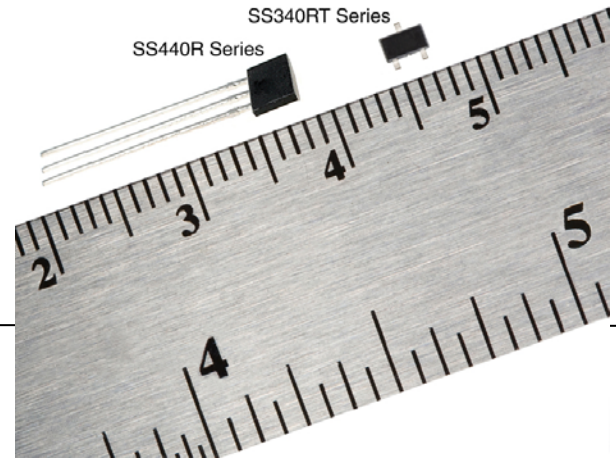


SS340RT and SS440R Series

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: ¹					
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 $25\text{ }^{\circ}\text{C}$ [$77\text{ }^{\circ}\text{F}$] $V_{\text{supply}} = 3\text{ V}$ at $25\text{ }^{\circ}\text{C}$ [$77\text{ }^{\circ}\text{F}$]	— — —	4 3.5 —	6 5 8	mA
V_{sat}	at 20 mA, gauss >Bop	—	—	0.4	Vdc
Output leakage current	gauss >Bop	—	—	10	μA
Output switching time: rise fall	$V_{\text{supply}} = 12\text{ V}$ at $25\text{ }^{\circ}\text{C}$ [$77\text{ }^{\circ}\text{F}$], $R_L = 1.6\text{ k}\Omega$, $C_L = 20\text{ pF}$	— —	— —	1.5 1.5	μs
Thermal resistance: SS440R Series SS340RT Series	—	—	233 303	—	$^{\circ}\text{C/W}$
Operate: SS341RT/SS441R SS343RT/SS443R SS349RT/SS449R	—	35 45 240	85 125 350	135 205 460	gauss
Release: SS341RT/SS441R SS343RT/SS443R SS349RT/SS449R	—	10 40 135	50 90 250	120 180 370	gauss
Differential: SS341RT/SS441R SS343RT/SS443R SS349RT/SS449R	—	5 5 30	35 35 100	80 120 170	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 Ratings¹

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

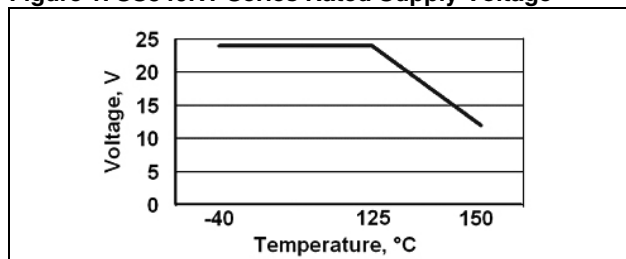


Figure 2. Current Sinking Output Block Diagram

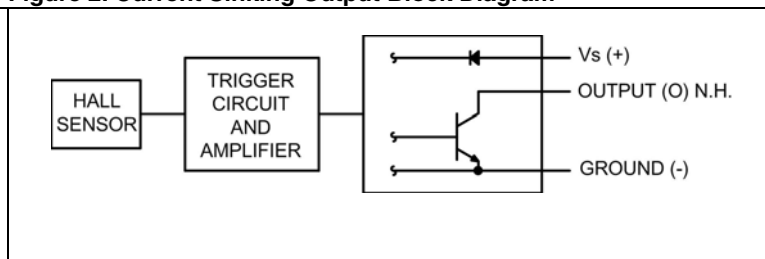


Figure 1 shows six circuit diagrams illustrating different sensor output configurations:

- Top Left:** A sensor connected to a TTL or DTL gate. The sensor output is connected to the input of the gate through a 10 K resistor. The sensor is powered by 5 VDC.
- Top Middle:** A sensor connected to an LED. The sensor output is connected to the base of a 2N3638 PNP transistor. The transistor's emitter is connected to +5 VDC, and its collector is connected to the LED. The LED is connected to ground. The sensor is powered by 5 VDC.
- Top Right:** A sensor connected to a load (LOAD) and a 150 mA current source. The sensor output is connected to the base of a 2N2222 NPN transistor. The transistor's emitter is connected to ground, and its collector is connected to the load. The load is connected to +10 VDC. The sensor is powered by 5 VDC.
- Bottom Left:** A sensor connected to a relay coil. The sensor output is connected to the base of a 2N3638 PNP transistor. The transistor's emitter is connected to +13 VDC, and its collector is connected to the relay coil. The relay coil is connected to ground. The sensor is powered by 13 VDC.
- Bottom Middle:** A sensor connected to a load (LOAD) and a TRIAC. The sensor output is connected to the base of a PNP transistor. The transistor's emitter is connected to +15 VDC, and its collector is connected to the load. The load is connected to ground. The sensor is powered by 10 VDC.
- Bottom Right:** A sensor connected to a load (LOAD) and a TRIAC. The sensor output is connected to the base of a PNP transistor. The transistor's emitter is connected to +15 VDC, and its collector is connected to the load. The load is connected to ground. The sensor is powered by 5 VDC.

[illegible]

Technical drawing of a microchip package showing top and side views with dimensions in mm and brackets indicating tolerances.

Top View Dimensions:

- Top Pad: 2.5 [0.100]
- Chip Body: 4.1 [0.161]
- Chip Body Height: 3.0 [0.118]
- Lead Length: 14.61 [0.575]
- Lead Spacing: 2X 1.3 [0.050]
- Lead Width: 3X 0.43 [0.017]
- Lead Thickness: 3X 0.38 [0.015]

Side View Dimensions:

- Lead Thickness: 0.76 [0.03]
- Lead Spacing: 3X 0.3 [0.015]
- Lead Length: 3.00 [0.118]
- Top Pad Width: 1.6 [0.062]
- Top Pad Thickness: NS

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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Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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