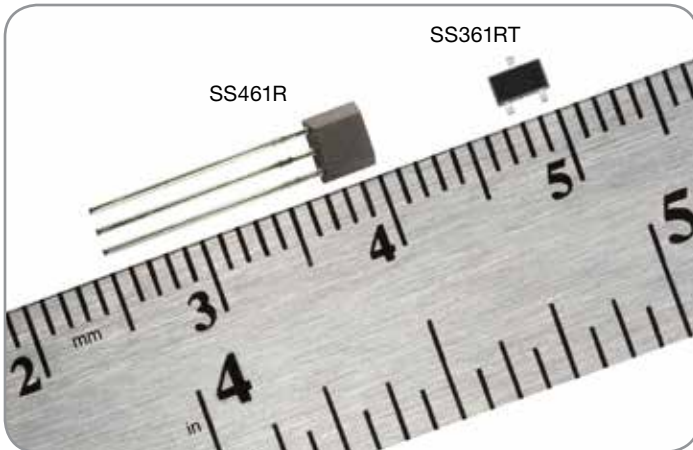


Latching Digital Hall-effect Sensor ICs: SS361RT, SS461R

005902
Issue 3

Datasheet



DESCRIPTION

The SS361RT and SS461R are small, versatile, digital Hall-effect sensor ICs that are operated by the magnetic field from a permanent magnet or an electromagnet, and designed to respond to alternating North and South poles. The SS361RT is turned on by a North pole while the SS461R is turned on by a South pole.

These latching digital Hall-effect sensor ICs have enhanced sensitivity of only 50 G typical, at 25°C [77 °F] that often allows for the use of less expensive magnets or wider air gaps. They offer a robust IC design with reverse polarity protection and 150 °C [302 °F] capability.

These product are available in two package styles:

- **SS361RT:** Subminiature SOT-23 surface-mount package on pocket tape and reel which allows for compact design with automated component placement.
- **SS461R:** Flat TO-92-style package with straight leads in bulk packaging which allows for a compact PC board layout.

FEATURES

- Latching magnetics
- Enhanced sensitivity
- Wide operating voltage range
- Built-in reverse voltage capability
- Robust design
- RoHS-compliant material meets directive 2002/95

POTENTIAL APPLICATIONS

Transportation

- Speed and RPM sensing
- Tachometer, counter pickup
- Motor and fan control
- Electronic window lift
- Convertible roof position
- Automotive transmission position

Industrial

- Speed and RPM sensing
- Tachometer, counter pickup
- Flow-rate sensing
- Brushless dc motor commutation
- Motor and fan control
- Robotics control

PORTFOLIO

The SS361RT and SS461R are part of Honeywell's family of Latching Digital hall-effect Sensor ICs, including:

- [SS360PT, SS460P, SS460P-T2](#)
- [SS360NT, SS360ST, SS360ST-10K SS460S, SS460S-T2](#)
- [SS361CT, SS461C](#)
- [SS46](#)
- [SS461A, SS466A](#)

Latching Digital Hall-effect Sensor ICs

SS361RT, SS461R

Table 1. Electrical and Environmental Specifications

(At $V_s = 3.0 \text{ Vdc}$ to 24.0 Vdc , 20 mA load, $T_A = -40 \text{ }^\circ\text{C}$ to $150 \text{ }^\circ\text{C}$ [$-40 \text{ }^\circ\text{F}$ to $302 \text{ }^\circ\text{F}$] except where otherwise specified.)

| Characteristic | Condition | Min. | Typ. | Max. | Unit |
|---|--|-------------------|------------------|----------------------|---------------------------------------|
| Supply voltage: SS361RT SS361RT SS461RT | 150 °C [302 °F] -40 °C to 125 °C [-40 °F to 257 °F] — | 3.0 3.0 3.0 | — — — | 12.0 24.0 24.0 | Vdc |
| Supply current | $V_{\text{supply}} = 3 \text{ Vdc}$ at 25 °C [77 °F] $V_{\text{supply}} = 5 \text{ Vdc}$ at 25 °C [77 °F] — | — — — | 3.5 4.0 — | 5.0 6.0 8.0 | mA |
| Output current | — | — | — | 20.0 | mA |
| V_{sat} | Gauss > 120 | — | — | 0.4 | V |
| Output leakage current | Gauss < -120 | — | — | 10.0 | μA |
| Rise/fall time | 25 °C [77 °F] | — | — | 1.5 | μs |
| Thermal resistance: SS361RT SS461R | single layer, single sided PCB — | — — | 303 233 | — — | $^\circ\text{C}/\text{W}$ |
| Magnetic characteristics: Operate (Bop) Release (Brp) Differential | — — — | 5 -120 50 | 50 -50 100 | 120 -5 170 | Gauss |
| Operating temperature | — | -40 [-40] | — | 150 [302] | $^\circ\text{C}$ [$^\circ\text{F}$] |
| Storage temperature | — | -40 [-40] | — | 150 [302] | $^\circ\text{C}$ [$^\circ\text{F}$] |
| Soldering temperature and time: SS361RT SS461RT | infrared reflow process: 245 °C [473 °F] for 10 s max. wave soldering process: 250 °C to 260 °C [482 °F to 500 °F] for 3 s max. | | | | |

NOTICE

These Hall-effect sensor ICs may have an initial output in either the ON or OFF state if powered up with an applied magnetic field in the differential zone (applied magnetic field >Brp and <Bop). Honeywell recommends allowing 10 μs after supply voltage has reached 5 V (SS361RT) or 3 V (SS461R) for the output voltage to stabilize.

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



Table 2. Absolute Maximum Specifications

| Characteristic | Min. | Typ. | Max. | Unit |
|------------------------|-------|------|----------|-------|
| Supply voltage | -28.0 | — | 28.0 | V |
| Applied output voltage | -0.5 | — | 28.0 | V |
| Output current | — | — | 20.0 | mA |
| Magnetic flux | — | — | no limit | Gauss |

NOTICE

Absolute maximum ratings are the extreme limits the device will momentarily withstand without damage to the device. Electrical and mechanical characteristics are not guaranteed if the specified voltage and/or currents are exceeded, nor will the device necessarily operate at absolute maximum ratings.

Latching Digital Hall-effect Sensor ICs SS361RT, SS461R

Figure 1. Typical Magnetic Characteristics vs Ambient Temperature at $V_{supply} = 12\text{ Vdc}$.

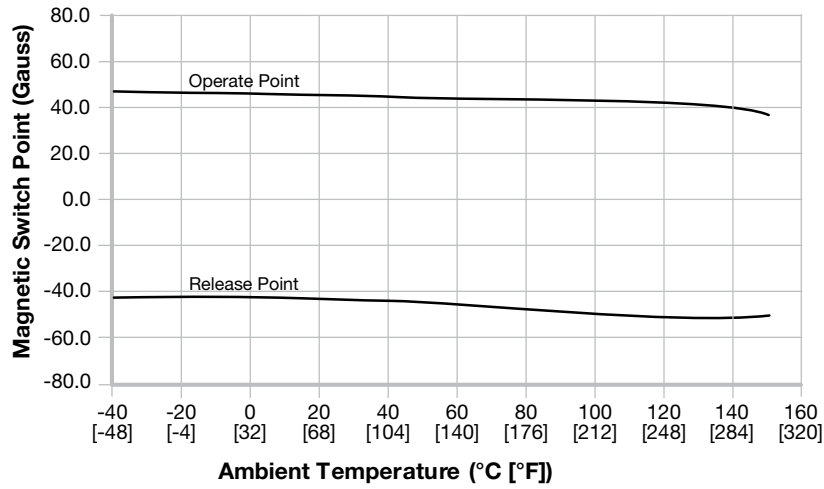


Figure 2. Current Sinking Output Block Diagram

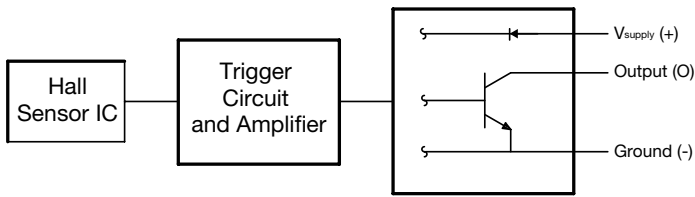


Figure 3. SS361RT Rated Supply Voltage

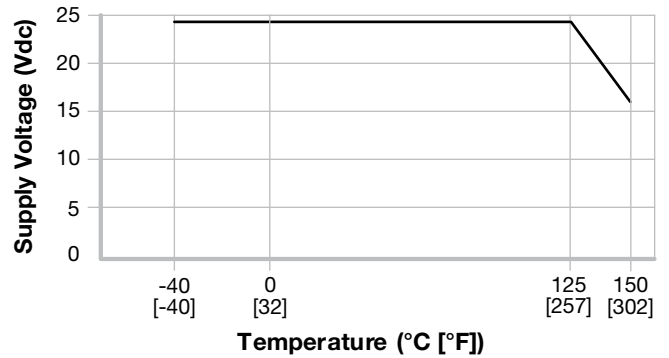


Figure 4. Magnetic Activation



Latching Digital Hall-effect Sensor ICs SS361RT, SS461R

Figure 6. SS461R Sensor IC Mounting Dimensions (For reference only. mm/in.)

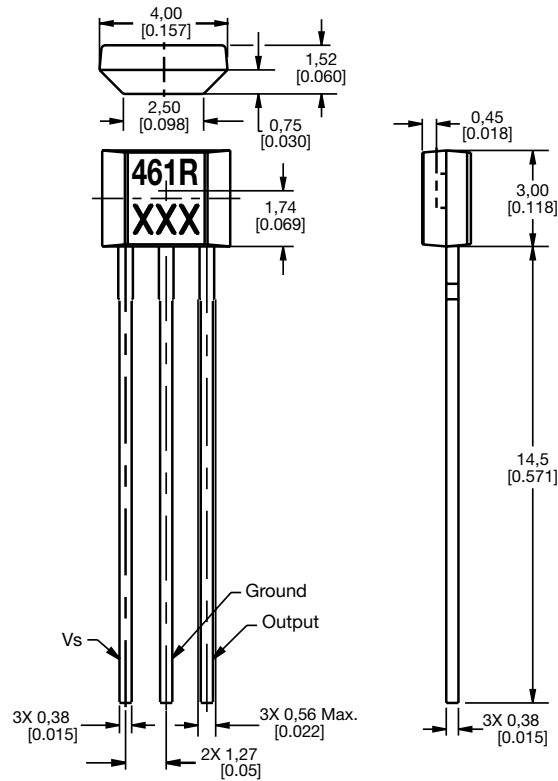




Table 3. Order Guide

| Catalog Listing | Description | |
|-----------------|--|---|
| SS361RT | Latching, digital Hall-effect sensor IC, North pole activated, SOT-23 package, tape and 178 mm [7 in] reel packaging (3000 units per reel) |  |
| SS461R | Latching, digital Hall-effect sensor IC, South pole activated, flat TO-92-style package, straight leads, bulk packaging (1000 units per bag) |  |

ADDITIONAL INFORMATION

The following associated literature is available on the Honeywell web site at sensing.honeywell.com:

- Product Range Guide
- Product Line Guide
- Product Installation Instructions
- Technical Information

⚠ 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.

⚠ WARNING **MISUSE OF DOCUMENTATION**

- The information presented in this datasheet 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.

Find out more

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