



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

### Features:

- Operate from 2.8V to 14V supply voltage.
- On-chip Hall sensor.
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range.
- Output sinking capability up to 350mA for driving large load.
- Lower current change rate reduces the peak output voltages during switching.
- Available in rugged low profile SIP-4L, SIP-5L and SOT-25 packages.
- Built-in Frequency Generator.
- Built-in protection diode for reverse power supply fault.
- Prevent the fail situation during lock status or high temperature
- Built-in **thermal lock protection** and **auto-restart** function.

### General Description:

WSH42FB 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 and an open-collector frequency generator capable of sinking 10mA current load. An on-chip protection diode is implemented to prevent reverse power fault. It also includes coil parts. **You can eliminate all the external components for the function of FG and reverse protection diode.** And built-in **thermal lock protection** and **auto-restart** function will automatically shutdown power at 110°C to prevent the coils be damaged during high temperature and auto-restart at 105°C. It can replace the function of lock protection and auto-restart at low cost.

WSH42FB are rated for operation over temperature range from -20° C to 90°C and voltage ranges from 2.8V to 14V.

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



**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

**Pin Descriptions: SIP-5L**

Name	P/I/O	Pin#	Description
Vcc	P	1	Positive Power Supply
DOB	O	2	Output Pin #1
DO	O	3	Output Pin #2
FG	O	4	Frequency Generator
Vss	P	5	Ground

**Pin Descriptions: (SOT-25)**

Name	P/I/O	Pin#	Description
Vcc	P	1	Positive Power Supply
Vss	P	2	Ground
FG	O	3	Frequency Generator
DO	O	4	Output Pin #2
DOB	O	5	Output Pin #1

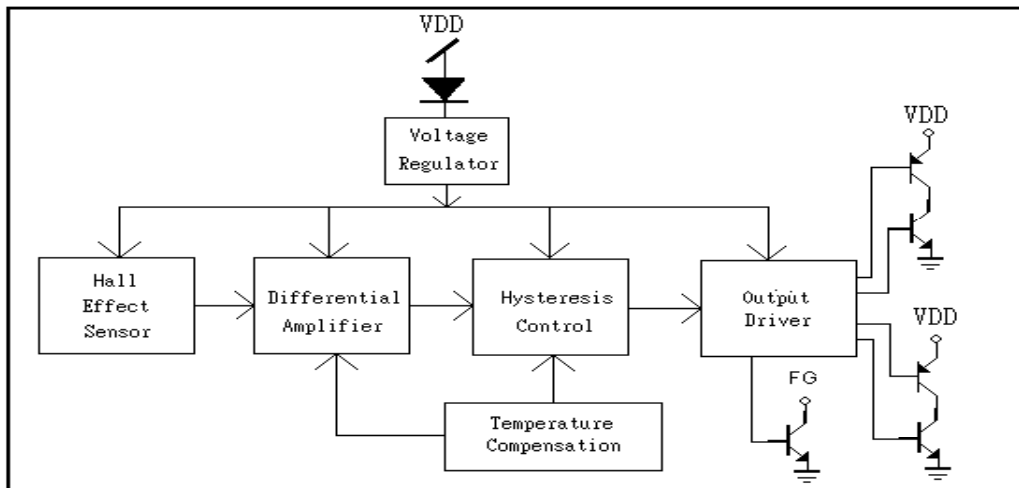
**Absolute Maximum Rating (at Ta=25° C)**

Supply Voltage	Vcc	-----	14V
FG breakdown Voltage	Vfg	-----	14V
Magnetic flux density	B	-----	Unlimited
Reverse Protection Voltage	Vr	-----	8V
Output ON Current (continuous)	Ic	-----	350mA
FG ON Current (continuous)	If	-----	10mA
Operating Temperature Range	Ta	-----	(-20°C to +90°C)
Storage Temperature Range	Ts	-----	(-65°C to +150°C)
Package Power Dissipation	Pd	-----	350mw for SOT-25 500mw for SIP-4L 500mw for SIP-5L

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**Electrical Characteristics:** (T=+25°C, Vcc=2.8V to 14V)

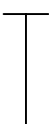
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Vcc	—	2.8	—	14	V
Output Saturation Voltage	Vout(sat) Vdrive+Vsink	Vcc=5V, Io=200mA	—	0.6	1.5	V
FG Saturation Voltage	Vfg(sat)	Vcc=5V, If=5mA B > Bop	—	0.1	0.4	V
Output Leakage Current	Ileakage	Vcc=5V, B < Brp	—	<0.1	10	uA
Supply Current	Isupply	Vcc=5V, Io=200mA FG “ON”	—	27	35	mA

**Function Block:**

**Magnetic Characteristics:**

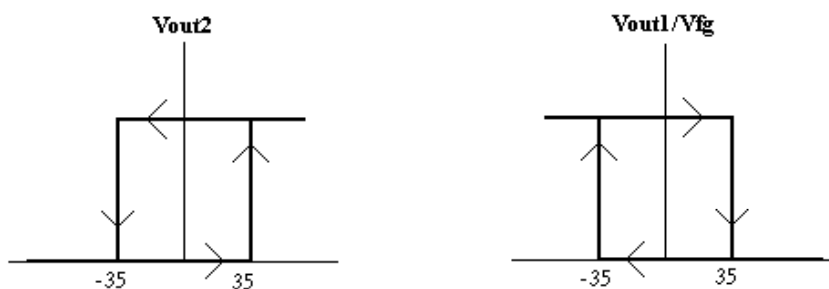
Characteristics	Symbol	Quantity	Ta= -20°C to +80°C			Unit
			Min	Typ.	Max	
Operate Point	Bop	Grade A		35	70	Gauss
		Grade B		50	100	
Release Point	Brp	Grade A	-70	-35		Gauss
		Grade B	-100	-50		
Hysteresis Window	Bop-Brp			70	150	Gauss

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**Ordering Information:**

<p>SIP -4L: WSH42FB-XPA <input type="checkbox"/></p> <p>SIP -5L: WSH42FB-XPC <input type="checkbox"/></p> <p>SOT-25: WSH42FB-XPB <input type="checkbox"/></p> <div style="text-align: center;">  <p>Elec. Grade</p> </div>	<p>Elec. Grade</p> <p><b>SIP-4L &amp; SIP-5L:</b></p> <p>1: A Grade (70 Gauss)</p> <p>2: B Grade (100 Gauss)</p> <p><b>SOT-25:</b></p> <p>1: A Grade (70 Gauss)</p> <p>2: B Grade (100 Gauss)</p>
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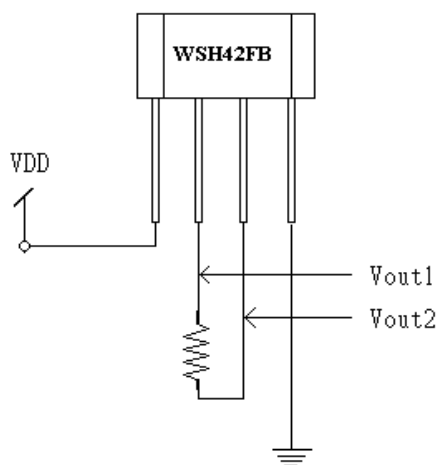
**WSH42FB Complementary Output1/Vfg vs. Output2**



Magnetic Flux Density in Gauss

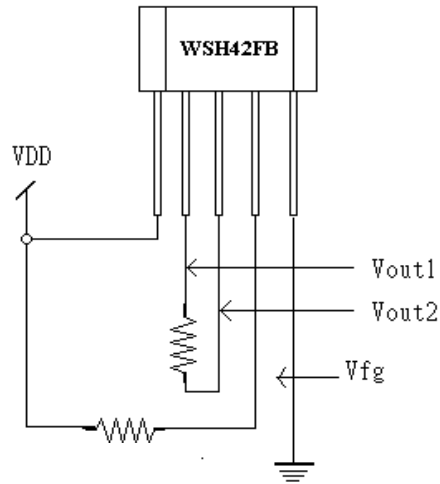
**Test Circuit:**

**1. SIP-4L**

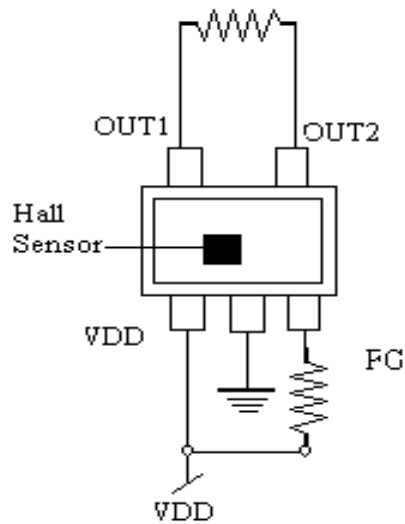


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2.SIP-5L



3. SOT-25



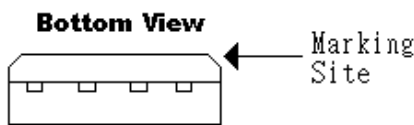
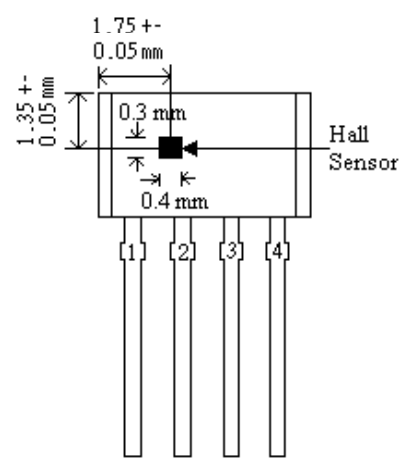
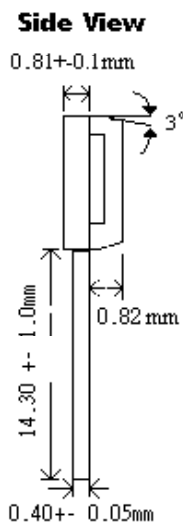
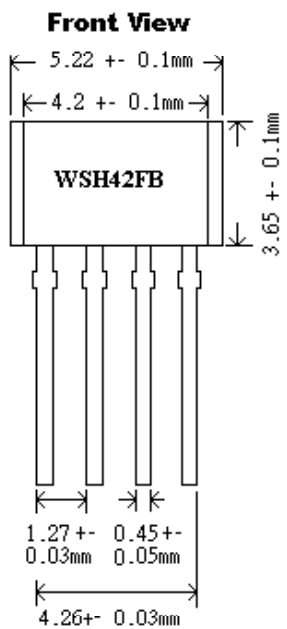
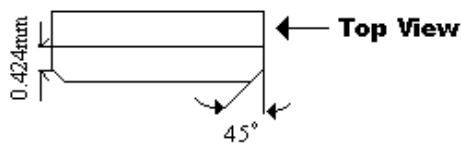
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**Package Information:**

1. SIP-4L

**Package Dimension**

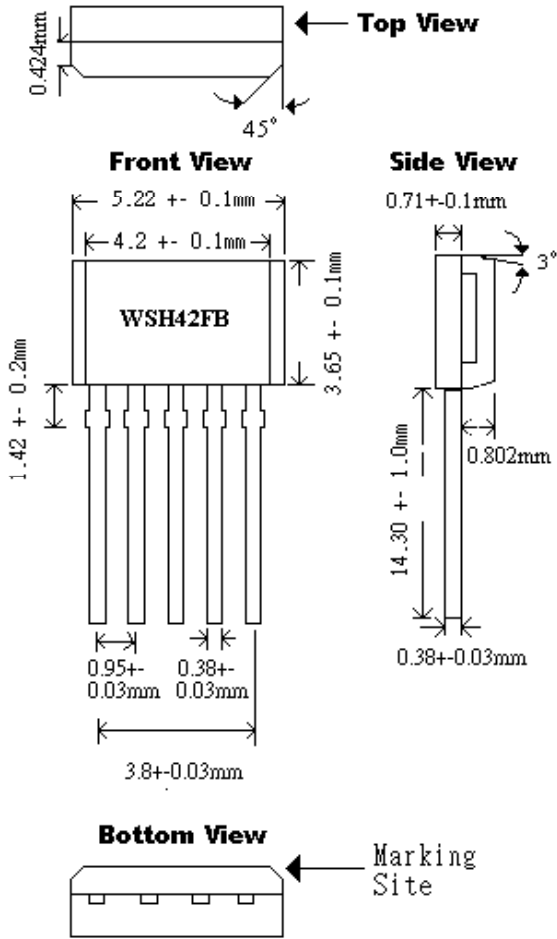
**Hall Sensor Location**



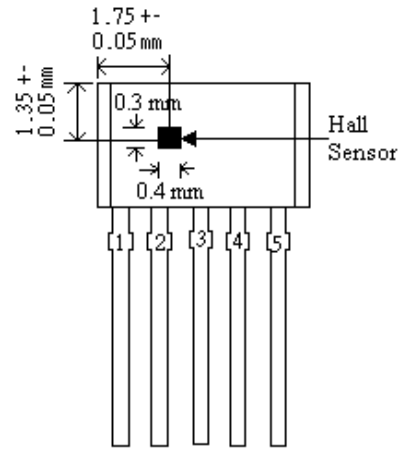
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**2. SIP-5L**

**Package Dimension**

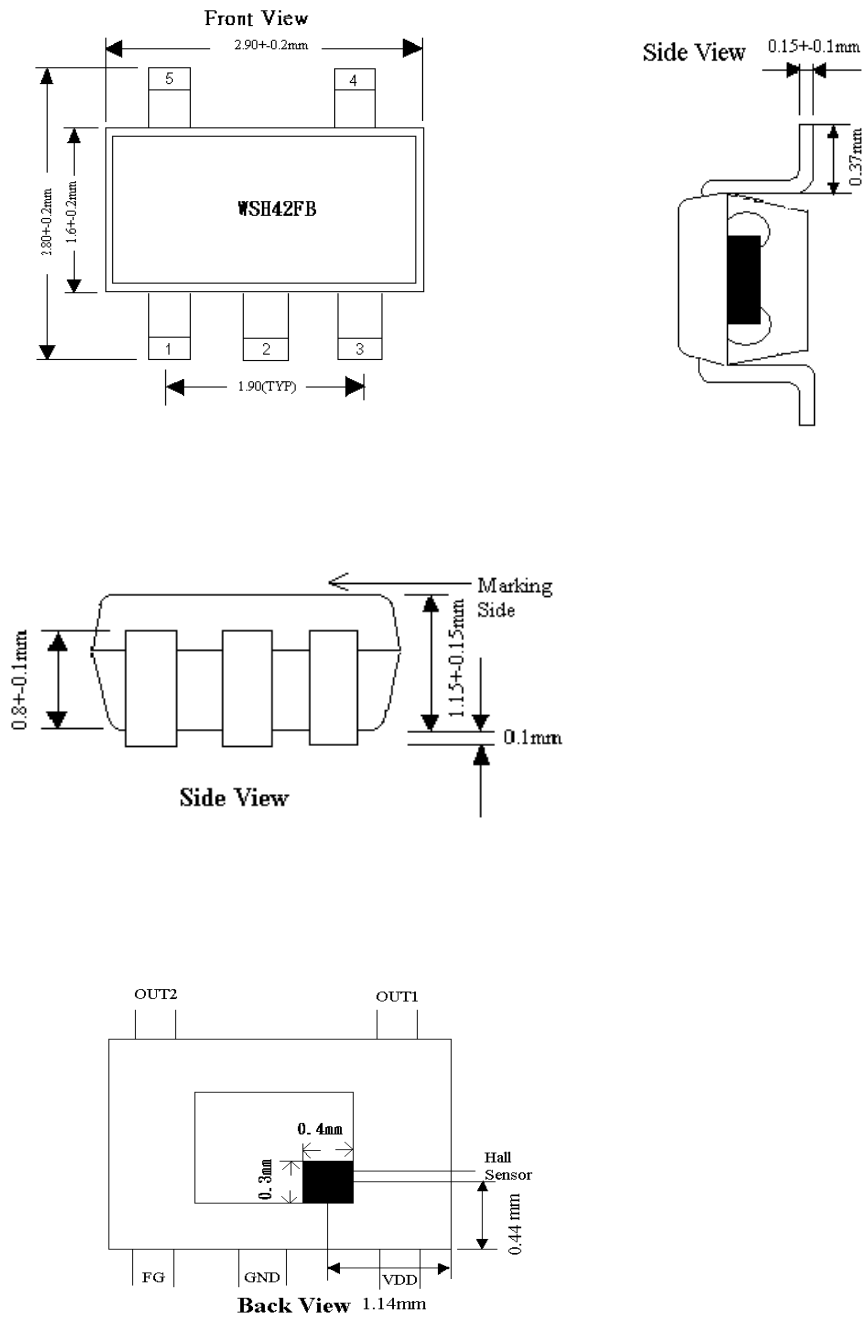


**Hall Sensor Location**



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3. SOT-25

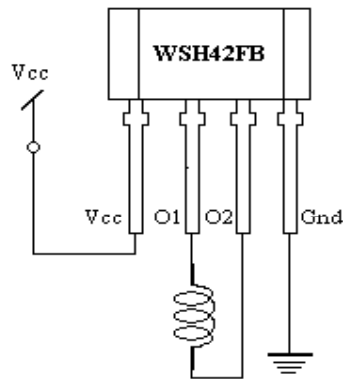


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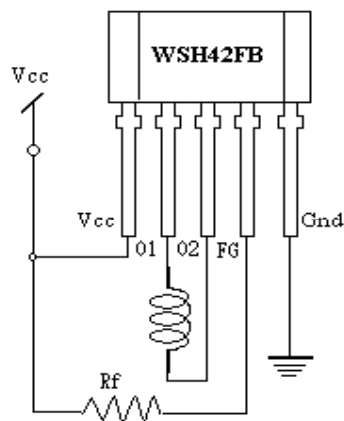
**Application Circuit:**

**1. SIP-4L**



**Figure 1.**

**2.SIP-5L**



**Figure2.**

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3-1. SOT-25

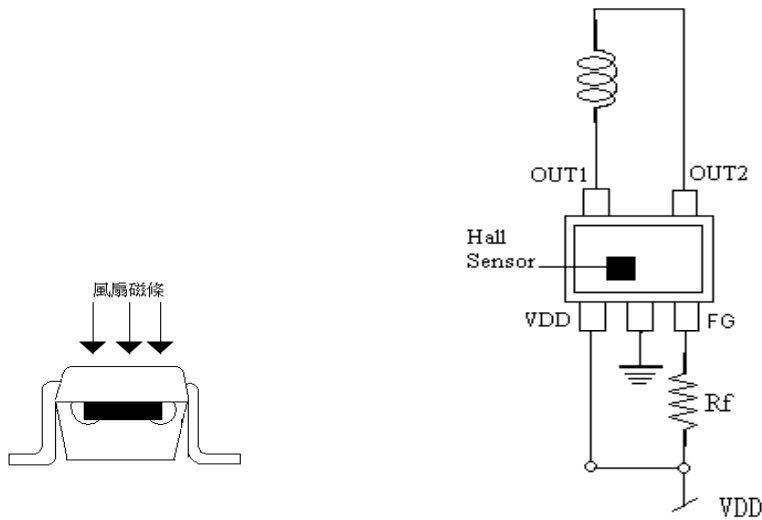


Figure 3.

3-2. SOT-25

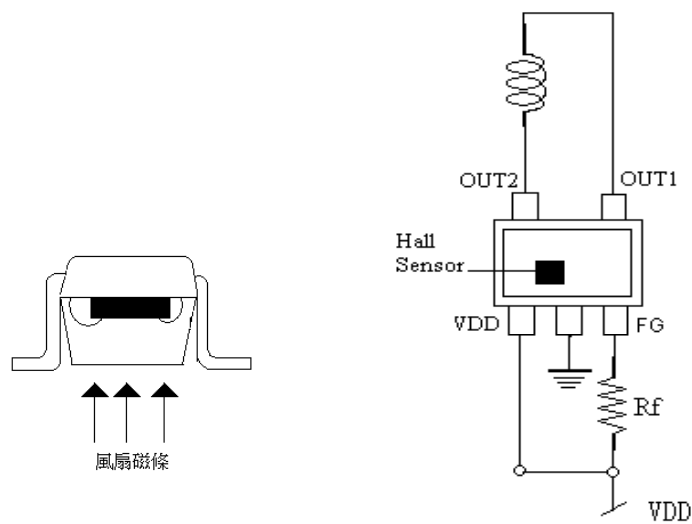


Figure 4.

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