

## SS41F/SS41G

### Low-Cost Bipolar Hall-Effect Sensors



#### DESCRIPTION

The SS41F/SS41G Low-Cost Bipolar Hall-Effect sensors are small, versatile digital Hall-effect devices that are operated by the magnetic field from a permanent magnet or an electromagnet, and are designed to respond to alternating North and South poles.

A built-in regulator provides enhanced stability of operation over 4.5 Vdc to 24 Vdc supply voltage range, and internal circuitry is designed to prevent sensor damage in case the supply voltage polarity is accidentally reversed.

#### FEATURES

- Miniature construction: 3.0 mm x 4.0 mm [0.12 in x 0.16 in] plastic package
- Power consumption of only 5 mA max at 4.5 Vdc for energy efficiency
- Bipolar magnetics for ring magnet applications
- High speed: operates from 0 kHz to over 100 kHz
- Broad temperature range of -40 °C to 125 °C [-40 °F to 257 °F]
- Built-in reverse polarity protection

The open-collector sinking output voltage is easily interfaced with a wide variety of electronic circuits.

The SS41F is factory tested at 25 °C [77 °F] and the SS41G is factory tested at both 25 °C [77 °F] and 125 °C [257 °F].

Both products are designed for high volume applications.

#### POTENTIAL APPLICATIONS

- Speed and RPM (revolutions per minute) sensing
- Brushless dc (direct current) motor commutation
- Motor and fan control
- Tachometer, counter pickup
- Flow-rate sensing

# SS41F/SS41G

**TABLE 1. SS41F/SS41G ABSOLUTE MAXIMUM RATINGS\***

Characteristic	Minimum	Typical	Maximum	Unit
Supply voltage	-28	–	28	V
Applied output voltage	-0.5	–	28	V
Output current	–	–	20	mA
Magnetic flux	–	–	no limit	gauss

**Note:**

\*Absolute maximum ratings are the extreme limits the device is designed to 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.

**TABLE 2. SS41F SPECIFICATIONS (At Vs = 4.5 V to 24 V with 20 mA load with Ta = 25 °C [77 °F] unless otherwise noted.)**

Characteristic	Condition	Minimum	Typical	Maximum	Unit
Supply voltage	–	4.5	–	24.0	V
Supply current	–	–	6.8	10.0	mA
Output current	–	–	–	20.0	mA
Vsat at 15 mA	gauss >170	–	–	0.4	V
Output leakage	gauss <-170	–	–	1.0	µA
Rise time	Vs = 4.5 V	–	0.5	1.5	µs
Fall time	Vs = 4.5 V	–	0.2	1.5	µs
Operate (Bop)	–	–	4.0 (40)	15 (150)	mT (gauss)
Release (Brp)	–	-15 (-150)	-4.0 (-40)	–	mT (gauss)
Differential	–	4.0 (40)	–	–	mT (gauss)
Operating temperature	-40 °C to 150 °C [-40 °F to 302 °F]				
Storage temperature	-40 °C to 150 °C [-40 °F to 302 °F]				

**TABLE 3. SS41G SPECIFICATIONS (At Vs = 4.5 V to 24 V with 20 mA load with Ta = -40 °C to 150 °C [-40 °F to 302 °F] unless otherwise noted.)**

Characteristic	Condition	Minimum	Typical	Maximum	Unit
Supply voltage	–	4.5	–	24.0	V
Supply current	output OFF	–	6.8	10.0	mA
Supply current	output ON	–	–	11.3	mA
Output current	–	–	–	20.0	mA
Vsat at 20 mA	25 °C [77 °F], gauss >170	–	–	0.4	V
Output leakage	Vs = 24 V, gauss <-170	–	–	10.0	µA
Rise time	25 °C [77 °F]	–	0.5	1.5	µs
Fall time	25 °C [77 °F]	–	0.2	1.5	µs
Operate (Bop)	25 °C [77 °F]	–	4.0 (40)	15 (150)	mT (gauss)
Operate (Bop)	–	–	–	25 (250)	mT (gauss)
Release (Brp)	25 °C [77 °F]	-14 (-140)	-4.0 (-40)	–	mT (gauss)
Release (Brp)	–	-25 (-250)	–	–	mT (gauss)
Differential	–	4.0 (40)	–	–	mT (gauss)
Operating temperature	-40 °C to 150 °C [-40 °F to 302 °F]				
Storage temperature	-40 °C to 150 °C [-40 °F to 302 °F]				

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FIGURE 1. SS41F/SS41G CURRENT SINKING OUTPUT DIAGRAM

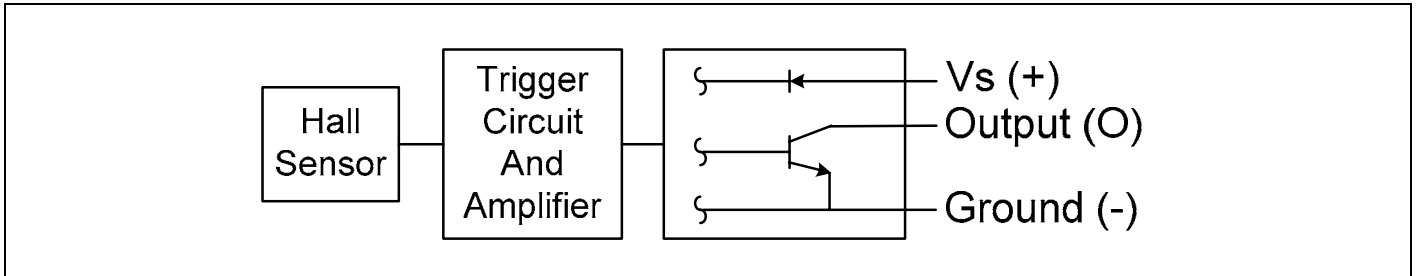
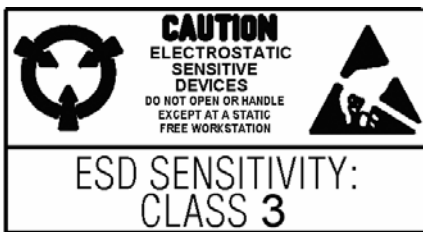
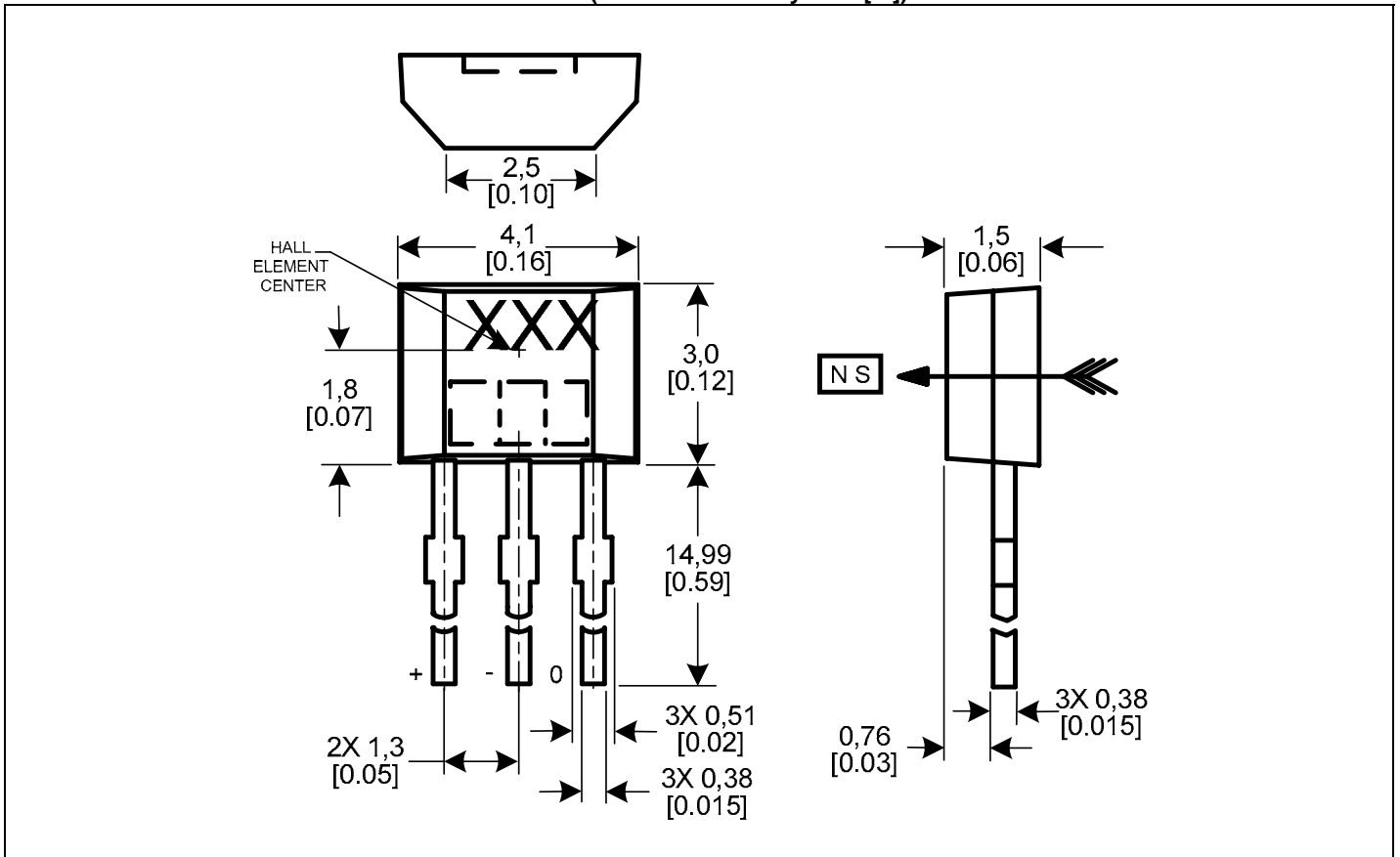


FIGURE 2. SS41F/SS41G MOUNTING DIMENSIONS (For reference only. mm/[in])



## ORDER GUIDE

Catalog Listing	Description
SS41F	Low-cost bipolar hall-effect sensor, tested at 25 °C [77 °F], standard bulk pack with 1000 units per bag
SS41G	Low-cost bipolar hall-effect sensor, tested at 25 °C [77 °F] and 125 °C [257 °F], standard bulk pack with 1000 units per bag

### 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.**

### 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

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**Internet:** [www.honeywell.com/sensing](http://www.honeywell.com/sensing)

#### Phone and Fax:

Asia Pacific	+65 6355-2828 +65 6445-3033 Fax
Europe	+44 (0) 1698 481481 +44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188 +1-305-883-8257 Fax
USA/Canada	+1-800-537-6945 +1-815-235-6847 +1-815-235-6545 Fax

Sensing and Control  
Honeywell  
1985 Douglas Drive North  
Minneapolis, MN 55422  
[www.honeywell.com/sensing](http://www.honeywell.com/sensing)

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