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Installation Instructions for the SS351AT/SS451A/SS551AT Omnipolar Digital Hall-Effect Sensor ICs

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GENERAL INFORMATION

The SS351AT, SS451A and SS551AT are omnipolar devices, meaning that they may be turned on (output low) by either a North pole or a South pole. The device will turn off (output high) when the magnetic field is removed.

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

SOLDERING INSTRUCTIONS

- Ensure leads are adequately 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.

Surface-mount (SS351AT and SS551AT): Use an infrared reflow process with temperatures of 245 °C [473 °F] peak for 10 s max.

Through-hole leads (SS451A): Wave solder at 250 °C to 260 °C [482 °F to 500 °F] for 3 s max.

Figure 2. Current Sinking Output Block Diagram

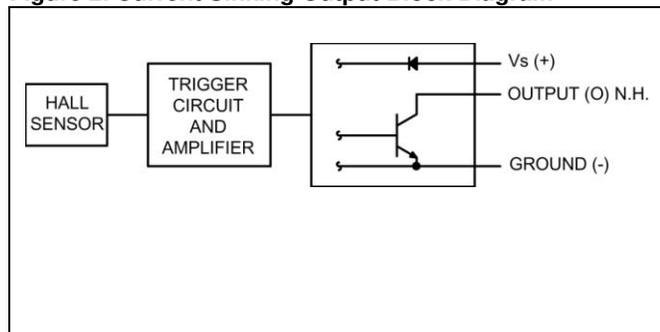


Table 1. Absolute Maximum Ratings

Characteristic	Min.	Typ.	Max.	Unit
Supply voltage	-28.0	–	28.0	V
Applied Output Voltage	-0.5	–	28.0	V
Output Current	–	–	20	mA
Magnetic Flux	–	–	no limit	Gauss

Note 1: 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 magnetic characteristics, the switch must be placed in a uniform magnetic field.

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.

Figure 1. SS351AT Rated Supply Voltage vs Temperature

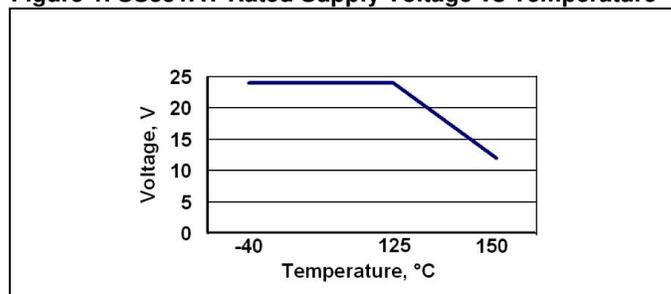


Figure 3. Typical SS351AT/SS451A/SS551AT Magnetic Performance vs Temperature

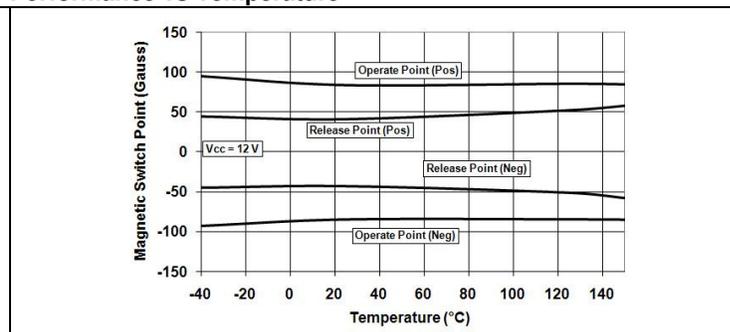


Table 2. SS351AT/SS451A/SS551AT Specifications (At Vs=3.0 Vdc to 24 Vdc, 20 mA load, TA=-40 °C to 150 °C [-40 °F to 257 °F].)

Characteristic	Condition	Minimum	Typical	Maximum	Unit
Supply voltage ¹ :					
SS451A/SS551AT	-40 °C to 150 °C [-40 °F to 302 °F]	3	–	24	Vdc
SS351AT	-40 °C to 125 °C [-40 °F to 257 °F]	3	–	24	
SS351AT	150 °C [302 °F]	3	–	12	
Supply current	Vsupply = 5 V at 25 °C [77 °F] Vsupply = 3 V at 25 °C [77 °F]	– –	4.5 3.5	6 5	mA
Output current	–	–	–	20.0	mA
Vsat	at 20 mA, Gauss > Bop positive or Gauss < Bop negative	–	–	0.4	V
Output leakage current	Gauss > Bop+ or < Bop-	–	–	10	µA
Output switching time:					
rise	Vsupply = 12 V at 25 °C [77 °F], RL = 1.6 kOhm, CL = 20 pF	–	–	1.5	µs
fall		–	–	1.5	
Thermal resistance:					
SS451A	–	–	233	–	°C/W
SS351AT		–	303	–	
SS551AT		–	210	–	
Operate:					
positive	–	35	85	135	Gauss
negative		-135	-85	-35	
Release:					
positive	–	10	40	120	Gauss
negative		-120	-40	-10	
Differential	–	5	45	80	Gauss
Operating temperature	–	-40 [-40]	–	150 [302]	°C [°F]
Storage temperature	–	-40 [-40]	–	150 [302]	°C [°F]

Note 1: See Figure 1.

Figure 4. Sample Wiring Diagrams: Sinking Output Sensor

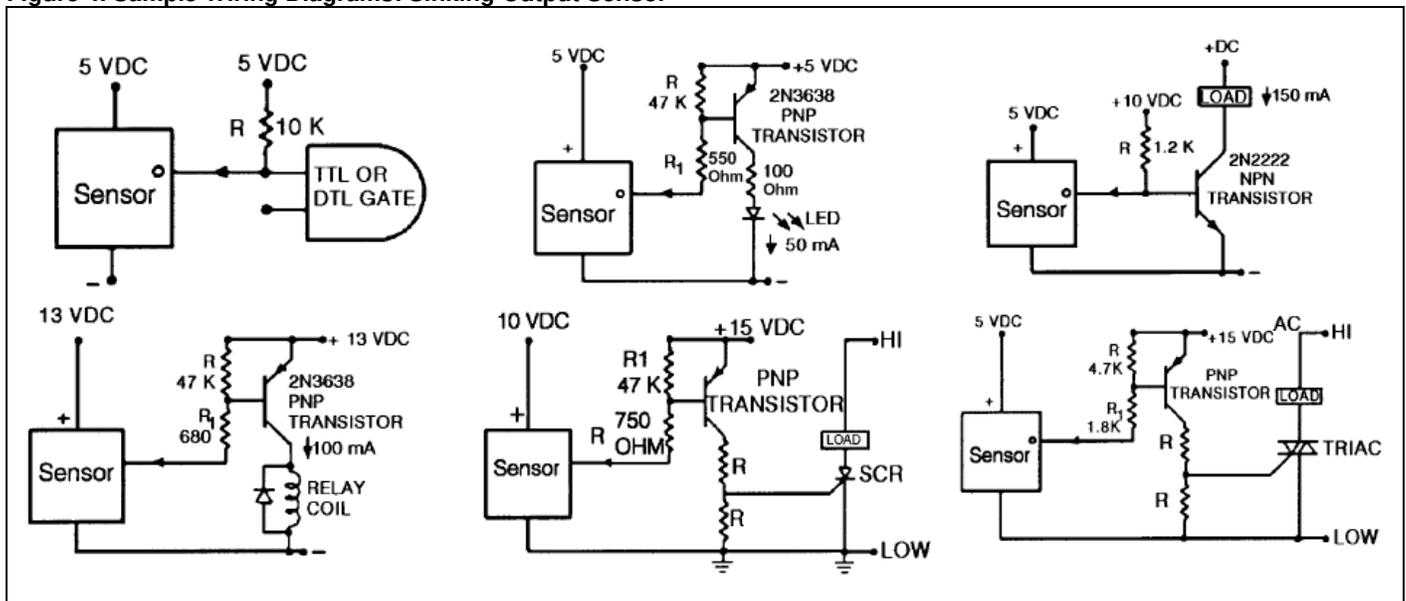


Figure 5. SS351AT Mounting/Tape and Reel Dimensions (For reference only. mm/[in].)

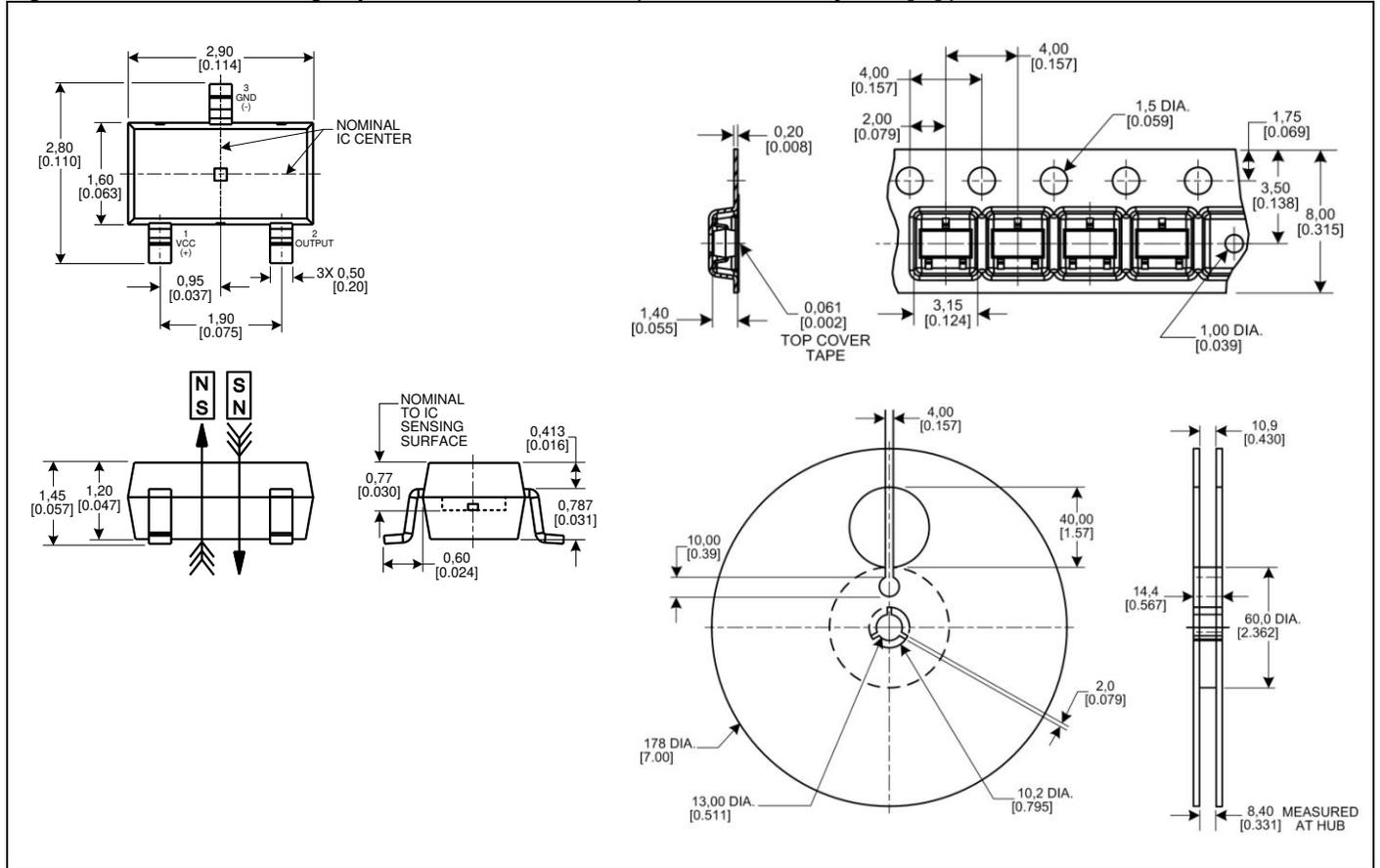


Figure 6. SS451A Mounting Dimensions (For reference only. mm/[in].)

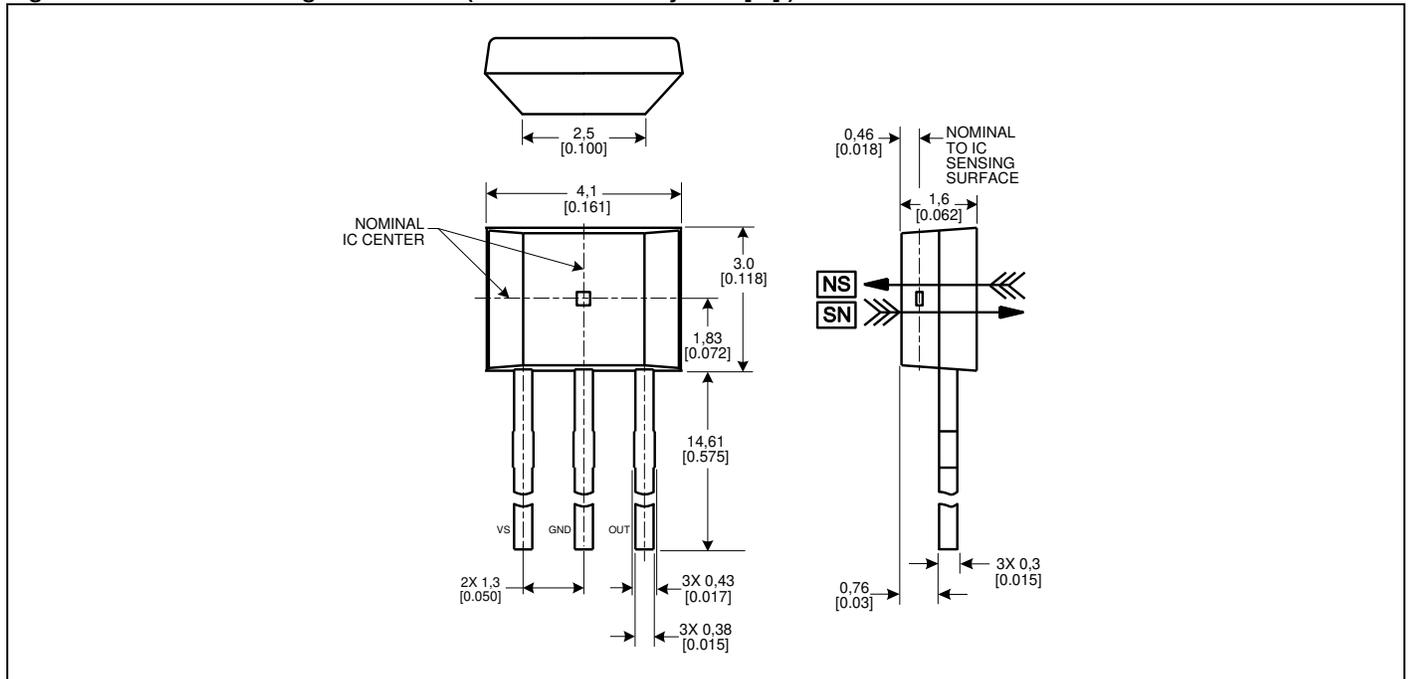
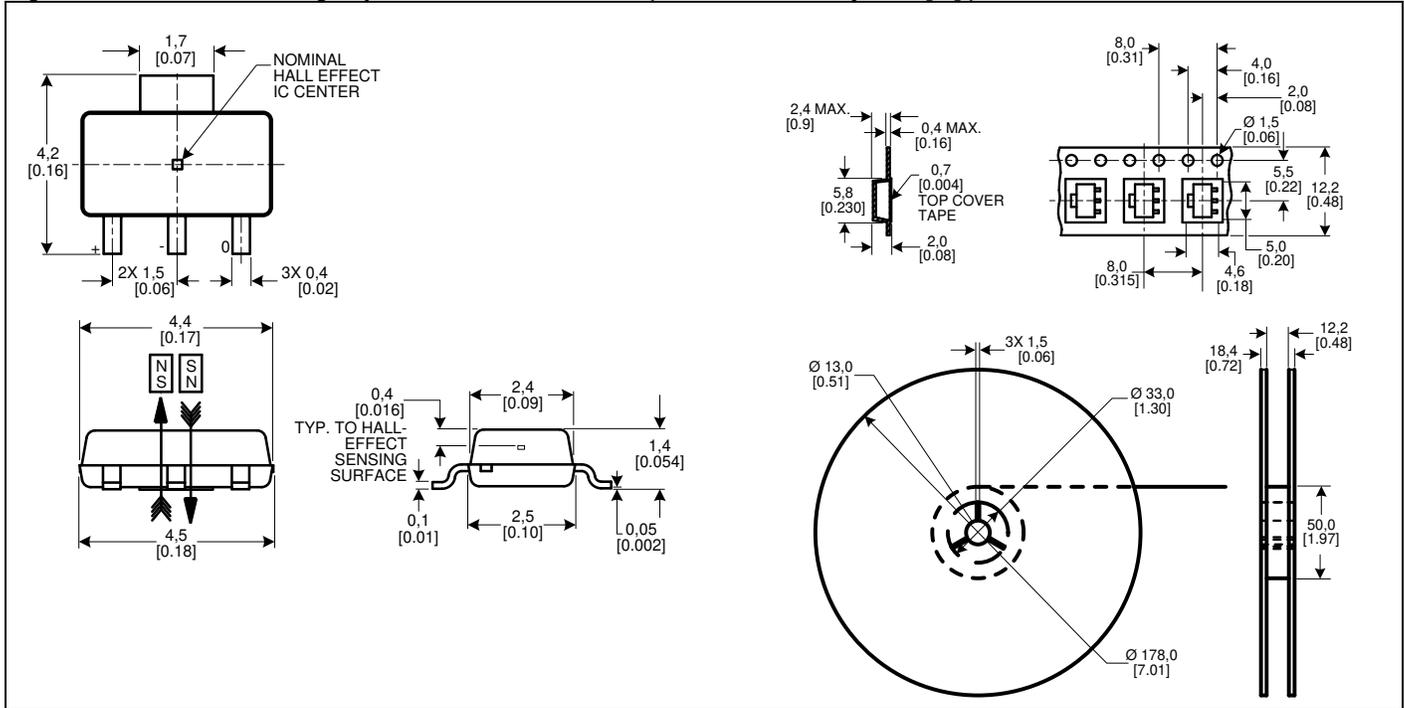


Figure 7. SS551AT Mounting/Tape and Reel Dimensions (For reference only. mm/[in].)



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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