GH141F

Bipolar Hall Effect Position Sensor For High Temperature

◆ General Description

The GH141F is an integrated Hall Effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifiers 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.

In the absence of a magnetic field, the output pin is “OFF” (High). A north pole of sufficient strength will turn the output “ON” (Low). While the magnetic flux density (B) is larger than threshold Bop, the output pin is “ON”. If B removed toward Brp, the output pin is latched “ON” state prior to B < Brp. When B < Brp, the output pin goes into “OFF” state.

◆ Features

- Bipolar Hall Effect Latch Sensor
- Wide operating voltage range: 3.8V~30V
- Open Collector Pre-Driver
- Maximum output sink current: 40mA
- Chip Power Reverse-Connection Protection
- Operating Temperature: -40℃~+150℃
- Package: SIP3L (TO-92S)

◆ Applications

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection
- Brush-less DC Motor
- Brush-less DC Fan
- Revolution counting
- Speed measurement

◆ Typical Application

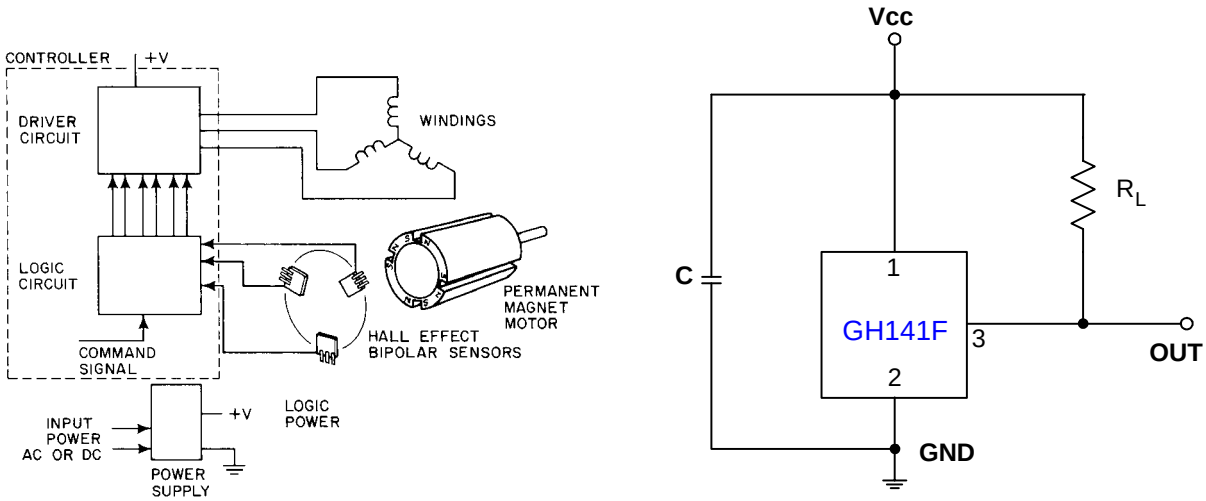


Fig.1 Typical Application of GH141F in Brush-less DC Motor.

◆ Absolute Maximum Rating (Note 1)

SYMBOL	PARAMETER	RATING
VCC	Supply Voltage	-30V to +40VDC
Vout (off)	Voltage externally applied to output	+40VDC max, OFF condition only -0.5 V min., OFF or ON condition
Io (sink)	Output "ON" Current	40 mA
PD	Power Dissipation	450 mW
Top	Operation Temperature Range	-40 to +150 ℃
Tst	Storage Temperature Range	-65 to +150 ℃
B	Magnetic Flux	No limit.

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

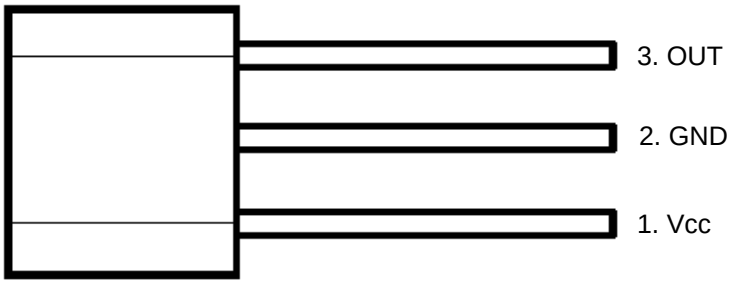
◆ Pin Description

PIN #	NAME	P/I/O	FUNCTION DESCRIPTION
1	VCC	P	Input Power Supply
2	GND	P	Ground
3	OUT	O	Output Stage of Open Collector

◆ Pin Configuration

SIP3L

(Top View)



◆ Functional Block Diagram

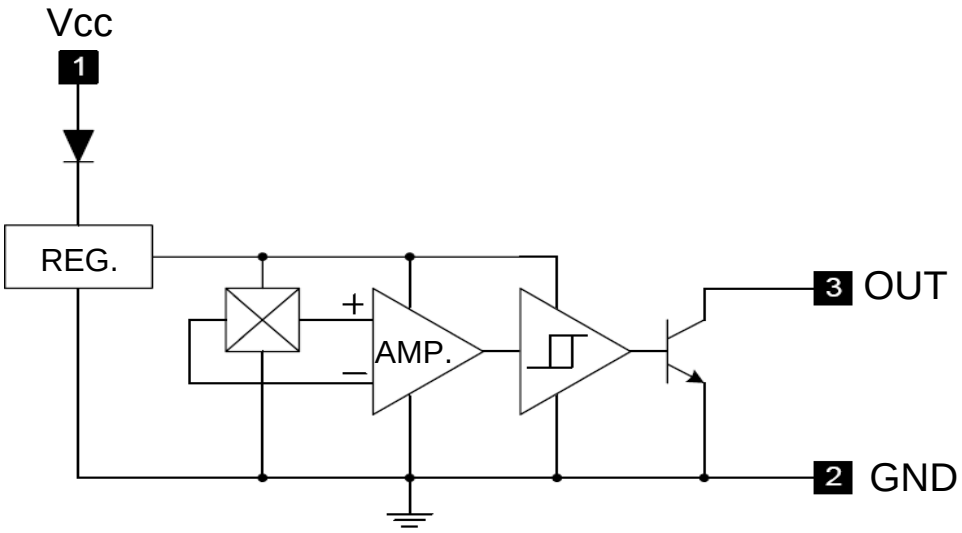


Figure 2. Function Block Diagram of GH141F

◆ Electrical Characteristics (TA = 25℃)

SYMBOL	PARAMETER		CONDITIONS	MIN.	TYP.	MAX.	UNIT
Vcc	Supply Voltage		Operating	3.8		30	V
$V_{O\ (SAT)}$	Output Saturation Voltage		Vcc = 12V, OUT "ON", Io = 25mA	100		250	mV
			Vcc = 12V, OUT "ON", Io = 40mA	250		600	mV
Icc	Supply Current		Vcc = 4V~28V, OUT "OFF"		3.2	7.5	mA
I_{LE}	Output Leakage Current (Leakage into sensor output)		Released			10	μA
Tr	Output Switching Time	Rise Time	RL=820Ω, CL=20pF		0.2		μS
Tf		Fall Time	RL=820Ω, CL=20pF		0.5		μS

◆ Test Circuit

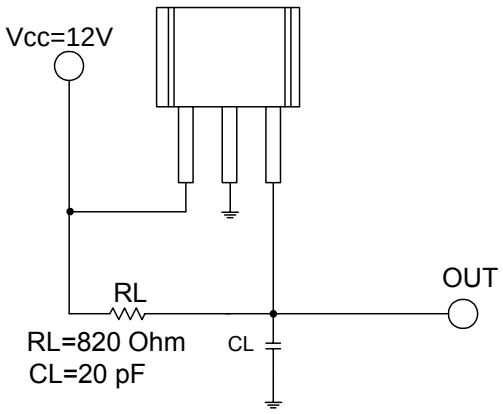


Fig 3. Test Circuit

◆ Magnetic Characteristics (TA = 25℃, VCC = 12V)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
Bop	Operation Point		-	120	Gauss
Brp	Release Point	-120	-		Gauss
Bhy	Hysteresis		80		Gauss

◆ Operating Characteristics

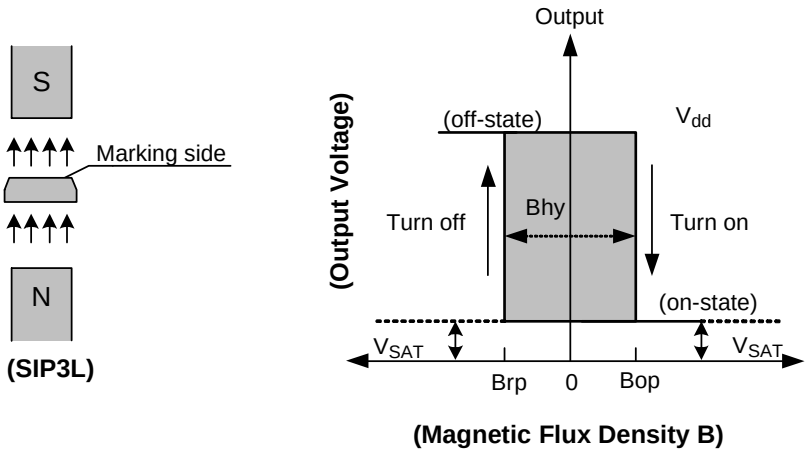
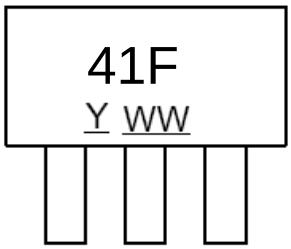


Figure 4. Operating Characteristics of GH141F

◆ Marking Information

SIP-3L

(Top View)

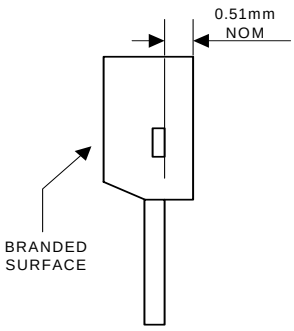


Y : Year : "8" = 2008

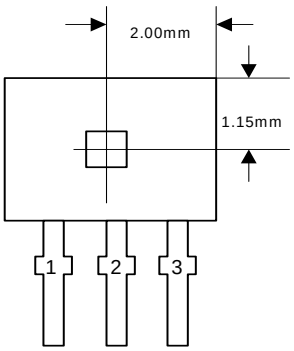
WW : Nth Week 01~52

◆ Package Information (unit: mm)

Package Type: SIP-3L for Bulk pack



Active Area Depth



Sensor Location

Package Dimension