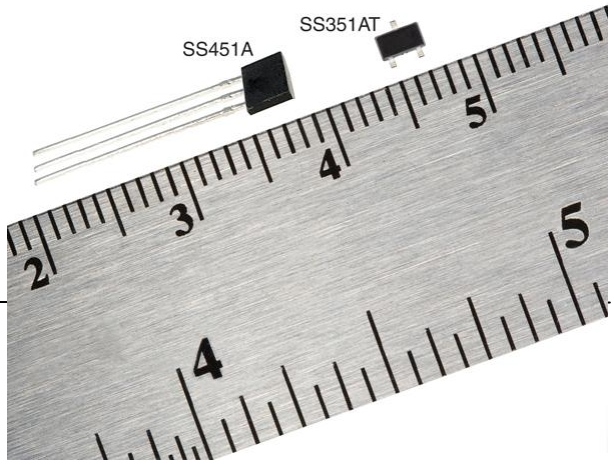
Honeywell

SS351AT/SS451A

Omnipolar Hall-effect Digital Position Sensors



DESCRIPTION

The SS351AT and SS451A sensors are small, versatile digital Hall-effect devices that are operated by the magnetic field from a permanent magnet or an electromagnet. They are designed to respond to a either a North pole or a South pole.

These omnipolar sensors are sensitive and flexible devices designed to meet a wide range of potential applications. The SS351AT and SS451A have a typical operating point of 85 G at 25 °C [77 °F]. Because they can be operated by a North pole or a South pole, they do not require the magnet polarity to be identified, thus making the installation easier and potentially reducing the system cost.

These sensors are available in two package styles. The SS351AT is available in the subminiature SOT-23 surface mount package; the SS451A is available in the leaded, flat TO-92-style package. The SS351AT's small size requires less PC board space, allowing it to be used in smaller assemblies. Its 3 Vdc capability allows for use in low voltage applications, promoting energy efficiency.

The SS351AT is available on tape and reel (3000 units per reel); the SS451A is available in a bulk package (1000 units per bag).

FEATURES

- Subminiature package size (SS351AT) supplied on tape and reel allows for a compact design with automated component placement, helping to reduce manufacturing costs
- Simple activation from a North pole or a South pole and sensitive magnetics make this omnipolar product suitable in a variety of potential motion control, lid closure detection, and displacement sensing applications
- Low voltage 3 Vdc capability helps reduce power consumption
- Built-in reverse polarity protection protects the device from potential damage during installation
- Thermally balanced integrated circuit provides for stable operation over a wide temperature range of -40° to 150 °C [-40 °F to 302 °F]
- RoHS-compliant materials meet Directive 2002/95/EC

POTENTIAL APPLICATIONS

Commercial:

- Speed and RPM (revolutions per minute) sensing in fitness equipment
- Magnetic encoder for building access
- Damper or valve position control in HVAC (heating, ventilation and air conditioning) equipment
- Flow rate sensing in appliances and water softeners
- Printer head position sensing

Industrial:

- Flow rate sensing in industrial processes
- Robotic control (cylinder position monitoring)
- Float-based fluid level sensing

Medical:

- Displacement sensor in hospital beds and medical equipment
- Medication bin monitor on portable drug carts

Table 1. SS351AT/SS451A Specifications (At Vs=3.0 Vdc to 24 Vdc, 20 mA load, T_A = -40 °C to 150 °C [-40 °F to 257 °F])

Characteristic	Condition	Minimum	Typical	Maximum	Unit
Supply voltage[1]:					
SS451A	-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]	–	4.5	6	mA
	Vsupply = 3 V at 25 °C [77 °F]	–	3.5	5	
		–	–	9	
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:	Vsupply = 12 V at 25 °C [77 °F], R_L =1.6 KOhm, C_L = 20 pF				µs
rise		–	–	1.5	
fall		–	–	1.5	
Thermal resistance:					°C/W
SS451A	–	–	233	–	
SS351AT		–	303	–	
SS351AT/SS451A:					gauss
Operate positive	–	35	85	135	
Operate negative		-135	-85	-35	
SS351AT/SS451A:					gauss
Release positive	–	10	50	120	
Release negative		-120	-50	-10	
SS351AT/SS451A					gauss
Differential	–	5	35	80	
Operating temperature	–	-40 [-40]	–	150 [302]	°C [°F]
Storage temperature	–	-40 [-40]	–	150 [302]	°C [°F]

Note 1: See Figure 1.

Table 2. SS351AT/SS451A Absolute Maximum Ratings[1]

Characteristic	Minimum	Typical	Maximum	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

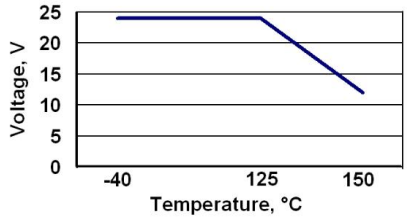


Figure 2. Current Sinking Output Block Diagram

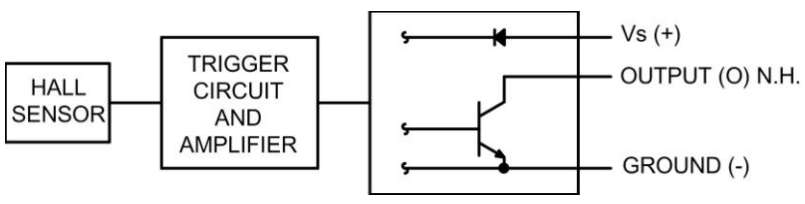


Figure 3. Typical SS351AT/SS451A Magnetic Performance vs Temperature

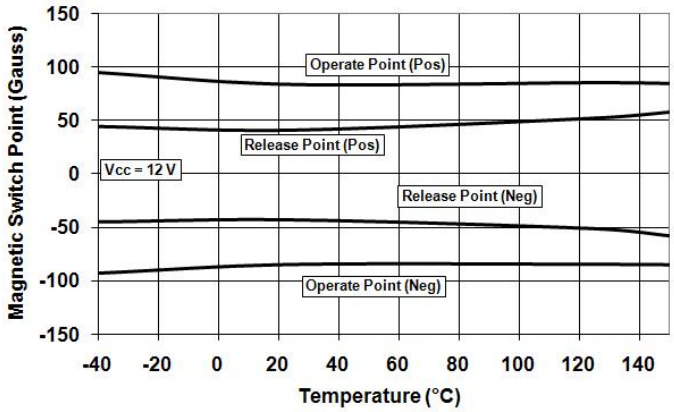


Figure 4. Wiring Diagrams

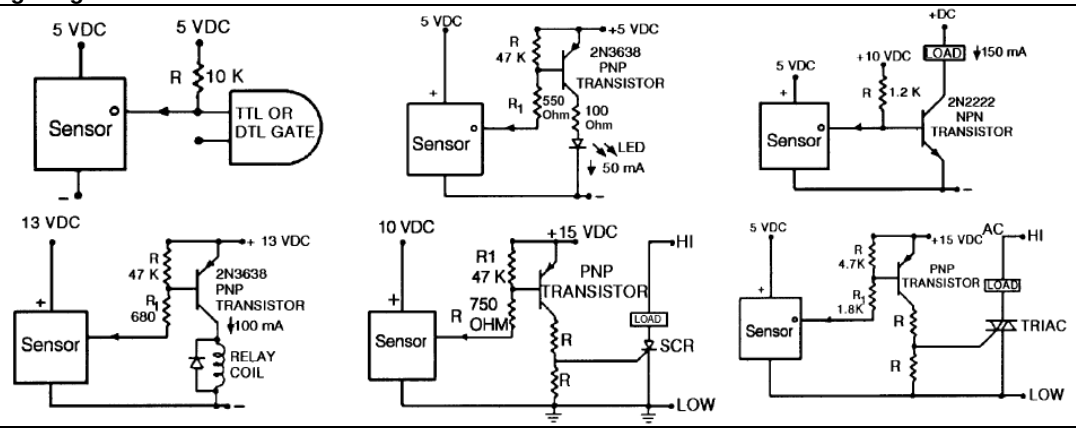


Figure 5. SS351AT Mounting/Tape and Reel Dimensions (For reference only. mm/[in])

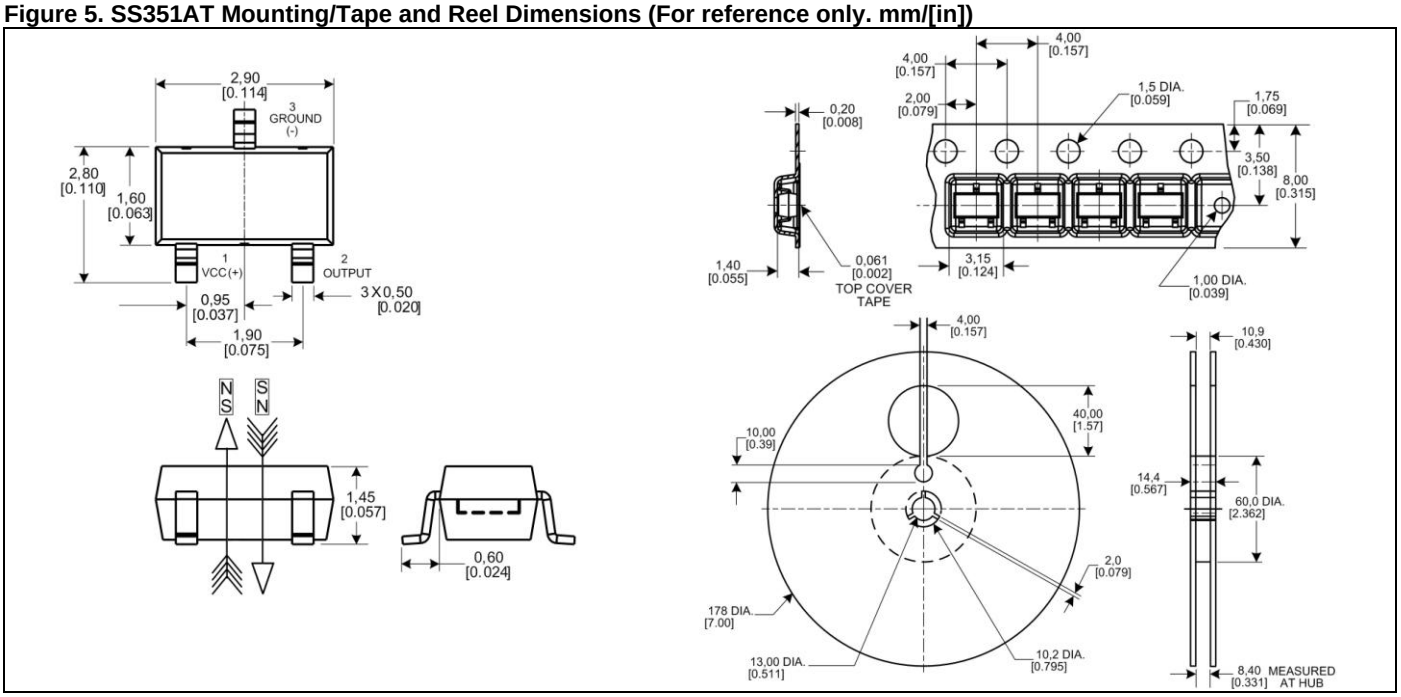
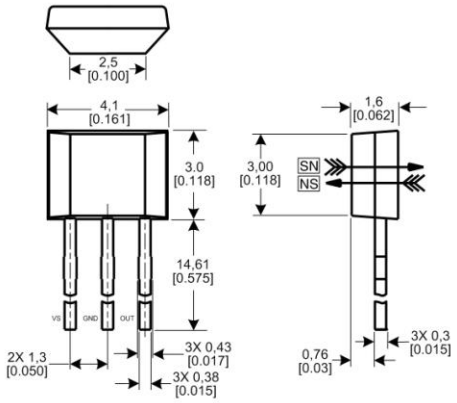


Figure 6. SS451A Mounting Dimensions (For reference only. mm/[in])



Order Guide

Catalog Listing	Description
SS351AT	Omnipolar, Hall-effect digital position sensor, SOT-23 package, tape and reel packaging (3000 units per reel)
SS451A	Omnipolar, Hall-effect digital position sensor, flat TO-92 package, bulk packaging (1000 units per bag)

⚠ 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.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement 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 it 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 we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer 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 printing. However, we assume no responsibility for its use.

⚠ 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.

SALES AND SERVICE

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