

Hall Effect Sensor IC with Thermal Lock Protection and Auto Restart Function

Features:

- Operate from 2.8V to 20V supply voltage.
- On-chip Hall sensor.
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range.
- High output sinking capability up to 600mA for driving large load.
- Lower current change rate reduces the peak output voltages during switching.
- Available in rugged low profile SOT-25 , SIP-4L packages.
- Built-in FG output.
- Built-in protection diode for reverse power supply fault.
- Built-in thermal lock protection and auto-restart function.

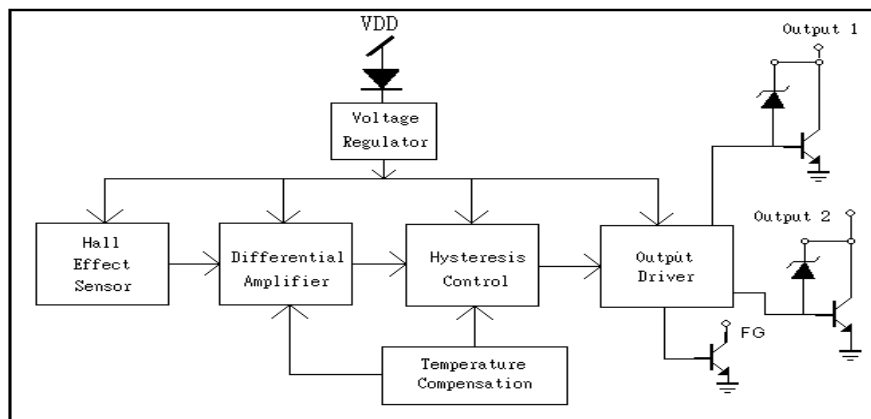
General Description:

WSH412 is designed to integrate Hall sensor with complementary output drivers and frequency generator together on the same chip, it is suitable for speed measurement, revolution counting, positioning, and DC brushless motors. It includes a temperature compensated voltage regulator, a differential amplifier, a Hysteresis controller, two open-collector output drivers capable of sinking 600mA 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. And built-in thermal lock protection and auto-restart function is suitable for super high speed fan. It can replace the function of lock protection and auto restart function. The power will be shutdown automatically at 130°C to prevent the coils be damaged and auto-restart after cooling down.

The temperature-dependent bias increases the supply voltage of the hall plates and adjusts the switching points to the decreasing induction of magnets at higher temperatures. Subsequently, the open collector output switches to the appropriate state. WSH412 are rated for operation over temperature range from -20° C to 100°C and voltage ranges from 2.8V to 20V.

Current						
Supply Current	I _{supply}	V _{cc} =20V, Output & FG Open	—	20	30	mA
Output / FG Rising Time	T _r	V _{cc} =12V, R _L =820Ω C _L =20Pf	—	3.0	10	us
Output / FG Falling Time	T _f	V _{cc} =12V, R _L =820Ω C _L =20Pf	—	0.3	1.5	us
Output / FG Time Differential	Δt	V _{cc} =12V, R _L =820Ω C _L =20Pf	—	0.3	3	us

Function Block:

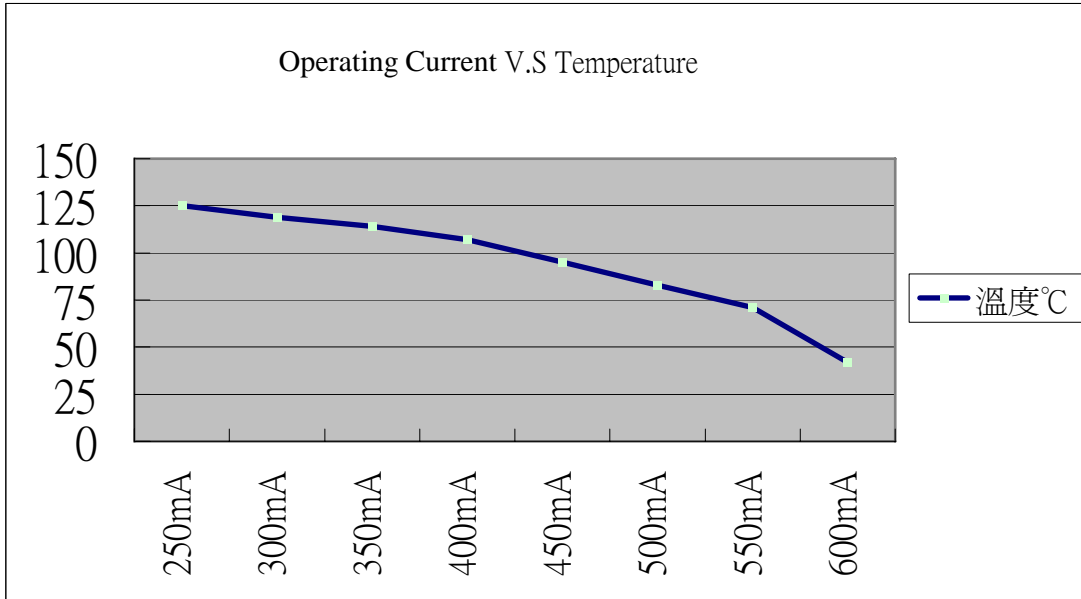


Magnetic Characteristics:

Characteristics	Symbol	Quantity	T _a = -20°C to +100°C			Unit
			Min	Typ.	Max	
Operate Point	B _{op}	Grade A		25	50	Gauss
		Grade B		30	70	
		Grade C		50	120	
Release Point	B _{rp}	Grade A	-50	-25		Gauss
		Grade B	-70	-30		
		Grade C	-120	-50		
Hysteresis Window	B _{op} -B _{rp}			40	200	Gauss

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

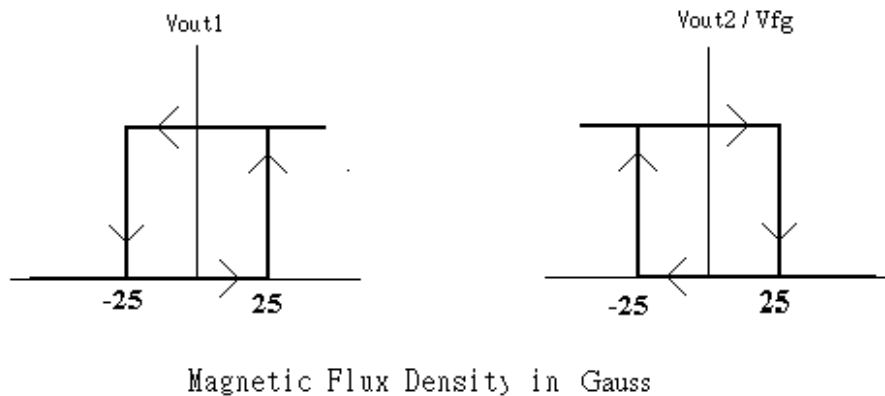
Operating Current vs. Thermal Protection temperature



Ordering Information:

<p>SIP- 4L: WSH412-XPAN <input type="checkbox"/></p> <p>SOT-25: WSH412-XPDN <input type="checkbox"/></p> <p style="text-align: center;">┌ └ Elec. Grade</p> <p>N: Non-lead Process</p>	<p>Elec. Grade</p> <p>SIP-4L</p> <p>1: A Grade (50 Gauss)</p> <p>2: B Grade (70 Gauss)</p> <p>3: C Grade (120 Gauss)</p> <p>SOT-25:</p> <p>1: A Grade (50 Gauss)</p> <p>2: B Grade (70 Gauss)</p>
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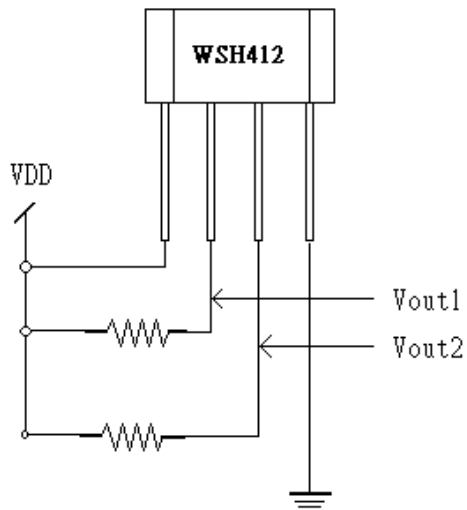
WSH412 Complementary Output1 vs. Output2/Vfg



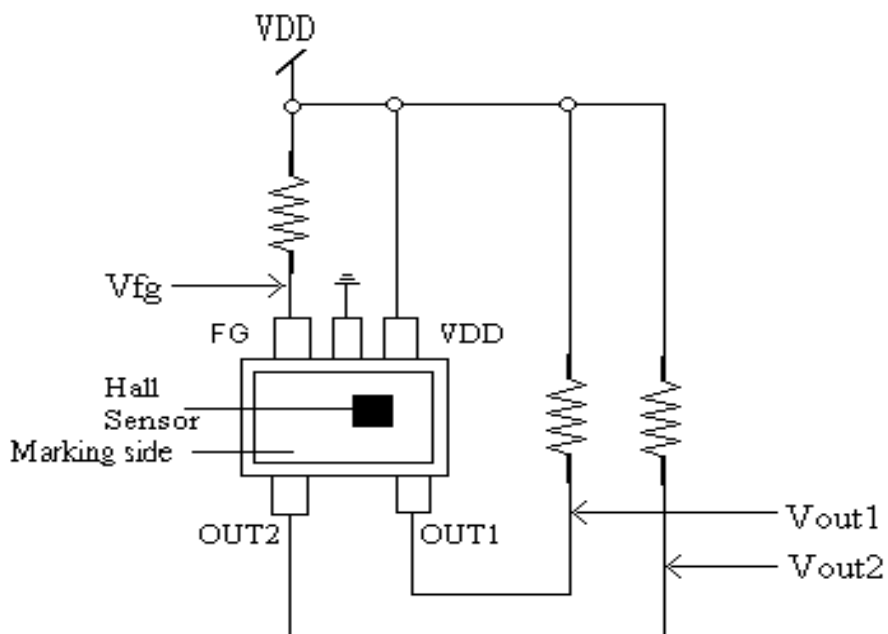
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Test Circuit:

SIP-4L



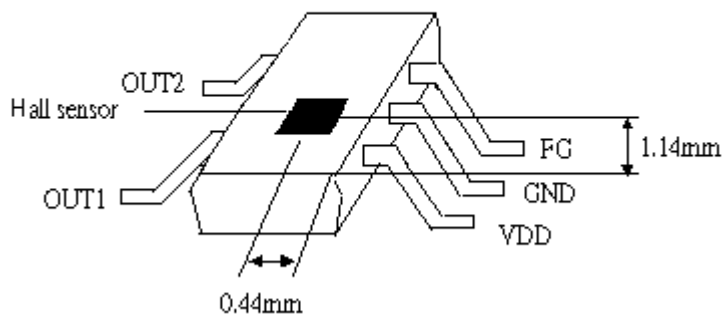
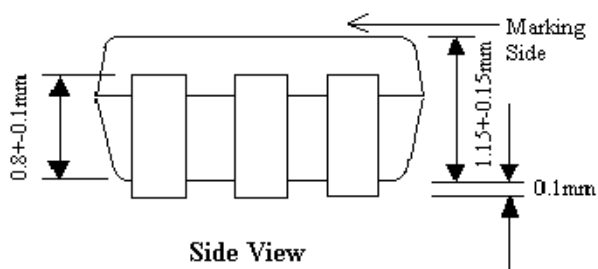
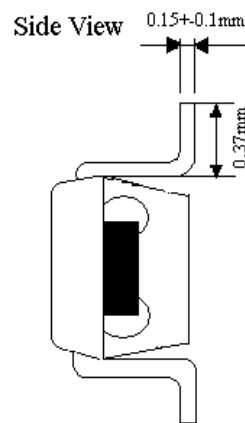
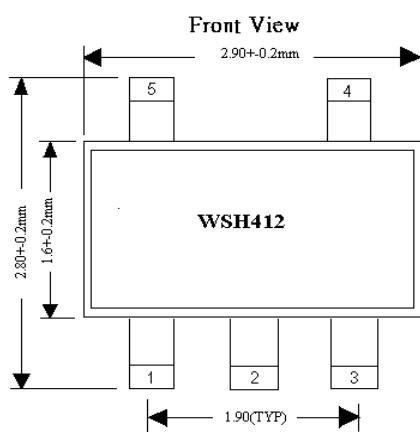
SOT-25



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Package Information:

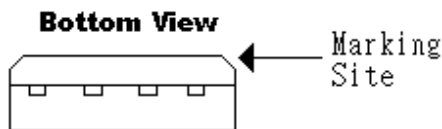
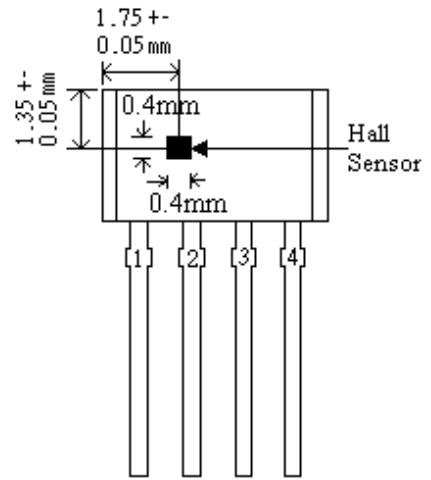
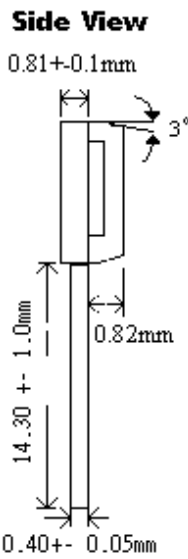
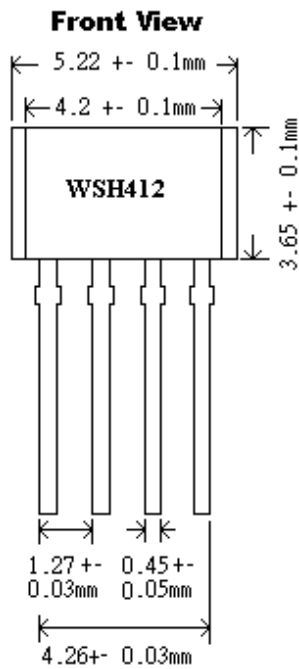
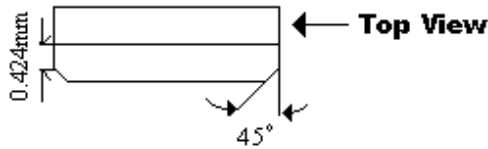
SOT-25



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Package Dimension

Hall Sensor Location



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Application Circuit:

SOT-25

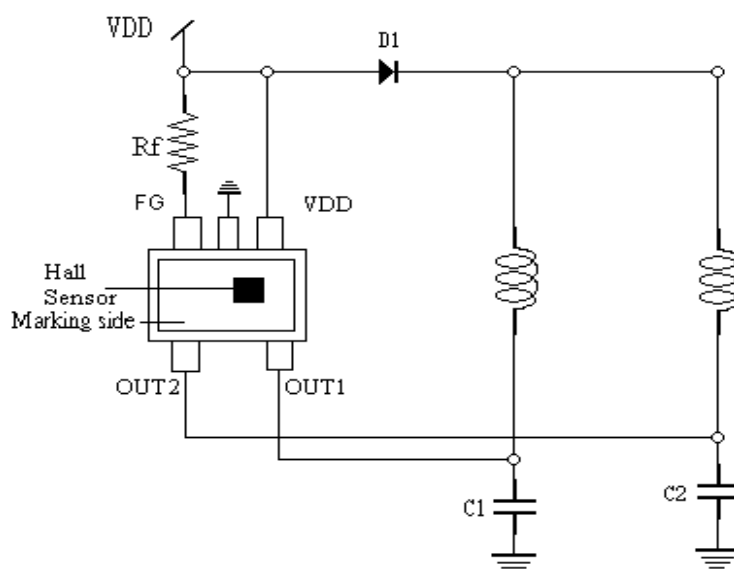


Figure 1.

SIP-4L

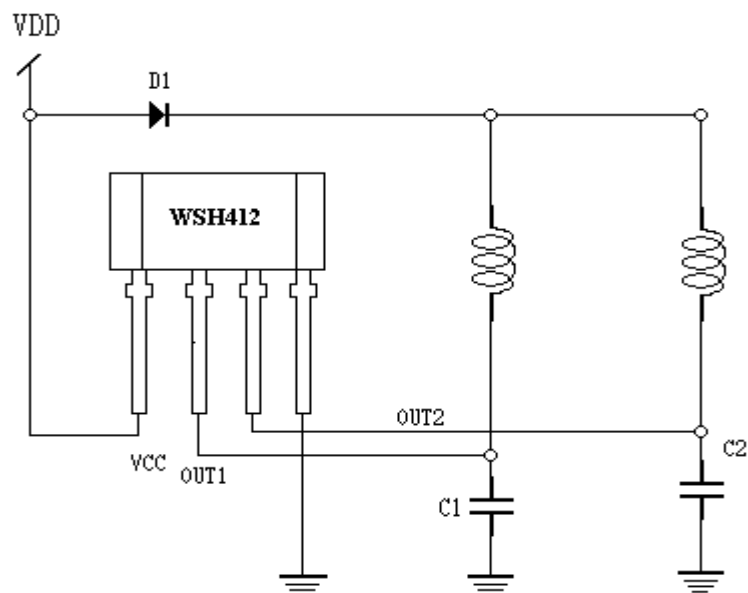


Figure 2.

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