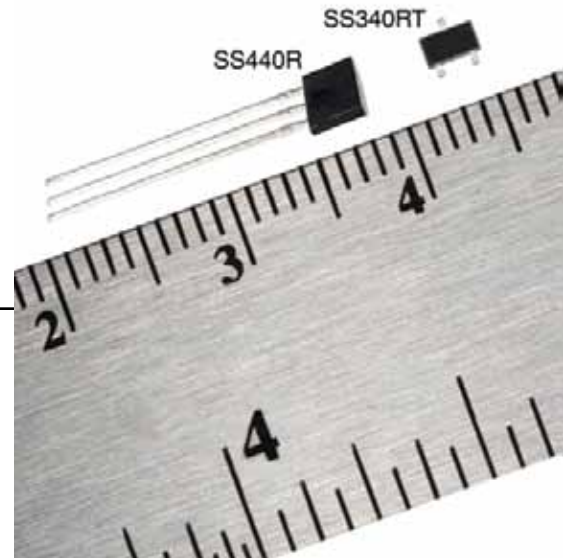


SS340RT/SS440R

Unipolar Digital Hall-Effect Sensor ICs



DESCRIPTION

The SS340RT/SS440R sensor ICs 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 single pole: North (SS340RT) or South (SS440R).

These unipolar Hall ICs are supplied in three different magnetic sensitivities to meet a wide range of potential applications:

- SS341RT and SS441R offer the highest sensitivity, with a typical operating point of 75 G at 25 °C [77 °F].
- SS343RT and SS443R offer medium sensitivity, with a typical operating point of 135 G at 25 °C [77 °F].
- SS349RT and SS449R offer the lowest sensitivity, with a typical operating point of 305 G at 25 °C [77 °F].

FEATURES AND BENEFITS

- **Subminiature package size (SS340RT) supplied on tape and reel:** Allows for a compact design with automated component placement, helping to reduce manufacturing costs
- **Simple activation from a single pole and multiple magnetic sensitivities (high, medium and low):** Make this product suitable in a variety of potential motion control, lid closure detection, and displacement sensing applications
- **Low voltage 3 V 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 °C to 150 °C [-40 °F to 302 °F]
- **RoHS-compliant materials:** Meet Directive 2002/95/EC

These sensors are available in two package styles:

- The SS340RT is available in the miniature SOT-23 surface mount package.
- SS440R is available in the leaded, flat TO-92-style package.

The SS340RT'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 SS340RT Series is available on tape and reel (3000 units per reel); the SS440R Series is available in a bulk package (1000 units per bag).

POTENTIAL APPLICATIONS

Industrial:

- Door or lid closure detection
- Speed and RPM (revolutions per minute) sensing in fitness equipment
- Flow rate sensing in industrial processes, appliances, and water softeners
- Damper or valve position control in industrial, HVAC and residential or commercial applications
- Robotic control (cylinder position monitoring)
- Float-based fluid level sensing
- Printer head position sensing

Medical:

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

SS340RT/SS440R

Table 1. SS340RT/SS440R Performance Specifications ($V_{\text{supply}} = 3 \text{ Vdc to } 24 \text{ Vdc}$, 20 mA I oad , $T_A = -40 \text{ }^\circ\text{C to } 150 \text{ }^\circ\text{C}$ [-40 °F to 302 °F] except where otherwise specified.)

Characteristic	Condition	Min.	Typ.	Max.	Unit	
Supply voltage:						
SS340RT	150 °C [302 °F]	3	–	12	Vdc	
SS340RT	-40 °C to 125 °C [-40 °F to 257 °F]	3	–	24		
SS440R	-40 °C to 150 °C [-40 °F to 302 °F]	3	–	24		
Supply current	$V_{\text{supply}} = 5 \text{ V at } 25 \text{ }^\circ\text{C [77 }^\circ\text{F]}$ $V_{\text{supply}} = 3 \text{ V at } 25 \text{ }^\circ\text{C [77 }^\circ\text{F]}$ –	– – –	4 3.5 –	6 5 8	mA	
Vsat	20 mA, Gauss >Bop	–	–	0.4		Vdc
Output leakage current	Gauss >Bop	–	–	10		µA
Output switching time:						
rise	$V_{\text{supply}} = 12 \text{ V at } 25 \text{ }^\circ\text{C [77 }^\circ\text{F]}$, $R_L = 1.6 \text{ k}\Omega$, $C_L = 20 \text{ pF}$	–	–	1.5	µs	
fall		–	–	1.5		
Thermal resistance:						
SS340RT (SOT-23)	–	–	303	–	°C/W	
SS440R (flat TO-92-style)	–	–	233	–		
Operate:						
SS341RT/SS441R	–	35	75	135	Gauss	
SS343RT/SS443R	–	45	135	205		
SS349RT/SS449R	–	240	305	460		
Release:						
SS341RT/SS441R	–	10	35	120	Gauss	
SS343RT/SS443R	–	40	85	180		
SS349RT/SS449R	–	135	225	370		
Differential:						
SS341RT/SS441R	–	5	40	80	Gauss	
SS343RT/SS443R	–	5	50	120		
SS349RT/SS449R	–	30	80	170		
Operating temperature	–	-40 [-40]	–	150 [302]	°C [°F]	
Storage temperature	–	-40 [-40]	–	150 [302]	°C [°F]	

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



Table 2. SS340RT/SS440R 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

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.

Unipolar Digital Hall-Effect Sensor ICs

Figure 1. Typical Magnetic Characteristics

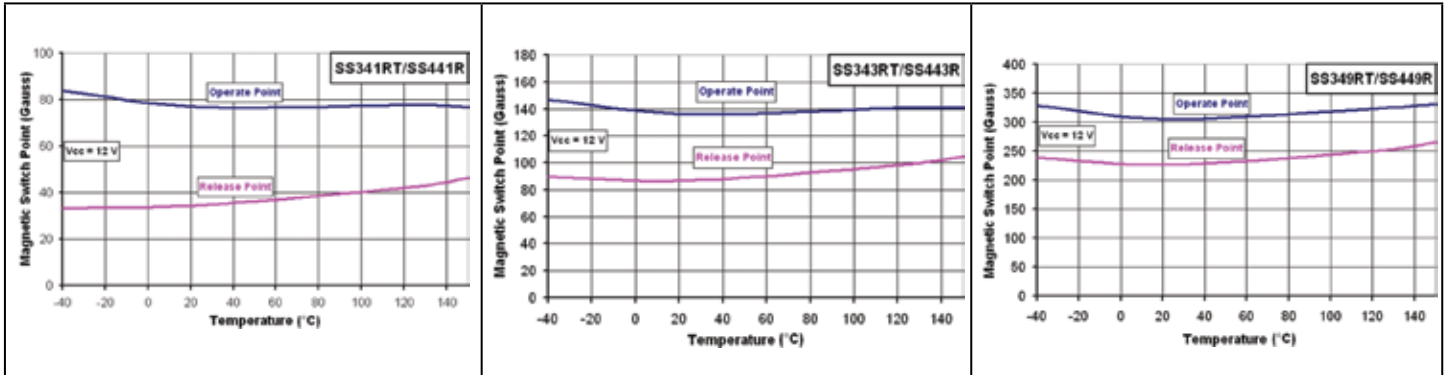


Figure 2. SS340RT Maximum Rated Supply Voltage vs Temperature

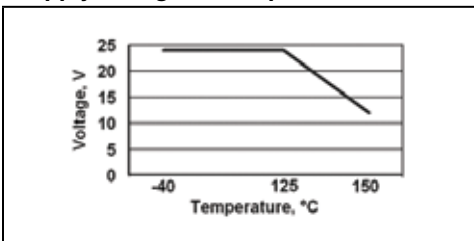


Figure 3. Current Sinking Output Block Diagram

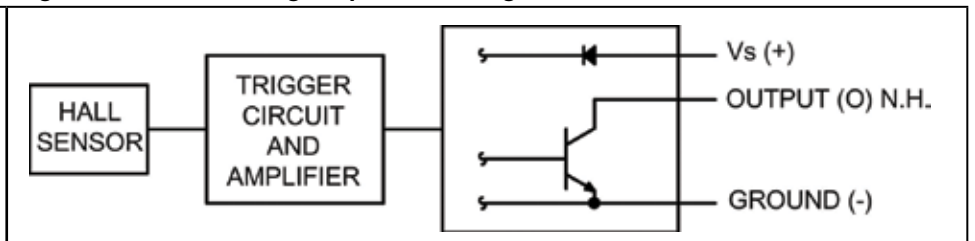
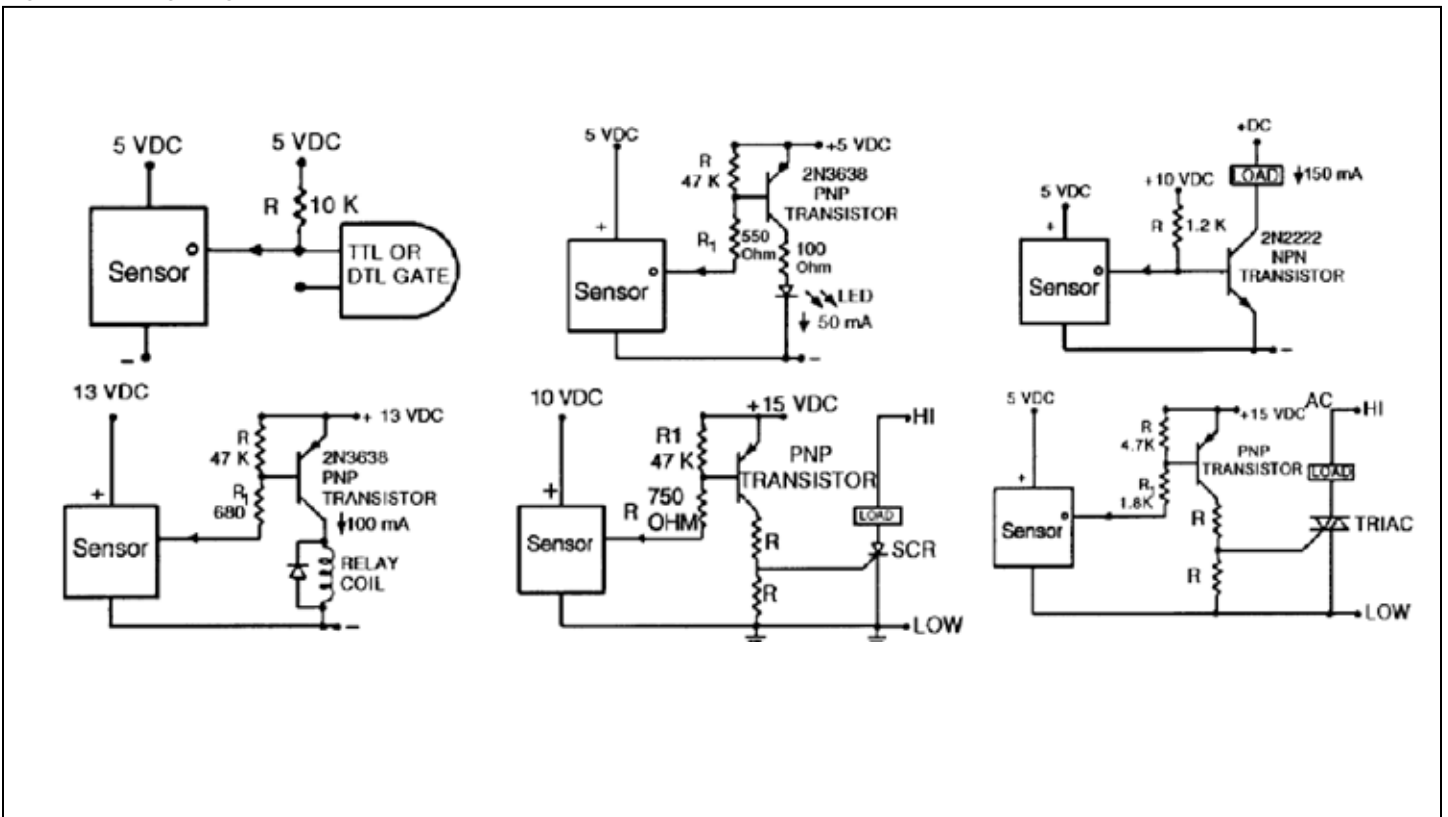


Figure 4. Wiring Diagrams



Order Guide

Catalog Listing	Description
SS341RT	SS340RT, unipolar, digital Hall-effect sensor IC, high sensitivity, SOT-23 package, tape and reel packaging (3000 units per reel)
SS343RT	SS340RT, unipolar, digital Hall-effect sensor IC, medium sensitivity, SOT-23 package, tape and reel packaging (3000 units per reel)
SS349RT	SS340RT, unipolar, digital Hall-effect sensor IC, low sensitivity, SOT-23 package, tape and reel packaging (3000 units per reel)
SS441R	SS440R, unipolar, digital Hall-effect sensor IC, high sensitivity, flat TO-92-style package, bulk packaging (1000 units per bag)
SS443R	SS440R, unipolar, digital Hall-effect sensor IC, medium sensitivity, flat TO-92-style package, bulk packaging (1000 units per bag)
SS449R	SS440R, unipolar, digital Hall-effect sensor IC, low sensitivity, flat TO-92-style 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

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 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 datasheet is for reference only. DO NOT USE this document as product installation information.
- 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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