

Description

The SH41F is an integrated Hall-effect latched sensor designed for electronic commutation of brushless DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt to provide switching hysteresis for noise rejection and open-collector output. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. A north pole of sufficient strength will turn the output ON. In the absence of a magnetic field, the output is OFF. This IC is available in TO-92S-3 and SOT-23-3 package.

Features

- On-chip Hall Sensor
- Wide Operating Voltage Range: 3.8V to 30V
- Internal Bandgap Regulator for Temperature Compensation
- Maximum Output Sink Current: 50mA
- Low Profile TO-92S-3
- Operating Temperature: -40°C to 150°C
- ESD Rating: 3000V (Human Body Model) 300V (Machine Model)

Application

- Brushless DC Motor



Figure 1. Package Type of SH41F

Pin Configuration

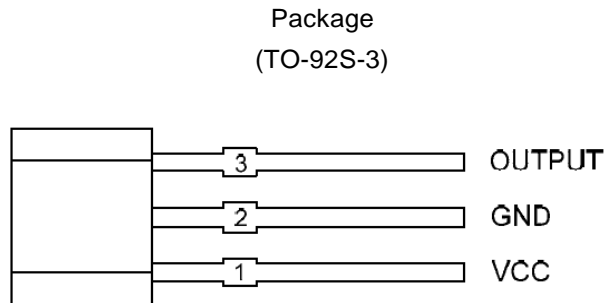


Figure 2. Pin Configuration of SH41F (Front View)

Pin Description

Pin Number	Pin Name	Function
1	VCC	Power
2	GND	Ground
3	OUTPUT	Output

Functional Block Diagram

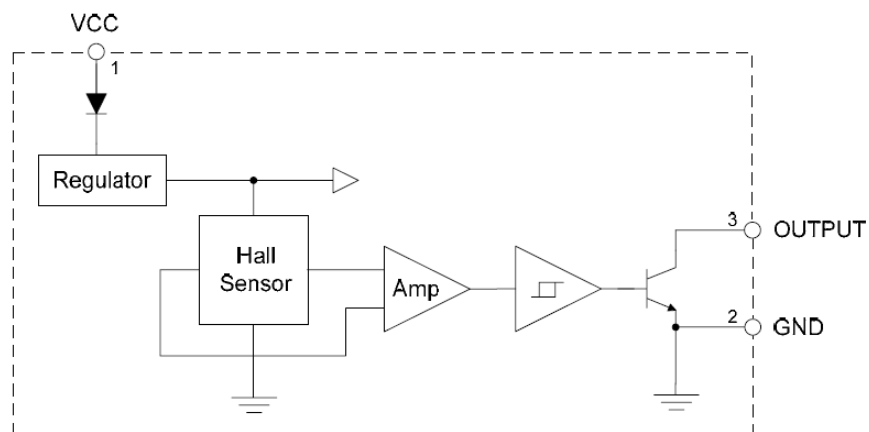


Figure 3. Functional Block Diagram of SH41F

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	-30 to 30	V
Output Off Voltage	V _{CE}	30	V
Output Sink Current (Continuous Current)	I _{OUT}	40	mA
Power Dissipation	PD	400	mW
Storage Temperature	T _S	-55 to 150	°C
Junction Temperature	T _J	150	°C
ESD (Machine Model)	ESD	300	V
ESD (Human Body Model)	ESD	3000	V

Note 1: Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

Recommended Operating Conditions (TA=25°C)

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{CC}	3.8	30	V
Operating Temperature	T _{OP}	-40	150	°C

Electrical Characteristics

V_{CC} =12V, T_A =25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Type	Max	Unit
Supply Voltage	V _{CC}	Operating	3.8		30	V
Supply Current	I _{CC}	Awake		5	9	mA
Output Leakage Current	I _{LEAK}	B< BRP		<0.1	10	μA
Output Saturation Voltage	V _{SAT}	I _{OUT} =1.0mA		110	300	mV
Rise Time	t _r	Operating		200		μs
Fall Time	t _f	Operating		100		ms

Magnetic Characteristics (TA=25°C)

Parameter	Symbol	Min	Type	Max	Unit
Operating point	B _{OP}	10	40	70	Gauss
Releasing Point	B _{RP}	-70	-40	-10	Gauss
Hysteresis	B _{HYS}		80		Gauss

Typical Performance Characteristics

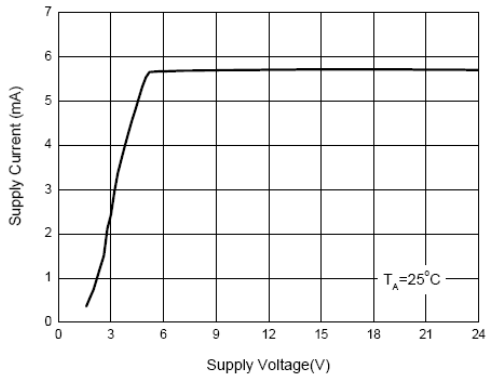


Figure 5. Supply Current vs. Supply Voltage

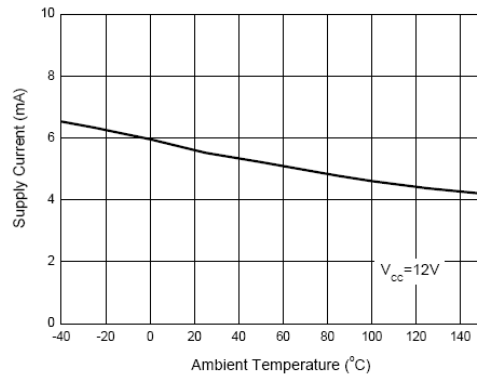


Figure 6. Supply Current vs. Ambient Temperature

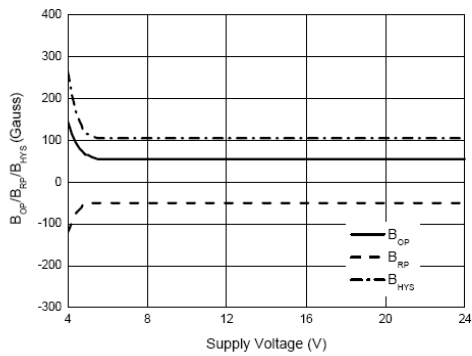


Figure 7. B_{OP}/B_{RP}/B_{HYS} vs. Supply Voltage

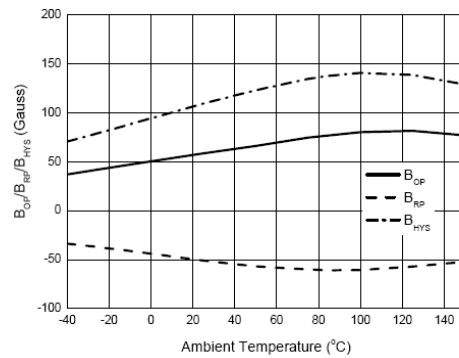


Figure 8. B_{OP}/B_{RP}/B_{HYS} vs. Ambient Temperature

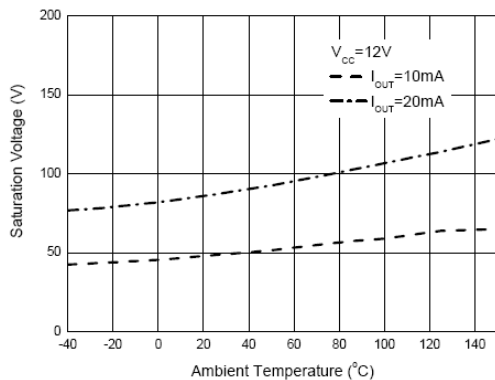
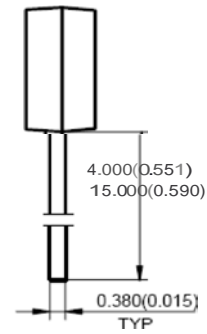
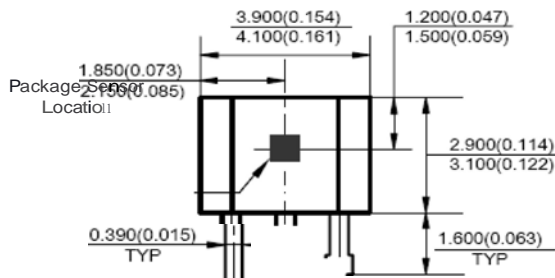
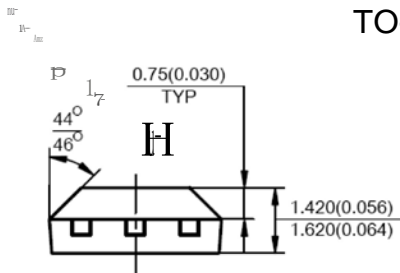


Figure 9. Saturation Voltage vs. Ambient Temperature

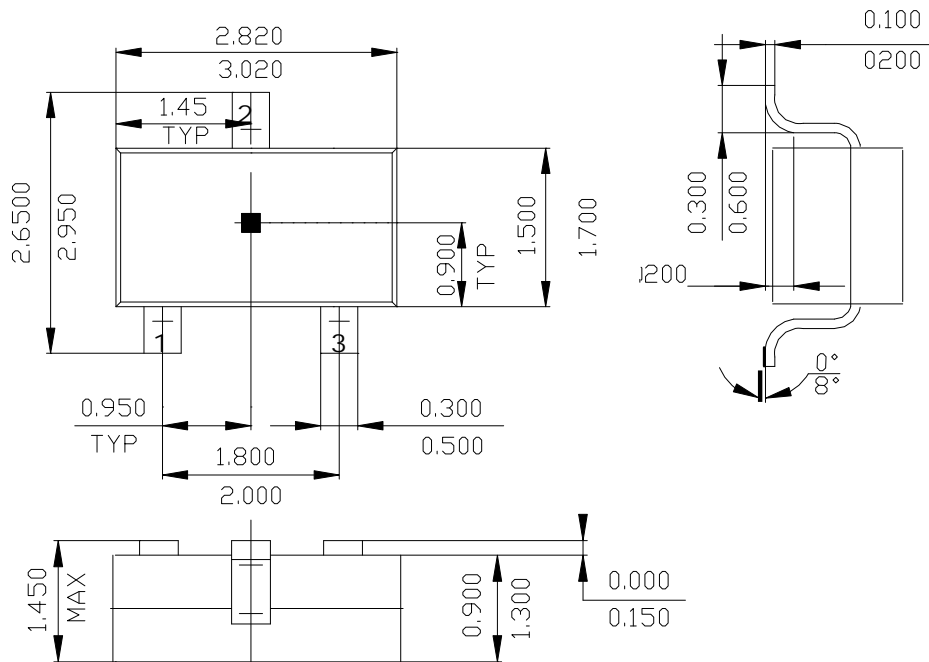
Package Dimensions

TO-92S-3

Unit: mm(inch)



2、SOT-23



PIN NOTES : 1.VCC 2.Ground 3.Output

NOTE:

- u □Mechanical Stress Should be lessened as far as possible in the process of assembly
- u □The soldering temperature at the leads should be less than 260°C with 5 seconds.