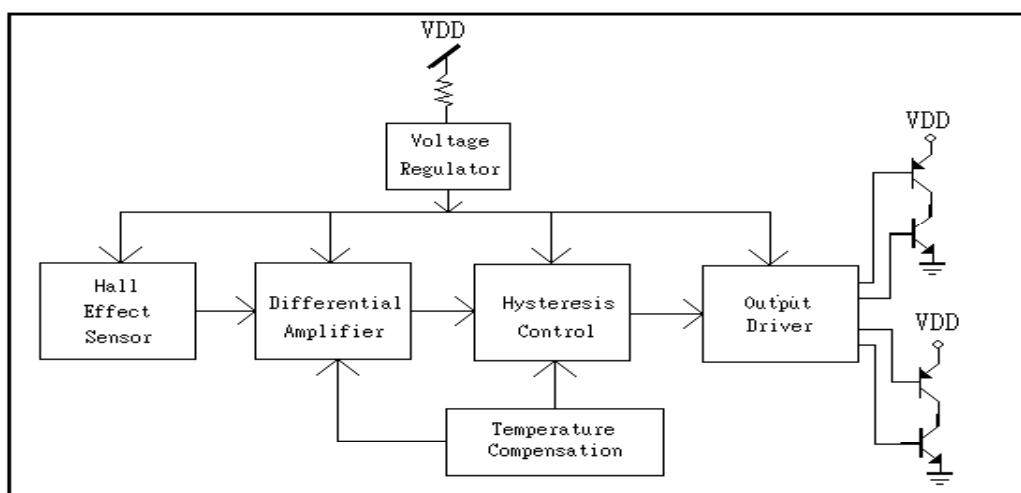
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Absolute Maximum Rating (at Ta=25° C)

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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WSH420

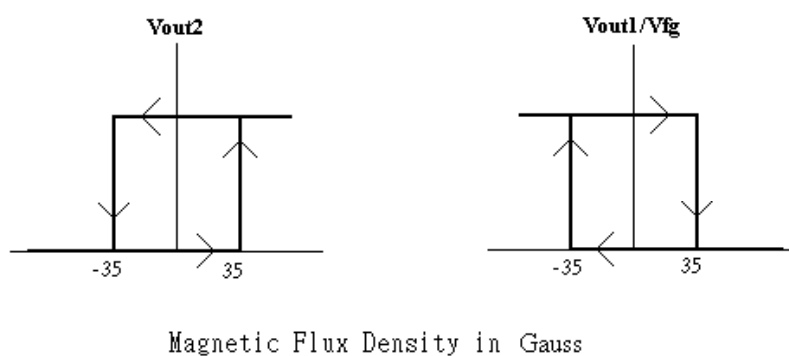
Magnetic Characteristics:

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

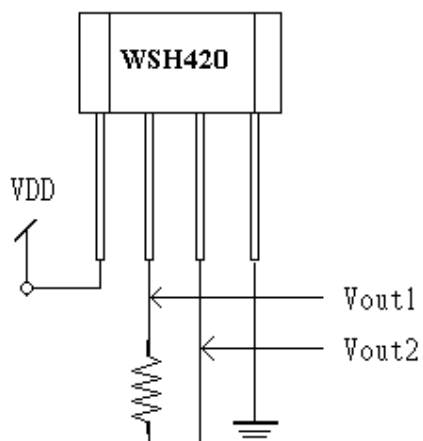
Ordering Information:

SIP -4L: WSH420-XPAN ☐	Elec. Grade
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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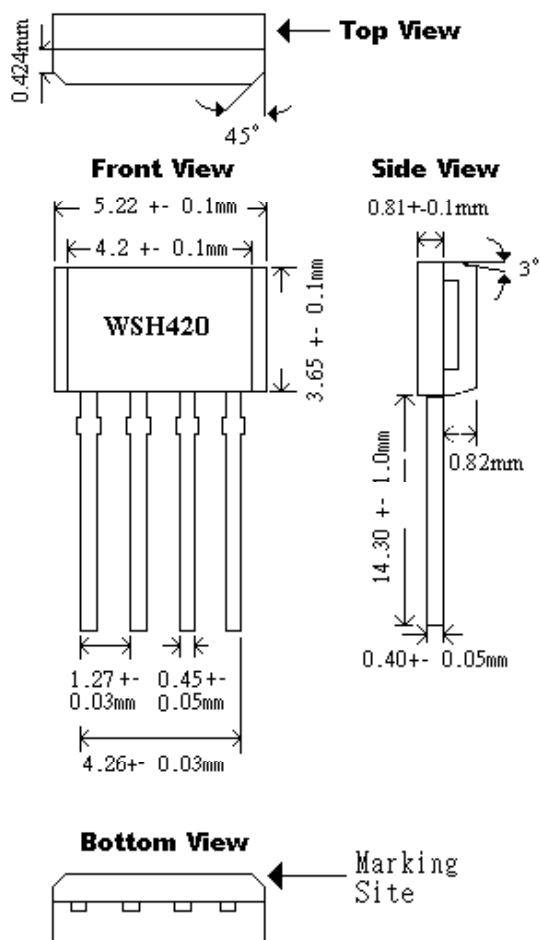
Testing Circuit

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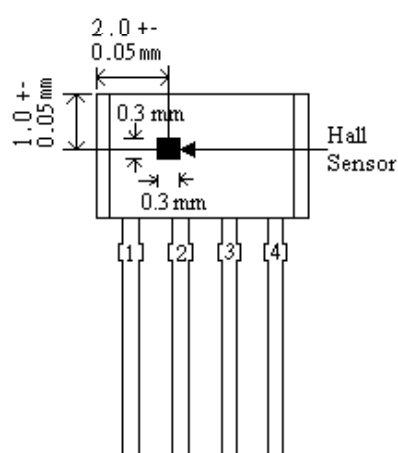
Package Information:

1. SIP-4L

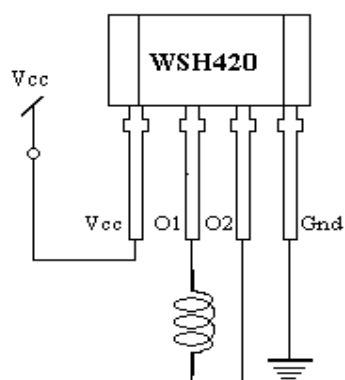
Package Dimension



Hall Sensor Location



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Application Circuit:**Figure 1.**