

Description

This Hall-effect switch is monolithic integrated circuits with tighter magnetic specifications, designed to operate continuously over extended temperatures to +150°, and is more stable with both temperature and supply voltage changes. The negative compensation slope is optimized to match the negative temperature coefficient of low cost magnets.

Band gap regulation provides extremely stable operation over 3.5 to 60 VDC supply voltage range. DH851 is capable of continuous 60 mA sinking output, and may be cycled as high as 60 mA maximum.

Features and Benefits

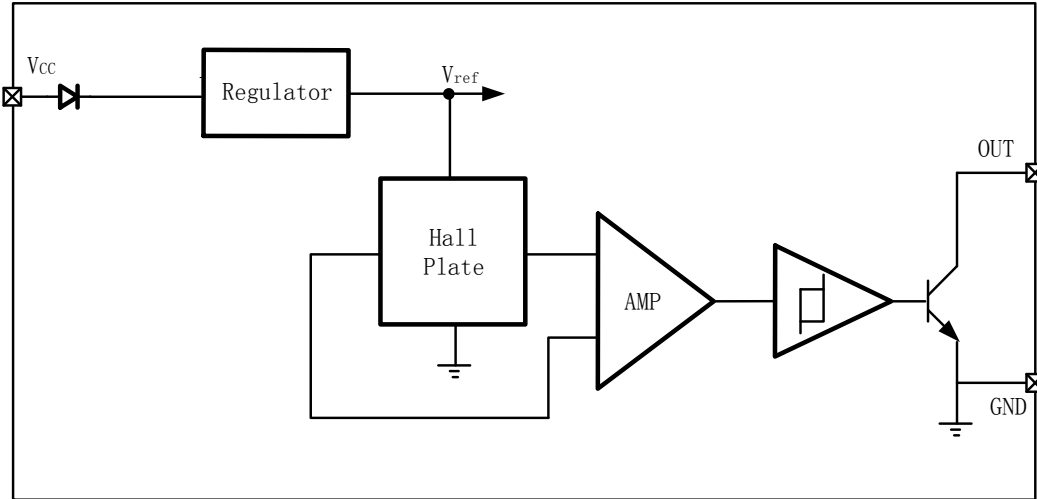
- Superior Temp stability over -40 to +150 °C for Automotive or Industrial applications
- 3.5V to 60V supply voltage
- High output current capability -60 mA absolute maximum
- Quad-Hall design virtually eliminates mechanical stress effects
- Temperature compensated magnetic
- Digital current sinking output
- SIP-3 pin in-line PCB terminals
- Operate/release points symmetrical around zero gauss

Potential Applications

- Speed and RPM (revolutions per minute) sensing
- Motor and fan control
- Flow-rate sensing
- Brushless dc motor commutation
- Auto-motive transmission position
- Robotics control



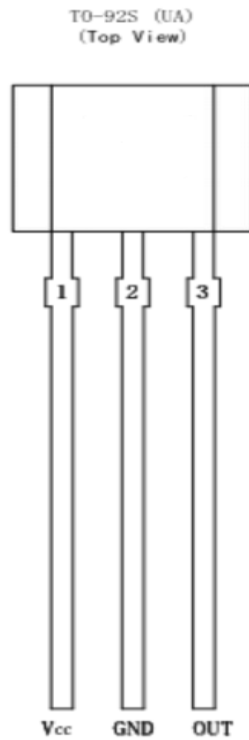
Function Block



Ordering Information

Part Number	Packing	Package	Temperature	Marking ID
DH851	1000 pcs/Bag	TO-92S	-40°C ~ 150°C	8513

Pin Description



TERMINAL		TYPE	DESCRIPTION
NAME	NUMBER		
V _{CC}	1	POWER	3.5V~60V power supply
GND	2	GROUND	Ground
OUT	3	OUTPUT	Open-drain output requires a pull-up resistor

Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V _{CC}	-60	60	V
Output Off Voltage	V _{CE}	-0.3	50	V
Output Sink Current (Continuous Current)	I _{OUT}	--	60	mA
Power Dissipation	PD	--	400	mW
Storage Temperature	T _s	-65	+150	°C
Junction Temperature	T _J	-40	+150	°C

⁽¹⁾ Stresses above those listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ESD Protection

Human Body Model and Machine Model tests according to: standard AEC-Q100-002 and AEC-Q100-003 respectively

ESD Test Mode	Parameter	Min.	Max.	Unit
HUMAN BODY MODE (HBM)	V _{ESD(HBM)}	-8000	8000	V
MACHINE MODE (MM)	V _{ESD(MM)}	-1000	1000	V

Thermal Characteristics

Type	Parameter	Test Conditions	值	单位
R _{θJA}	UA Package thermal resistance	Single-layer PCB, with copper limited to solder pads	166	°C/W
R _{θJA}	SO Package thermal resistance	Single-layer PCB, with copper limited to solder pads	228	°C/W



Electrical Characteristics

over operating free-air temperature range ($V_{DD} = 5.0V$, unless otherwise noted)

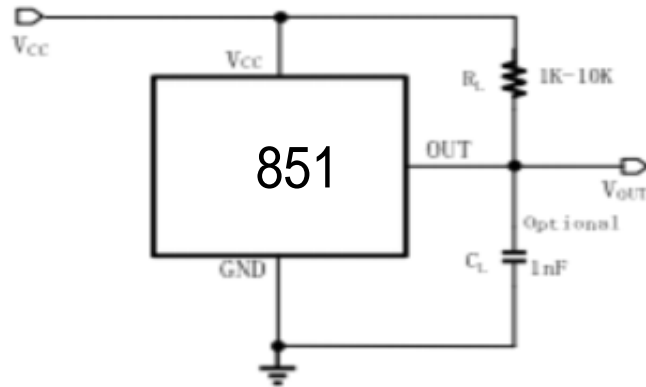
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Operating voltage	V_{CC}	$T_J < T_{J(Max.)}$	3.5		60	V
Supply Current	I_{CC}	$V_{CC}=3.5$ to 28V, $T_A=25^\circ C$		3.5	8	mA
Off-State Leakage Current	I_{LEAK}	Output Hi-Z		<0.1	10	μA
Output Saturation Voltage	V_{SAT}	$I_{out}=20mA$, $T_A=25^\circ C$		110	300	mV
Output rise time	t_r	$R1=1K\Omega$ $Co=20pF$		0.4	1.5	μs
Output fall time	t_f	$R1=1K\Omega$ $Co=20pF$		0.15	1.5	μs

Magnetic Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
B_{OP}	Operated point	$T_A=25^\circ C$	-	55	120	Gauss
B_{RP}	Release point		-120	-55	-	Gauss
B_{HYS}	Hysteresis			110	-	Gauss



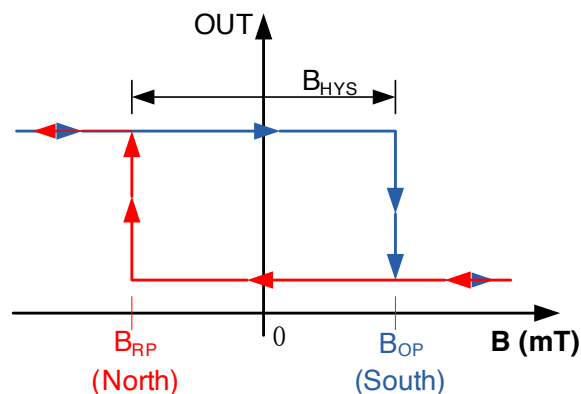
Typical Application



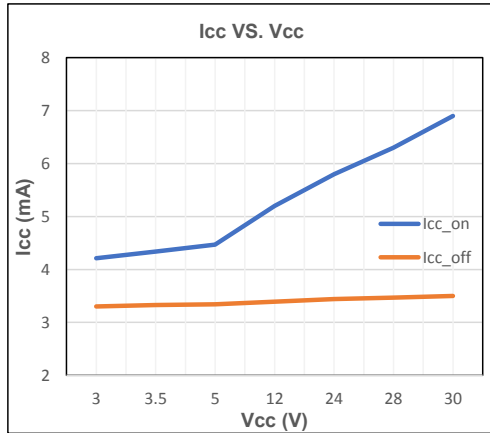
The DH851 contains an on-chip voltage regulator and can operate over a wide supply voltage range. In applications that operate the device from an unregulated power supply, transient protection must be added externally. For applications using a regulated line, EMI/RFI protection may still be required. It is recommended to shunt C1 capacitors to the ground near the chip VCC power supply, with a typical value of 0.1 μ F. At the same time in the external optional series resistor R1 their typical values for 100 Ω . The output capacitor C_L is used as the output filter, typically 1nF.

Transfer Function

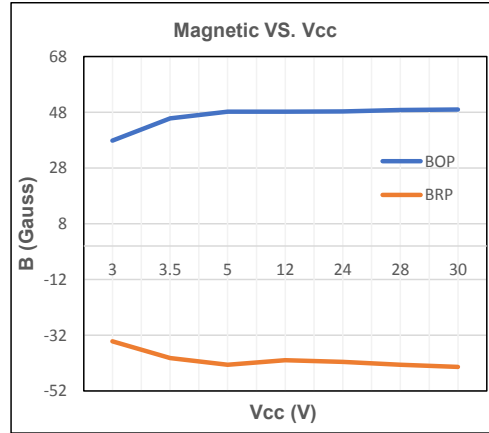
Powering-on the device in the hysteresis region, less than B_{OP} and higher than B_{RP}, allows an indeterminate output state. The correct state is attained after the first excursion beyond B_{OP} or B_{RP}. If the field strength is greater than B_{OP}, then the output is pulled low. If the field strength is less than B_{RP}, the output is released.



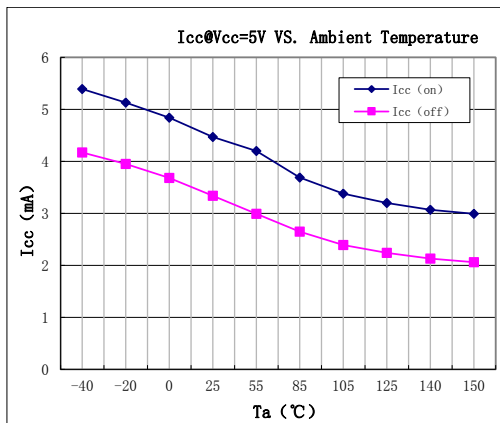
Typical Characteristics



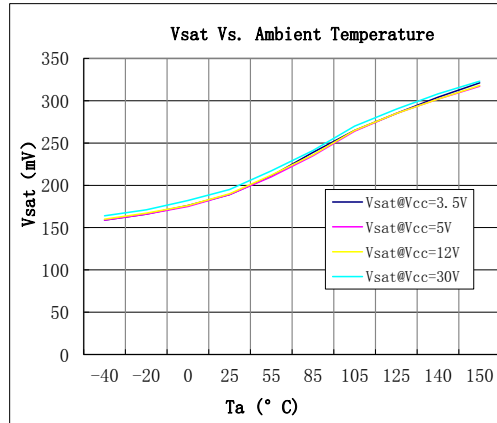
Supply Current vs. Supply Voltage



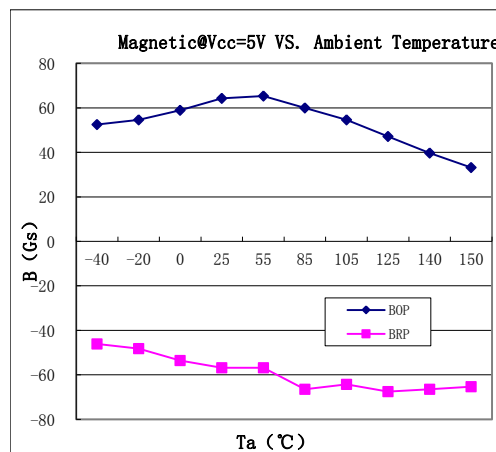
Magnetic VS. Supply Voltage



Supply Current vs. Ambient Temperature



Saturation Voltage vs. Ambient Temperature

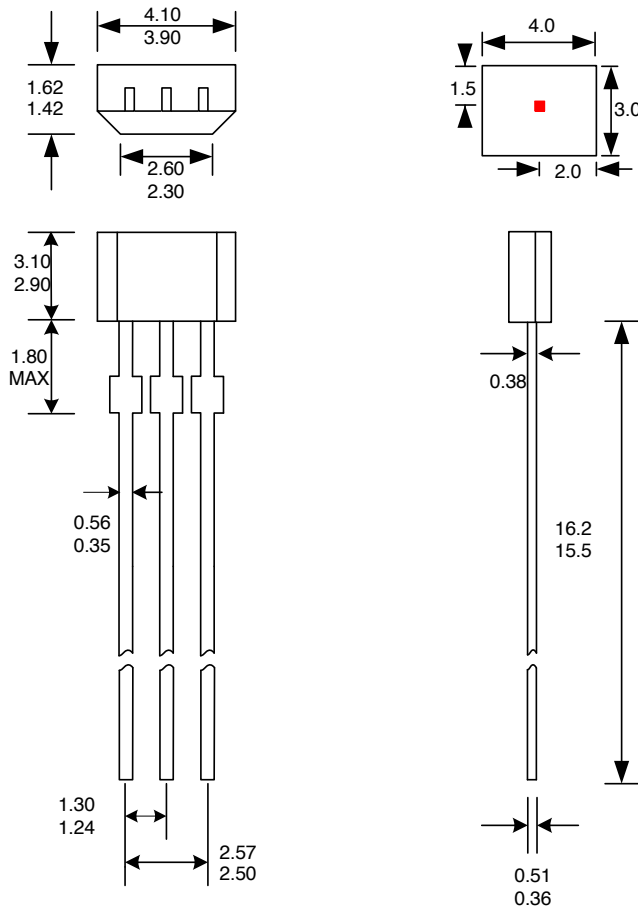


Magnetic VS. Ambient Temperature

Package Information: TO-92S (UA)

3-Terminal
UA Package

Dimension:mm



Notes:

1. Exact body and lead configuration at vendor's option within limits shown .
2. Height does not include mold gate flash .

Where no tolerance is specified , dimension is nominal .