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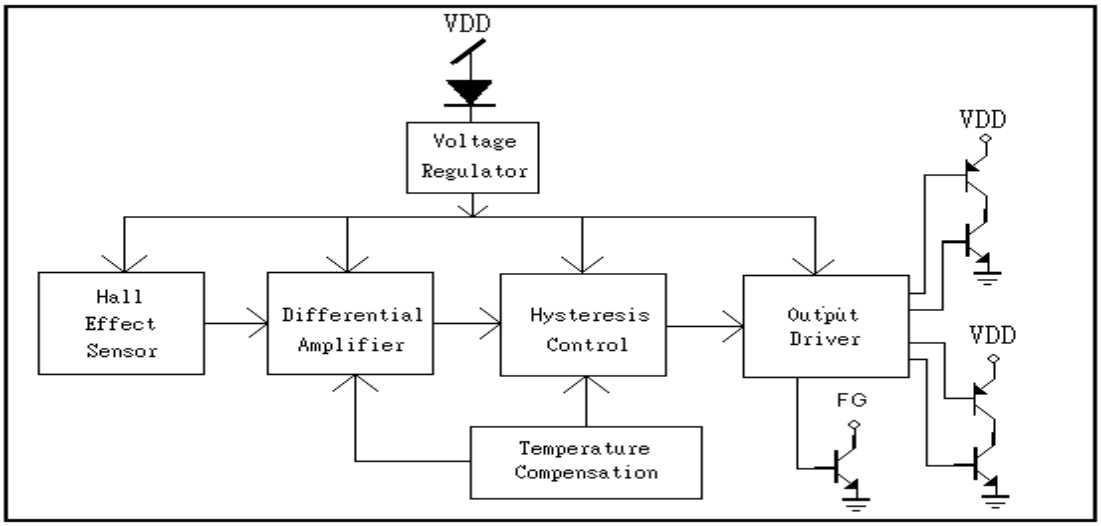
Electrical Characteristics: (T=+25˚C, Vcc=2.8V to 14V)

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 Min	Typ.	Max	Unit
Operate Point	Bop	Grade A Grade B		35 50	70 100	Gauss
Release Point	Brp	Grade A Grade B	-70 -100	-35 -50		Gauss
Hysteresis Window	Bop-Brp			70	150	Gauss

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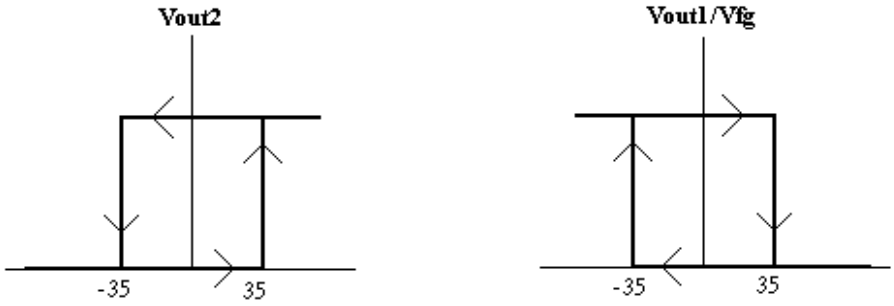
Ordering Information:

SIP -4L: WSH42FB-XPA□ **SIP -5L:** WSH42FB-XPC□ **SOT-25:** WSH42FB-XPD□ Elec. Grade	Elec. Grade **SIP-4L & SIP-5L:** **1**: A Grade (70 Gauss) **2**: B Grade (100 Gauss) **SOT-25:** **1**: A Grade (70 Gauss) **2**: B Grade (100 Gauss)

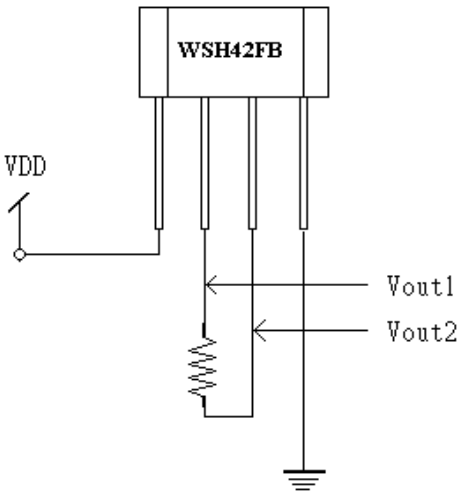
WSH42FB Complementary Output1/Vfg vs.Output2



Magnetic Flux Density in Gauss

Test Circuit:

1. SIP-4L



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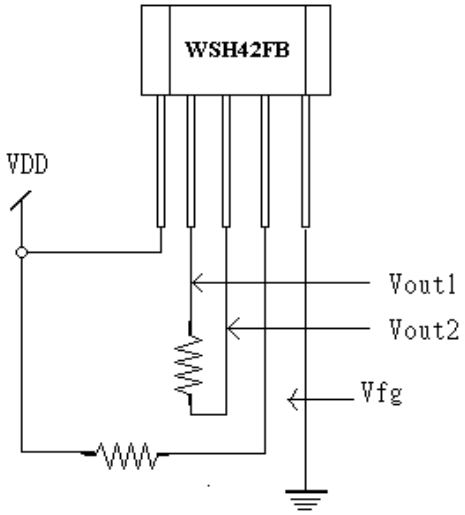
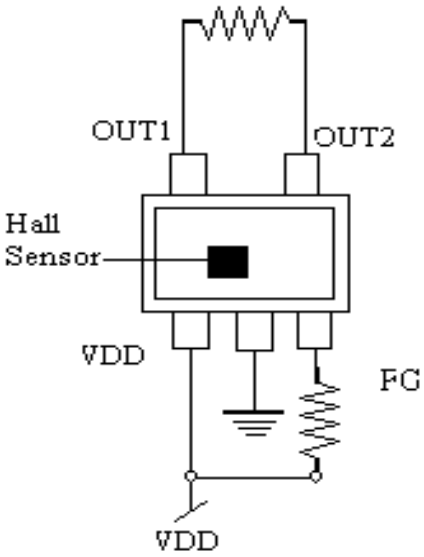
2.SIP-5L



3. SOT-25



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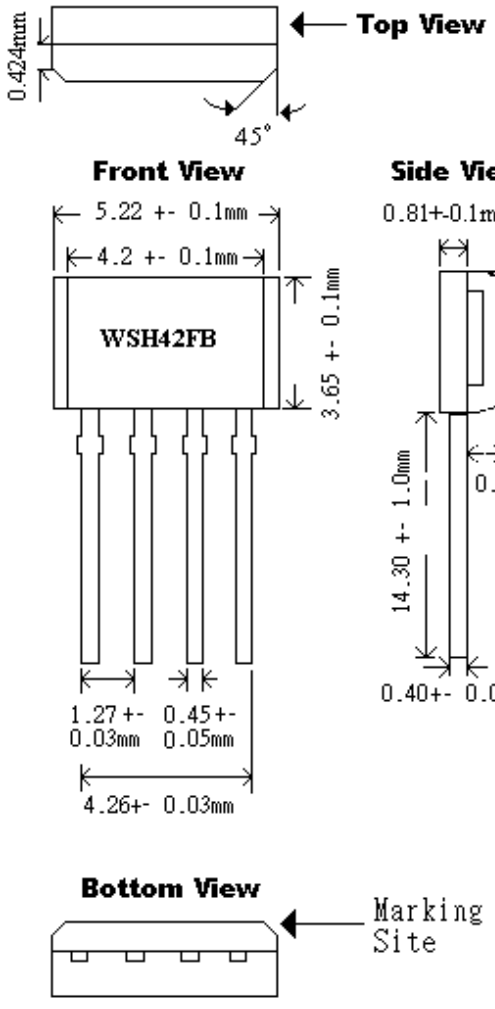
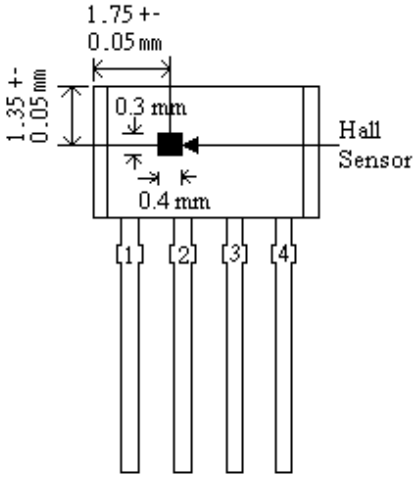
Package Information:

1. SIP-4L

Package Dimension



Hall Sensor Location



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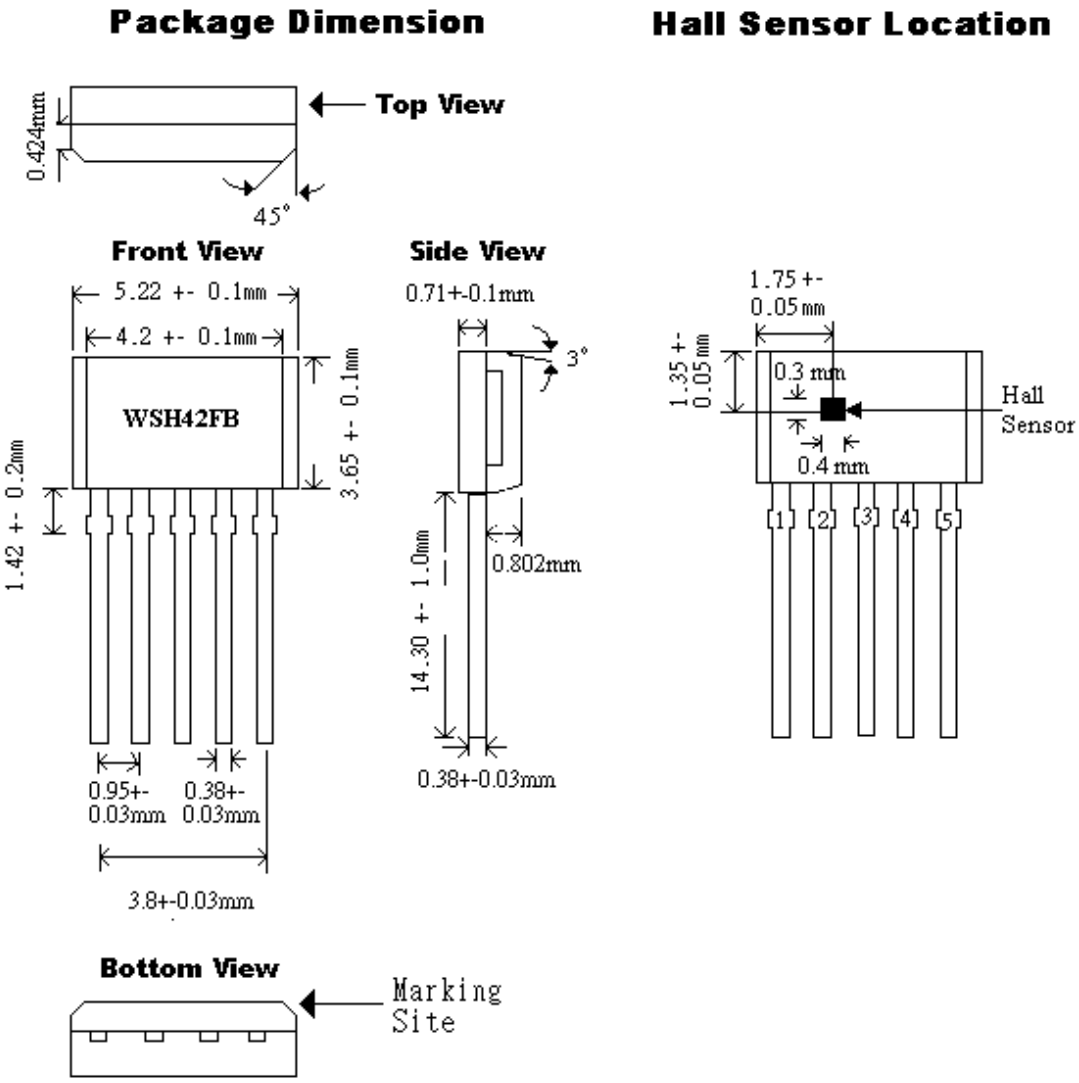
2. SIP-5L



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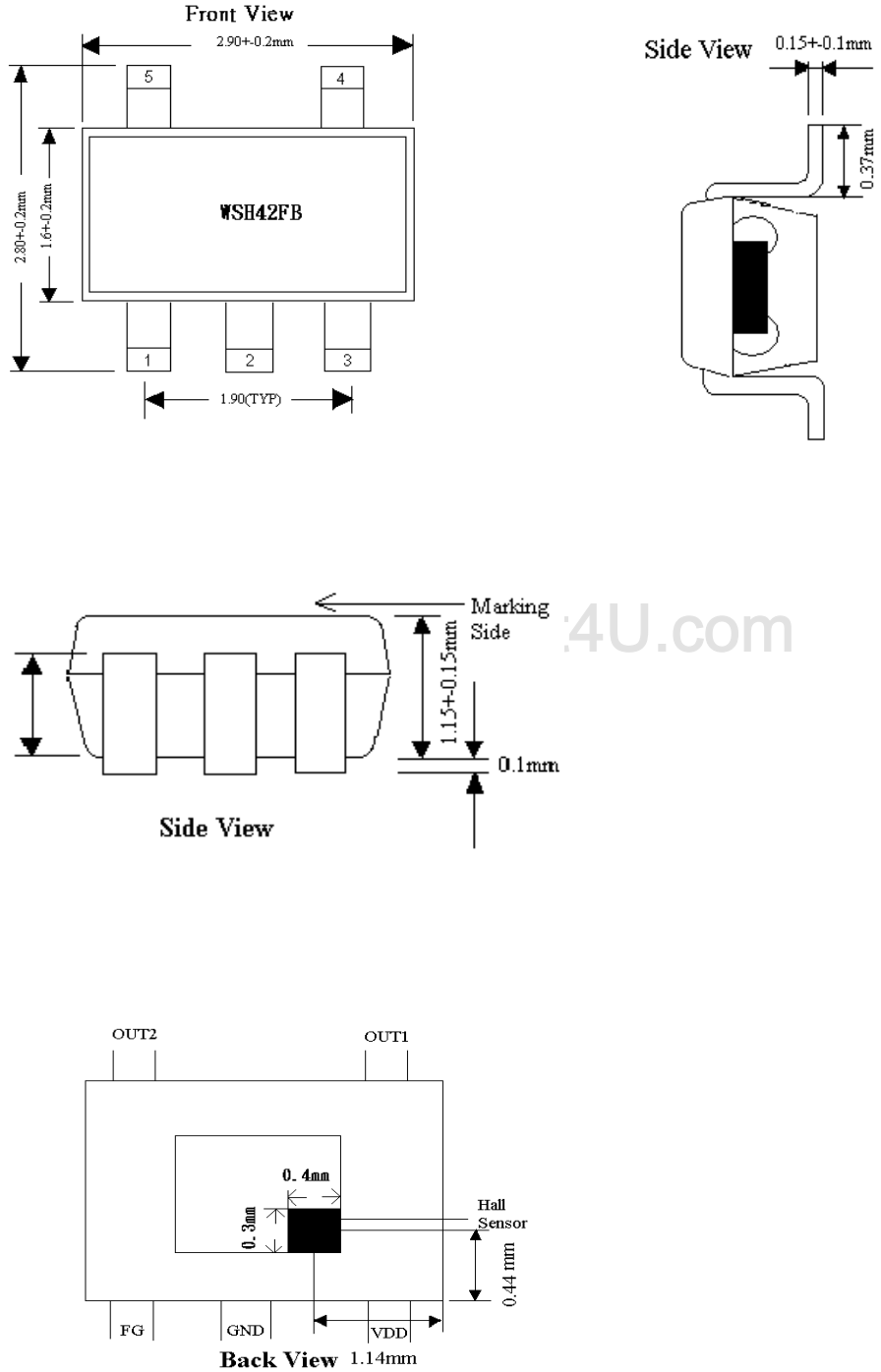
3. SOT-25



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Application Circuit:

1. SIP-4L

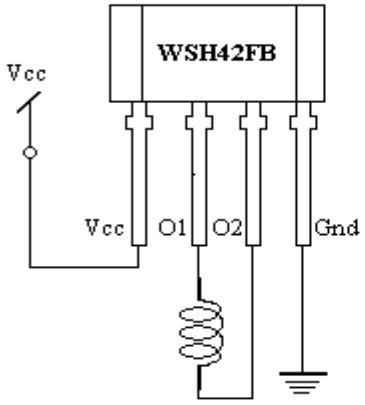

Figure 1.

2.SIP-5L

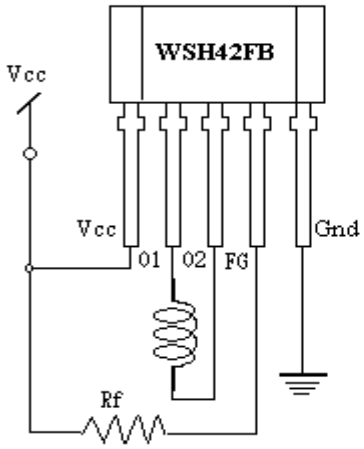

Figure2.

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3-1. SOT-25

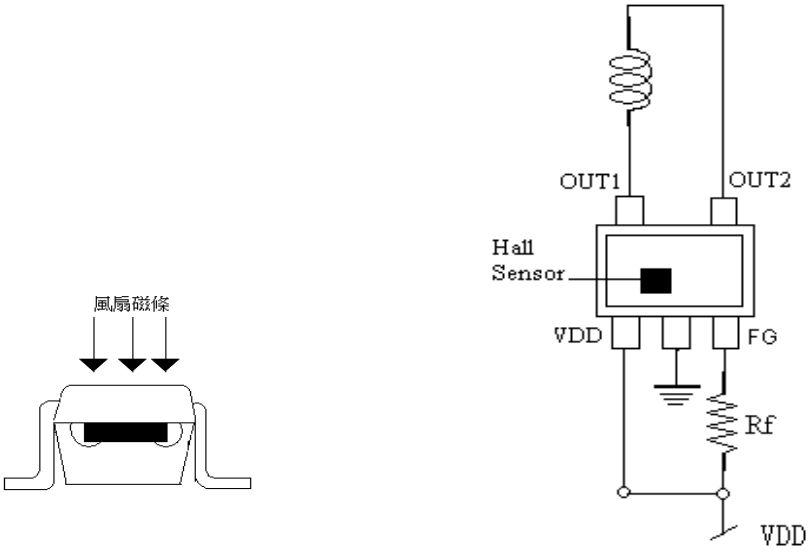

Figure 3.

3-2. SOT-25

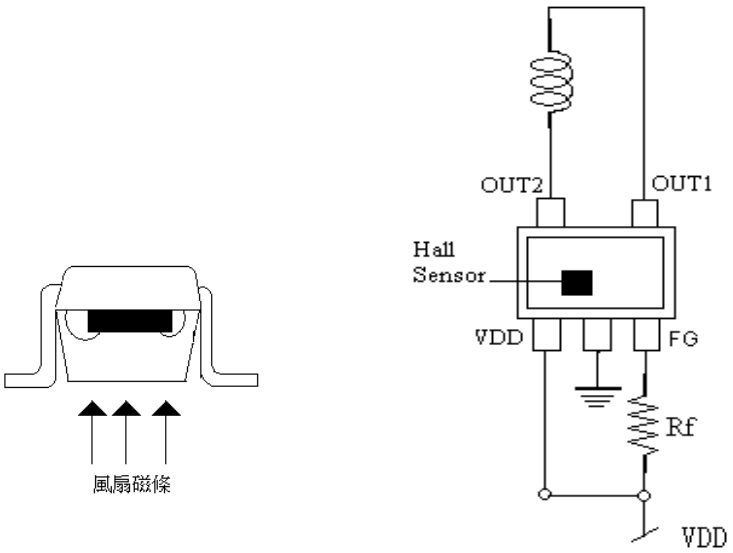

Figure 4.

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