

# Installation Instructions for the SS400 Series Temperature Compensated Digital Hall-Effect Sensor ICs

ISSUE 6

PK 88700

## GENERAL INFORMATION

### CAUTION

#### ELECTROSTATIC DISCHARGE DAMAGE

This component is sensitive to electrostatic discharge (ESD). Take normal ESD precautions in handling this product to prevent ESD-induced damage and/or degradation.

**Failure to comply with these instructions may result in product damage.**



## SOLDERING/ASSEMBLY

### CAUTION

#### IMPROPER SOLDERING

- Ensure leads are supported during any forming/ shearing operation so that they are not stressed inside the plastic case.
- Limit exposure to high temperatures.

**Failure to comply with these instructions may result in product damage.**

PC board wave soldering temperature is 250 °C to 260 °C [482 °F to 500 °F] peak for 3 s max.

## CLEANING

### CAUTION

#### IMPROPER CLEANING

Do not use pressure wash. High-pressure stream could force contaminants into the package.

**Failure to comply with these instructions may result in product damage.**

Use agitated rinse to clean the sensor.

**Table 1. Absolute Maximum Ratings**

Characteristic	Parameter
Supply voltage	-1 Vdc to +30 Vdc
Voltage externally applied to output	+30 Vdc max. (OFF only) -0.5 Vdc min. (OFF or ON)
Output ON current	see Table 2
Operating temperature	-40 °C to 150 °C [-40 °F to 302 °F]
Storage temperature	-50 °C to 150 °C [-58 °F to 302 °F]
Magnetic flux	no limit; circuit cannot be damaged by magnetic overdrive

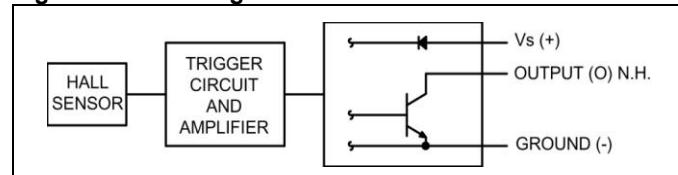
## NOTICE

Absolute maximum ratings are the extreme limits that the device will withstand without damage to the device. However, the electrical and mechanical characteristics are not guaranteed as the maximum limits (above recommended operating conditions) are approached, nor will the device necessarily operate at absolute maximum ratings.

**Table 2. Output Current Absolute Limits**

Supply Voltage	Output Current
-1 Vdc to 24 Vdc	50 mA max.
24 Vdc to 25 Vdc	37 mA max.
25 Vdc to 26 Vdc	33 mA max.
26 Vdc to 27 Vdc	28 mA max.
27 Vdc to 28 Vdc	24 mA max.
28 Vdc to 29 Vdc	19 mA max.
29 Vdc to 30 Vdc	15 mA max.

**Figure 1. Block Diagram**



**Table 3. Operating Characteristics (over operating voltage and temperature, unless otherwise noted)**

Characteristic	Min.	Typ.	Max.	Note
Supply voltage	3.8 Vdc	—	30 Vdc	—
Current consumption	—	—	10 mA	—
Supply current (operated at 25 °C, Vs = 5 V)	—	6.5 mA	—	—
Output voltage (operated)	—	—	0.40 Vdc	sinking, 20 mA max.
Output current (operated)	—	—	20 mA	—
Output leakage current (released)	—	—	10 µA	—
Output switching time: rise, 10% to 90%	—	0.05 µs	1.5 µs	Vcc = 12 V, RL = 1.6 kΩ,
fall, 90% to 10%	—	0.15 µs	1.5 µs	CL = 20 pF

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Table 4. Magnetic Characteristics

Temperature	Operating Characteristic	Catalog Listing						
		SS411A SS411A-L SS411A-T2 SS411A-T3	SS413A SS413A-L SS413A-T2 SS413A-T3	SS441A SS441A-L SS441A-T2 SS441A-T3	SS443A SS443A-L SS443A-T2 SS443A-T3	SS449A SS449A-L SS449A-T2 SS449A-T3	SS461A SS461A-L SS461A-T2 SS461A-T3	SS466A SS466A-L SS466A-T2 SS466A-T3
		Bipolar	Bipolar	Unipolar	Unipolar	Unipolar	Latching	Latching
-40 °C [-40 °F]	min. op.	NS	NS	50 G	110 G	285 G	5 G	100 G
	max. op.	70 G	140 G	135 G	215 G	435 G	110 G	200 G
	min. rel.	-70 G	-140 G	20 G	80 G	210 G	-110 G	-200 G
	max. rel.	NS	NS	120 G	190 G	360 G	-5 G	-100 G
	min. dif.	15 G	20 G	15 G	25 G	30 G	50 G	200 G
0 °C [32 °F]	min. op.	NS	NS	53 G	110 G	305 G	5 G	100 G
	max. op.	65 G	140 G	117 G	190 G	400 G	90 G	185 G
	min. rel.	-65 G	-140 G	20 G	80 G	230 G	-90 G	-185 G
	max. rel.	NS	NS	99 G	165 G	325 G	-5 G	-100 G
	min. dif.	15 G	20 G	15 G	25 G	30 G	50 G	200 G
25 °C [77 °F]	min. op.	NS	NS	55 G	110 G	310 G	10 G	100 G
	max. op.	60 G	140 G	115 G	180 G	390 G	85 G	180 G
	min. rel.	-60 G	-140 G	20 G	75 G	235 G	-85 G	-180 G
	max. rel.	NS	NS	95 G	155 G	31 G5	-10 G	-100 G
	min. dif.	15 G	20 G	20 G	25 G	30 G	50 G	200 G
85 °C [185 °F]	min. op.	NS	NS	45 G	90 G	290 G	110 G	95 G
	max. op.	60 G	140 G	120 G	180 G	400 G	85 G	180 G
	min. rel.	-60 G	-140 G	15 G	70 G	215 G	-85 G	-180 G
	max. rel.	NS	NS	105 G	165 G	325 G	-10 G	-95 G
	min. dif.	12 G	20 G	15 G	15 G	30 G	50 G	190 G
125 °C [257 °F]	min. op.	NS	NS	40 G	80 G	270 G	5 G	80 G
	max. op.	65 G	140 G	123 G	190 G	410 G	100 G	180 G
	min. rel.	-65 G	-140 G	15 G	60 G	200 G	-100 G	-180 G
	max. rel.	NS	NS	115 G	180 G	340 G	-5 G	-80 G
	min. dif.	12 G	20 G	8 G	10 G	30 G	50 G	160 G
150 °C [302 °F]	min. op.	NS	NS	35 G	65 G	260 G	5 G	70 G
	max. op.	70 G	140 G	125 G	200 G	420 G	110 G	185 G
	min. rel.	-70 G	-140 G	10 G	55 G	185 G	-110 G	-185 G
	max. rel.	NS	NS	120 G	195 G	345 G	-5 G	-70 G
	min. dif.	10 G	20 G	5 G	5 G	30 G	50 G	140 G

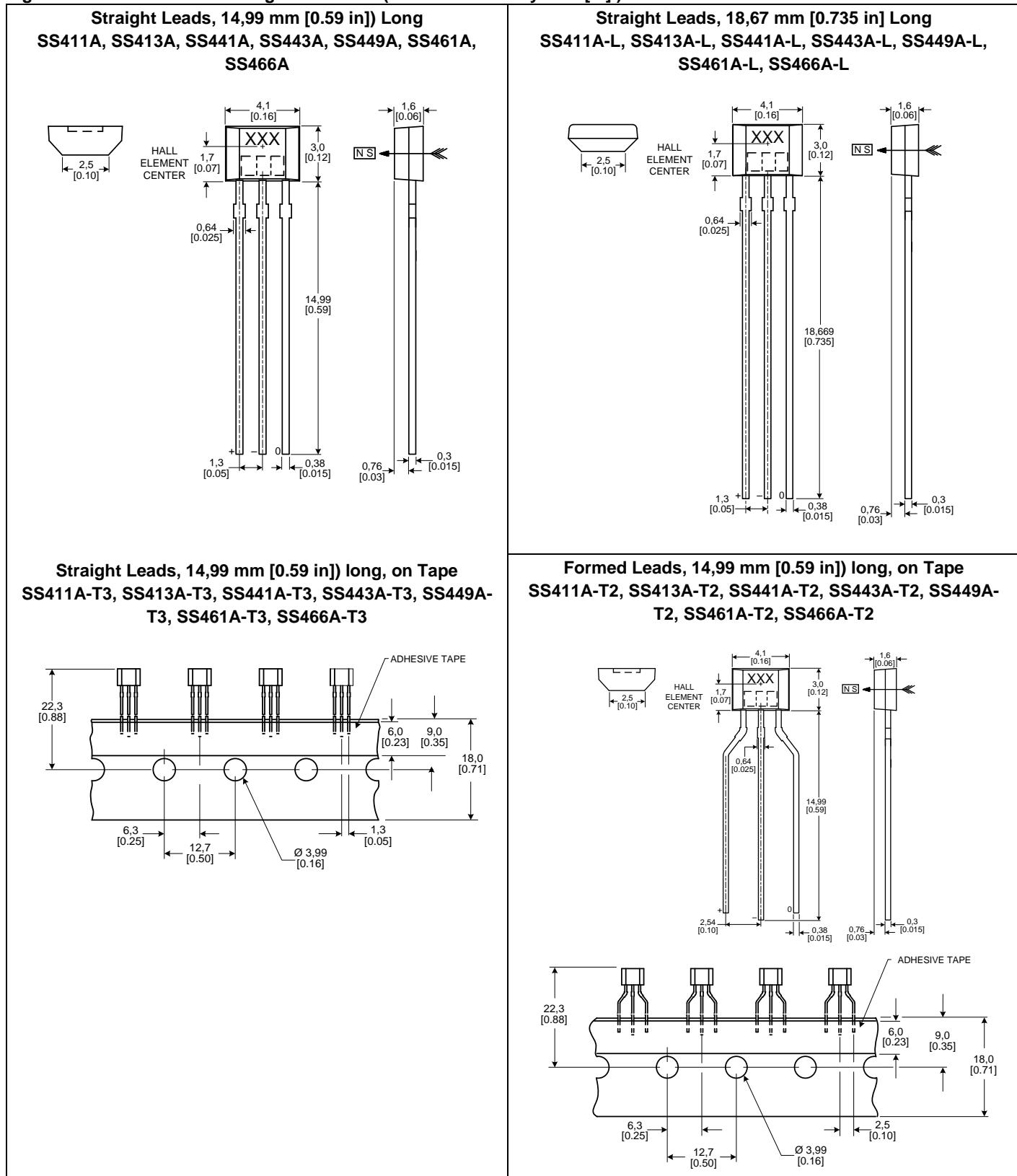
## NOTICE

Bipolar Hall-effect sensors may have an initial output in either the ON or OFF state if powered up with an applied magnetic field in the differential zone (applied magnetic field >Brp and <Bop). Honeywell recommends allowing 10 µs for output voltage to stabilize after supply voltage has reached 5 V.

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Figure 5. SS400 Series Mounting Dimensions (For reference only. mm/[in].)

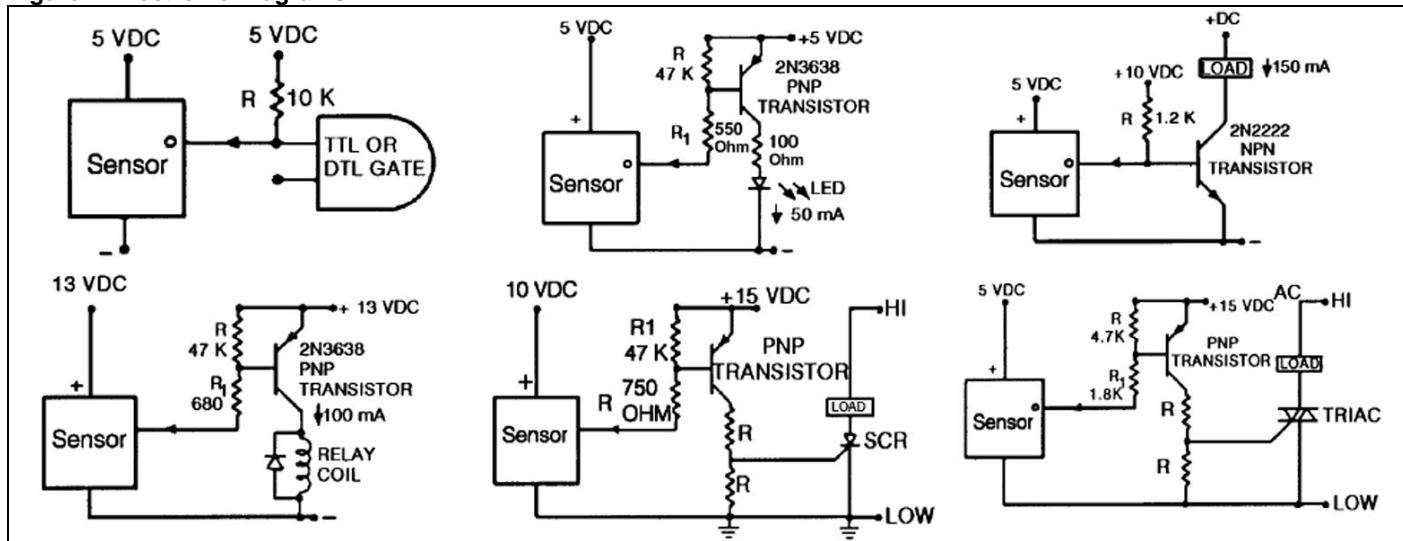


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#### Figure 4. Electronic Diagrams



## **! 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.**

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**WARRANTY/REMEDY**  
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## **! WARNING**

## **MISUSE OF DOCUMENTATION**

- The information presented in this application note 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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