

VF360ST-C3

VF460S-C3

High sensitivity digital Hall Effect Sensor

DESCRIPTION

The VF360/VF460 High Sensitivity Latching Digital Hall-Effect Sensor ICs are small, sensitive and versatile devices that are operated by the magnetic field from a permanent magnet. They are designed to respond to alternating North and South poles. For brushless dc motor manufacturers who need latching sensors with reliable, consistent performance for more efficient and smaller designs and low power consumption.

When the South Pole points to the front of the chip and the magnetic induction intensity is greater than or equal to BOP, the OUT pin outputs a low level. When the North Pole points to the front of the chip and the magnetic induction intensity is less than or equal to BRP, the OUT pin outputs a high level. Remove the magnetic field and maintain the previous output state.

The hysteresis, BHYST, prevents the output from oscillating around the switching point.

NOTICE

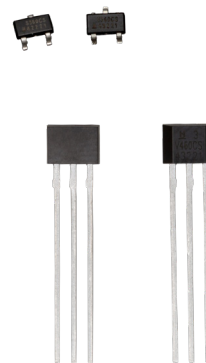
In order to avoid the decay of permanent magnets at low or high temperatures and affect the normal operation of the IC, it is recommended to leave enough margin for the magnetic field received by the chip surface.

FEATURES

- AEC-Q100 automotive qualified
- High ESD rating / Excellent EMC performance
- Digital Bipolar-Latch Hall Sensor
- Sensitivity typical value (BOP / BRP): +30 / -30 Gauss
- On board voltage regulator for 2.5V to 22V range
- Output short-circuit protection
- Reverse-battery and freewheeling protection
- Chopper stability enables a stable operating point over the entire operating temperature range
- Wide Operating temperature range: -40 to 150 °C
- RoHS & REACH-compliant material

APPLICATION

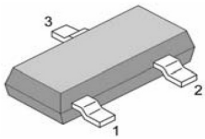
- Auto window regulator
- Auto seat motor
- Auto wiper motor
- Speed and RPM sensing
- Brushless DC motor
- Angular position detection
- Motor and fan control



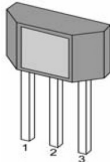
DIGITAL HALL EFFECT SENSOR VF360ST-C3 VF460S-C3

PIN DEFINITIONS AND DESCRIPTIONS

SOT-23-3L	TO-92S	NAME	TYPE	FUNCTION
1	1	VDD	Supply	Supply Voltage pin
2	3	OUT	Output	Open Drain Output pin
3	2	GND	Ground	Ground pin



SOT-23-3L



TO-92S

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	MIN	MAX	UNITS
V_{DD}	Supply voltage	-	24	V
V_{RDD}	VDD Reverse Voltage; GND:22V;VDD:to ground	-22	-	V
I_{DD}	Supply Current (Quiescent Current)	-	20	mA
V_{out}	Output Voltage	-0.3	24	V
I_{OUT}	Output Current	-	25	mA
T_A	Operating Ambient Temperature	-40	150	°C
T_S	Storage Temperature	-55	165	°C
T_J	Junction temperature	-55	165	°C
B	Magnetic Flux	No Limit		Gauss
V_{ESD1}	Human Body Model	+/-8000		V
V_{ESD2}	Charged Device Model	750		V

NOTICE Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolutemaximum- rated conditions for extended periods may affect device reliability.

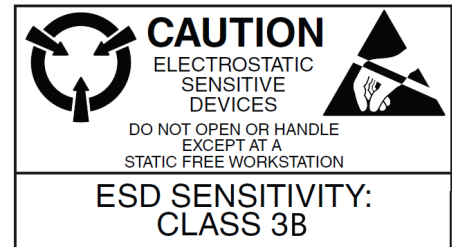
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PARAMETERS SPECIFICATION (VDD=3.3V SUPPLY, TA= -40°C TO 150°C EXCEPT WHERE OTHERWISE SPECIFIED.)

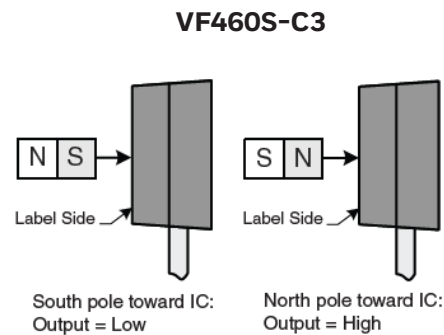
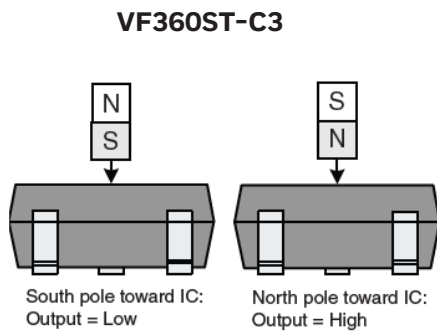
SYMBOL	PARAMETER	TEST CONDITION	MIN	TYPE	MAX	UNITS
V _{DD}	Supply voltage	-40 °C to 150 °C	2.5	-	22	V
I _{DD}	Supply Current	VDD = 2.5V to 22V	-	1.6	3	mA
IOUT _{lim}	Output Current Limit	TA = 25°C, Short-Circuit Protection	30	-	90	mA
VDSon	Output saturation voltage	at 20mA, Gauss >BOP	-	-	0.4	V
V _{ZSUPPLY}	Supply Zener Clamp Voltage	ICC = 7 mA; TA = 25°C	24	-	-	V
V _{ZOUT}	Output Zener Clamp Voltage	IOUT = 3mA; TA = 25°C	24	-	-	V
TR	Output rise time	RLOAD = 820 Ω, CLOAD= 10 Pf; TA = 25°C	-	-	2	us
TF	Output fall time	RLOAD = 820 Ω, CLOAD= 10 Pf; TA = 25°C	-	-	2	us
FSW	Maximum switching frequency		20	30	-	KHz
Bop	Magnetic operating point	VDD = 3.3V , TA=-40~150°C	10		50	Gauss
Brp	Magnetic release point	VDD = 3.3V , TA=-40~150°C	-50	-	-10	Gauss
BHYST	Magnetic hysteresis window	VDD = 3.3V , TA=-40~150°C	35	-	85	Gauss
T	Operating temperature		-40	-	150	°C

NOTICE

The magnetic field strength (Gauss) required to cause the switch to change state (operate and release) will be as specified in the magnetic characteristics. To test the switch against the specified limits, the switch must be placed in a uniform magnetic field.

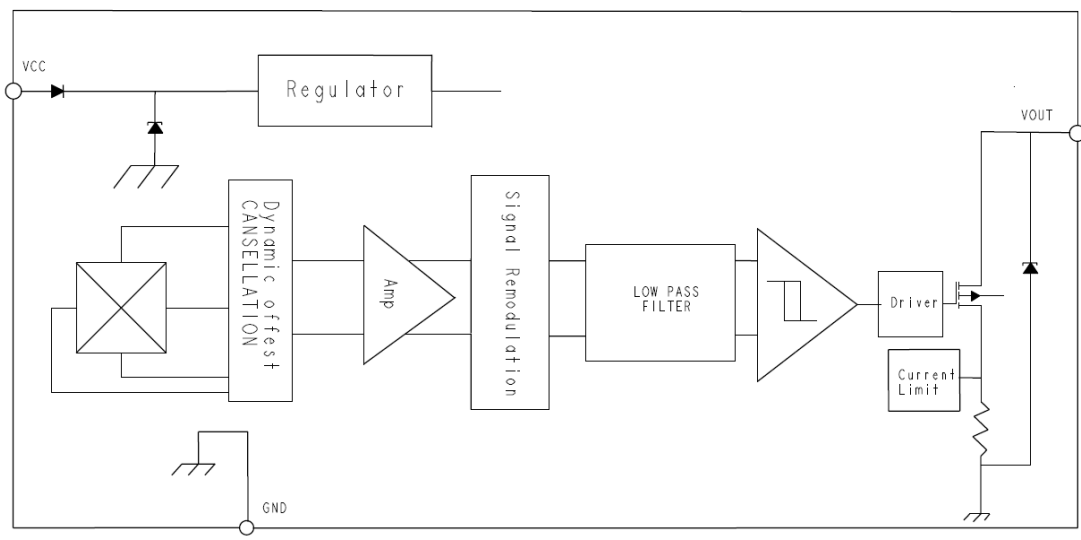


MAGNETIC ACTIVATION

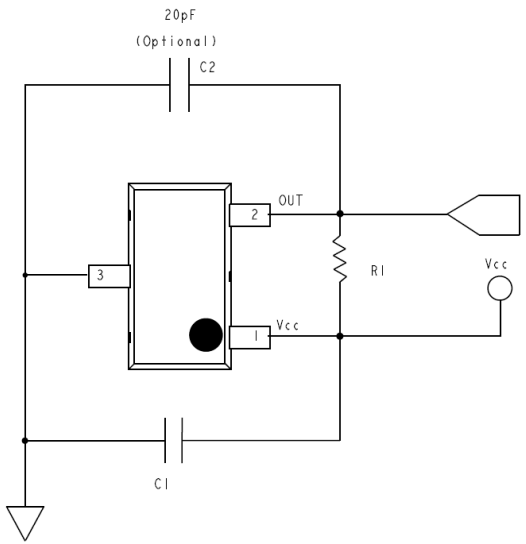


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SENSOR IC BLOCK DIAGRAM



TYPICAL APPLICATION



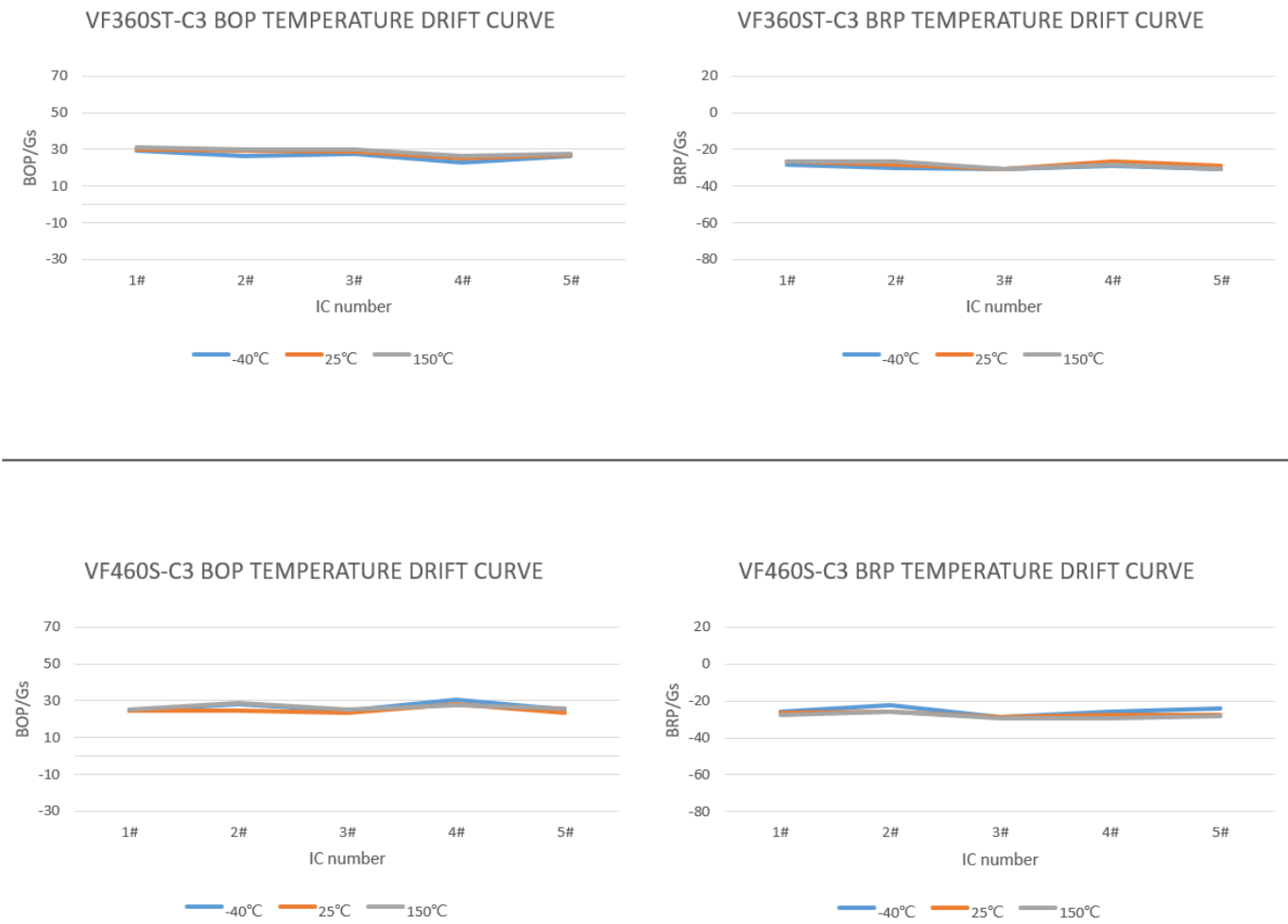
NOTICE

1. For proper operation, a 100nF bypass capacitor C1 should be placed as close as possible to the VDD and ground pin.
2. The pull-up resistor R1 value should be chosen in to limit the current through the output pin below the maximum allowed, the recommended range of R1 is 1K Ω to 22K Ω .

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TEMPERATURE DRIFT CURVE

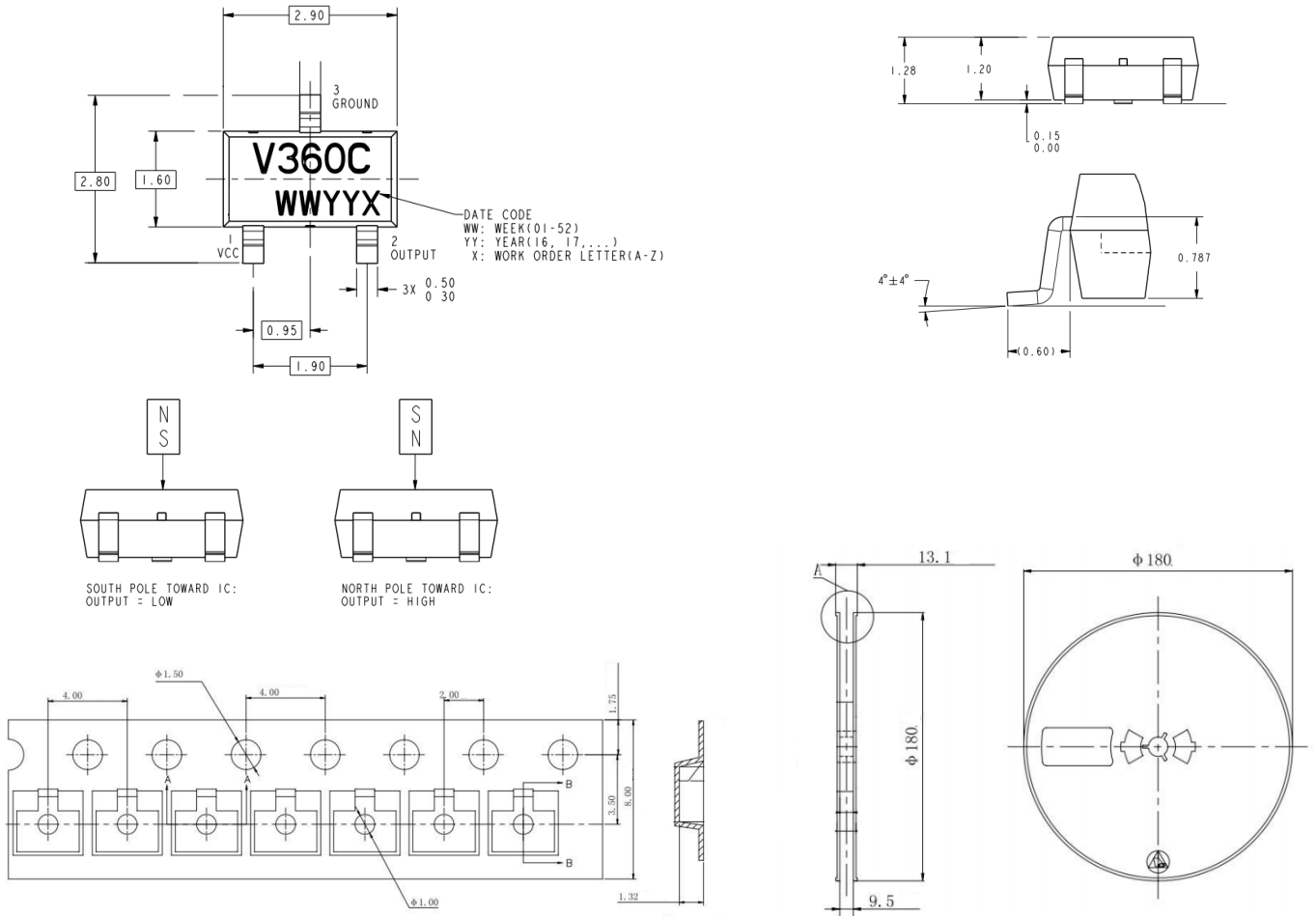
Under the condition of 3.3V, temperature drift curve:



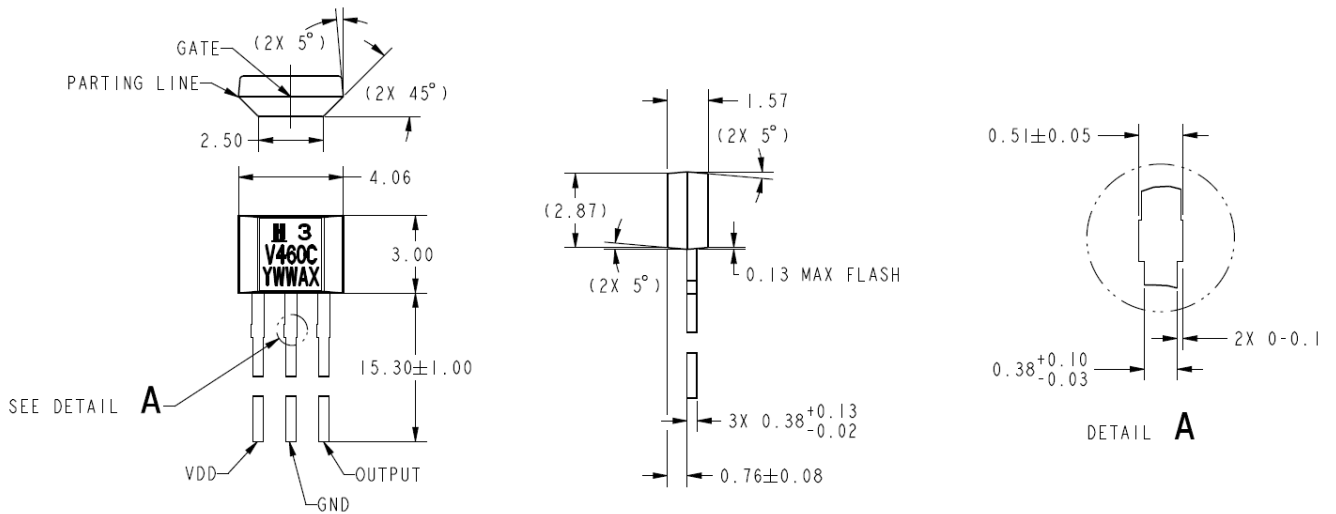
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FOOTPRINT INFORMATION

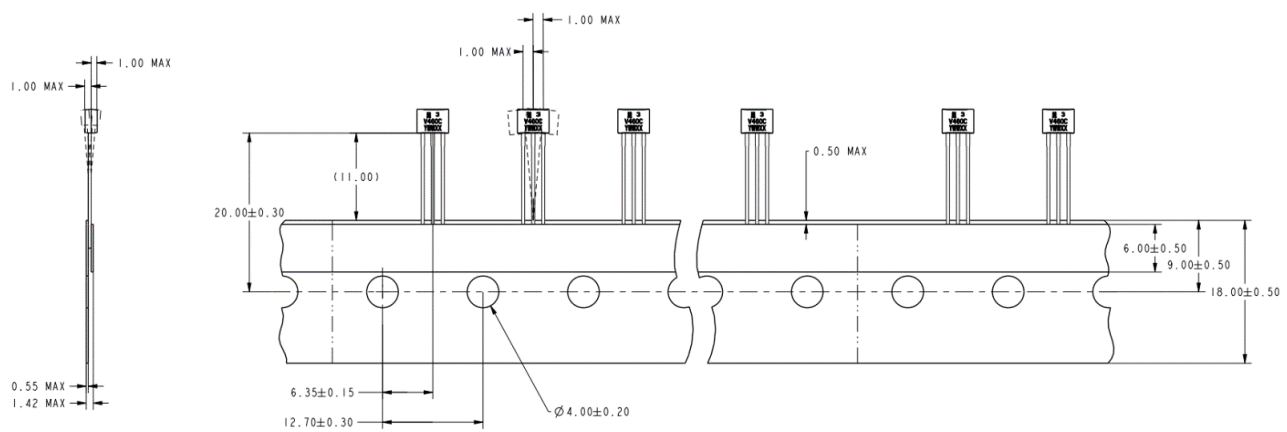
SOT-23-3L:





TO-92S:



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PIN DEFINITIONS AND DESCRIPTIONS

Catalog listing and description	
Catalog Listing: VF460S-C3	
Description: Straight standard leads, bulk pack, 1000 units/bag	
Catalog Listing: VF460S-C3-T3	
Description: Straight standard leads, ammopack tape-in-box, 5000 units/box	

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective.

The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

FOR MORE INFORMATION

Honeywell services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit our [website](#) or call:

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WARNING PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARNING MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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