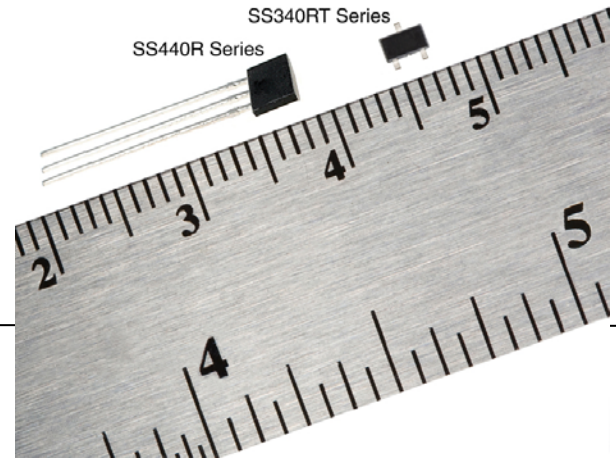


## SS340RT and SS440R Series

### Unipolar Hall-Effect Digital Position Sensors



#### DESCRIPTION

The SS340RT Series and SS440R Series 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 single pole: North (SS340RT Series) or South (SS440R Series).

These unipolar sensors are supplied in three different magnetic sensitivities to meet a wide range of potential applications. The SS341RT and SS441R offer the highest sensitivity, with a typical operating point of 85 G at 25 °C [77 °F]; the SS343RT and SS443R offer medium sensitivity with 125 G typical at 25 °C [77 °F]; the SS349RT and SS449R offer the lowest sensitivity, requiring 350 G typical to operate at 25 °C [77 °F].

These sensors are available in two package styles. The SS340RT Series is available in the miniature SOT-23 surface mount package; the 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 V 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).

#### FEATURES/BENEFITS

- Subminiature package size (SS340RT Series) 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, from -40 °C to 150 °C [-40 °F to 302 °F]
- RoHS-compliant materials meet Directive 2002/95/EC

#### POTENTIAL APPLICATIONS

- Door or lid closure detection
- Speed and RPM (revolutions per minute) sensing in fitness equipment
- Flow rate sensing in industrial processes, appliances, or water softeners
- Damper or valve position control in industrial, HVAC or residential or commercial applications
- Robotic control (cylinder position monitoring)
- Float-based fluid level sensing
- Displacement sensor in hospital beds or medical equipment
- Medication bin monitor on portable drug carts
- Printer head position sensing

# SS340RT and SS440R Series

**Table 1. SS340RT and SS440R Series Specifications (At  $V_s=3.0$  to 24 Vdc, 20 mA load,  $T_A = -40\text{ }^{\circ}\text{C}$  to  $150\text{ }^{\circ}\text{C}$  [ $-40\text{ }^{\circ}\text{F}$  to  $257\text{ }^{\circ}\text{F}$ ])**

| Characteristic                                                      | Condition                                                                                                                                                                                              | Minimum         | Typical          | Maximum           | Unit                                      |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-------------------|-------------------------------------------|
| Supply voltage: <sup>1</sup>                                        |                                                                                                                                                                                                        |                 |                  |                   |                                           |
| SS440R Series                                                       | $-40\text{ }^{\circ}\text{C}$ to $150\text{ }^{\circ}\text{C}$ [ $-40\text{ }^{\circ}\text{F}$ to $302\text{ }^{\circ}\text{F}$ ]                                                                      | 3               | —                | 24                | Vdc                                       |
| SS340RT Series                                                      | $-40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ [ $-40\text{ }^{\circ}\text{F}$ to $257\text{ }^{\circ}\text{F}$ ]                                                                      | 3               | —                | 24                |                                           |
| SS340RT Series                                                      | $150\text{ }^{\circ}\text{C}$ [ $302\text{ }^{\circ}\text{F}$ ]                                                                                                                                        | 3               | —                | 12                |                                           |
| Supply current                                                      | $V_{\text{supply}} = 5\text{ V}$ at $25\text{ }^{\circ}\text{C}$ [ $77\text{ }^{\circ}\text{F}$ ]<br>$V_{\text{supply}} = 3\text{ V}$ at $25\text{ }^{\circ}\text{C}$ [ $77\text{ }^{\circ}\text{F}$ ] | —<br>—<br>—     | 4<br>3.5<br>—    | 6<br>5<br>8       | mA                                        |
| $V_{\text{sat}}$                                                    | at 20 mA, gauss >Bop                                                                                                                                                                                   | —               | —                | 0.4               | Vdc                                       |
| Output leakage current                                              | gauss >Bop                                                                                                                                                                                             | —               | —                | 10                | $\mu\text{A}$                             |
| Output switching time:<br>rise<br>fall                              | $V_{\text{supply}} = 12\text{ V}$ at $25\text{ }^{\circ}\text{C}$ [ $77\text{ }^{\circ}\text{F}$ ],<br>$R_L = 1.6\text{ k}\Omega$ , $C_L = 20\text{ pF}$                                               | —<br>—          | —<br>—           | 1.5<br>1.5        | $\mu\text{s}$                             |
| Thermal resistance:<br>SS440R Series<br>SS340RT Series              | —                                                                                                                                                                                                      | —               | 233<br>303       | —                 | $^{\circ}\text{C/W}$                      |
| Operate:<br>SS341RT/SS441R<br>SS343RT/SS443R<br>SS349RT/SS449R      | —                                                                                                                                                                                                      | 35<br>45<br>240 | 85<br>125<br>350 | 135<br>205<br>460 | gauss                                     |
| Release:<br>SS341RT/SS441R<br>SS343RT/SS443R<br>SS349RT/SS449R      | —                                                                                                                                                                                                      | 10<br>40<br>135 | 50<br>90<br>250  | 120<br>180<br>370 | gauss                                     |
| Differential:<br>SS341RT/SS441R<br>SS343RT/SS443R<br>SS349RT/SS449R | —                                                                                                                                                                                                      | 5<br>5<br>30    | 35<br>35<br>100  | 80<br>120<br>170  | gauss                                     |
| Operating temperature                                               | —                                                                                                                                                                                                      | $-40$ [ $-40$ ] | —                | 150 [ $302$ ]     | $^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] |
| Storage temperature                                                 | —                                                                                                                                                                                                      | $-40$ [ $-40$ ] | —                | 150 [ $302$ ]     | $^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] |

**Note 1.** See Figure 1.

**Table 2. SS340RT and SS440R Series Absolute Maximum Ratings<sup>1</sup>**

| 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 |

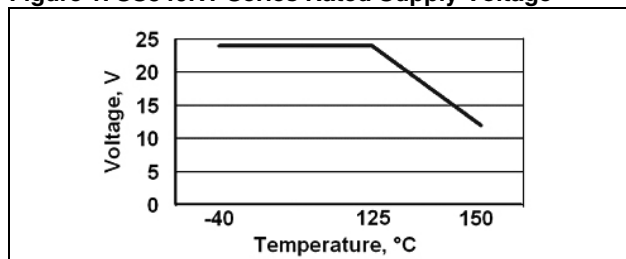
**Note 1:** The magnetic field strength (gauss) required to cause the switch to change state (operate and release) will be as specified in the magnetic characteristics. To test the switch against the specified magnetic characteristics, the switch must be placed in a uniform magnetic field.

## NOTICE

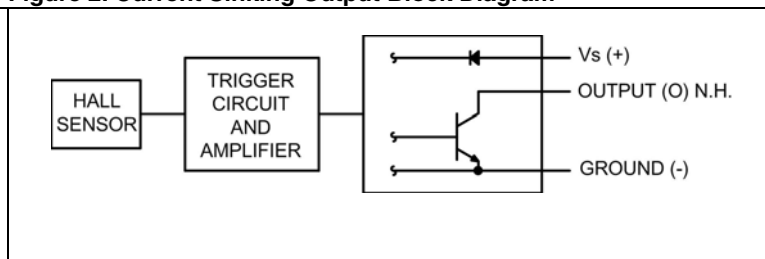
Absolute maximum ratings are the extreme limits that the device will withstand without damage to the device. However, the electrical and mechanical characteristics are not guaranteed as the maximum limits (above recommended operating conditions) are approached, nor will the device necessarily operate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



**Figure 1. SS340RT Series Rated Supply Voltage**



**Figure 2. Current Sinking Output Block Diagram**



# Unipolar Hall-Effect Digital Position Sensors

Figure 3. Wiring Diagrams

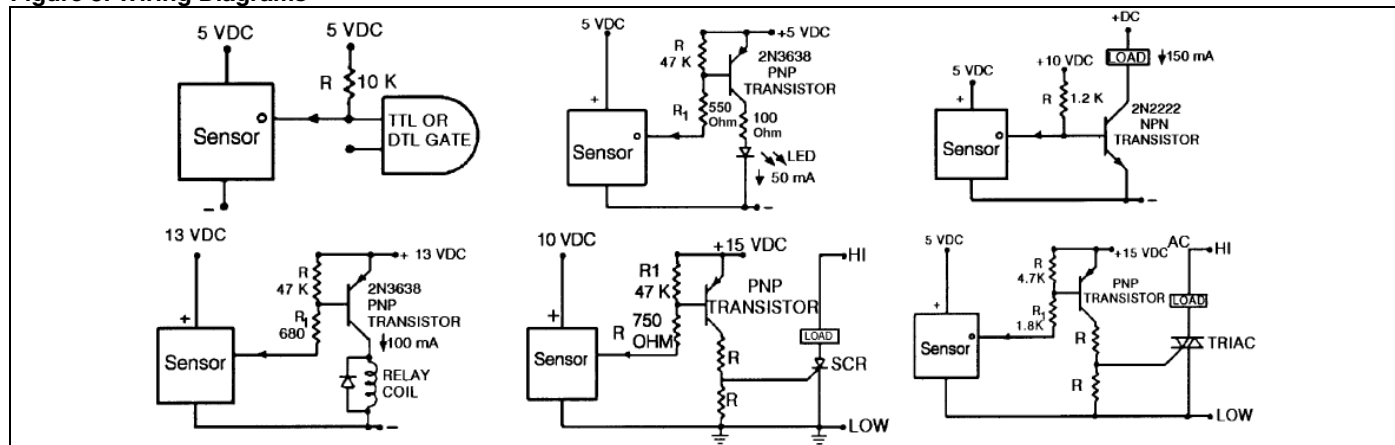


Figure 4. SS340RT Series Mounting/Tape and Reel Dimensions (For reference only. mm/[in])

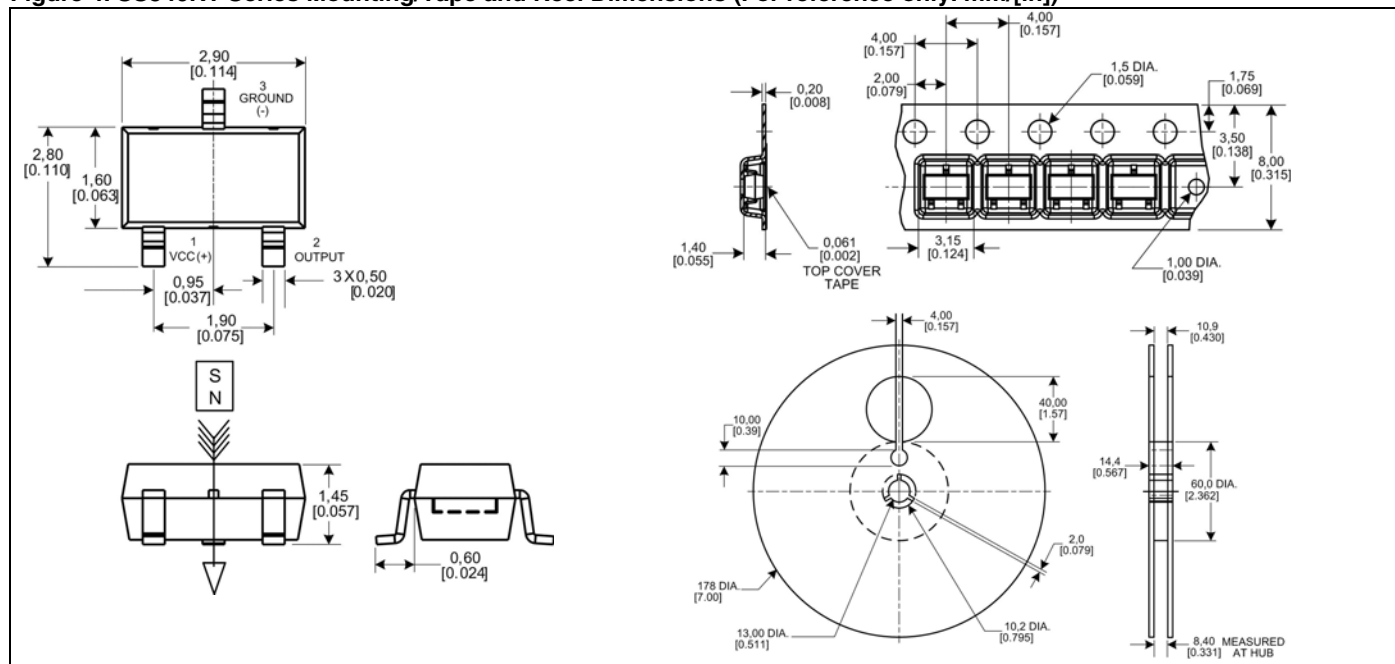
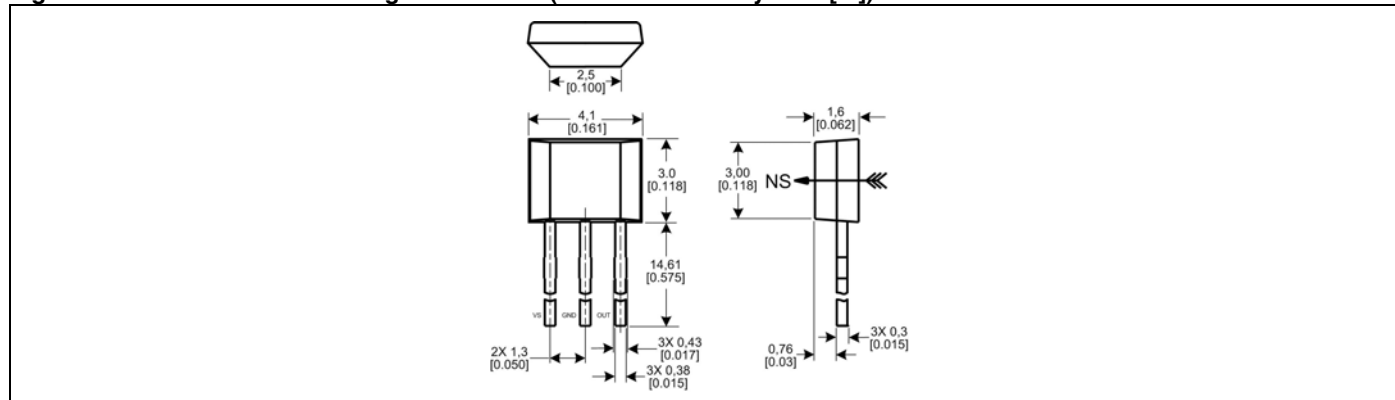


Figure 5. SS440R Series Mounting Dimensions (For reference only. mm/[in])



## Order Guide

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

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