

Installation Instructions for the High Sensitivity Latching Digital Hall-effect Sensor ICs: VF360NT, VF360ST, VF460S

32311086

Issue D

GENERAL INFORMATION

CAUTION ELECTROSTATIC DISCHARGE DAMAGE

Ensure proper ESD precautions are followed when handling this product. **Failure to comply with these instructions may result in product damage.**



- **Surface mount (VF360NT, VF360ST):** Use infrared reflow process with active flux, lead-free solder. Do not exceed peak temperature of 245°C [473°F] for a maximum of 10 seconds.
- **Through-hole leads (VF460S):** Wave solder at 250°C to 260°C [482°F to 500°F] for a maximum of three seconds. Burrs are allowed only if full lead length will pass through a 0,68 mm [0.027 in] dia. hole.

SOLDERING AND ASSEMBLY

CAUTION IMPROPER SOLDERING

- Ensure leads are adequately supported during any forming/shearing operation so that they are not stressed inside the plastic case.
 - Limit exposure to high temperatures.
- Failure to comply with these instructions may result in product damage.**

CLEANING

CAUTION IMPROPER CLEANING

Do not use pressure wash. High-pressure stream could force contaminants into the package. **Failure to comply with these instructions may result in product damage.**

Use agitated rinse to clean the sensor.

Table 1. Electrical and Environmental Specifications
(At $V_s = 3.0$ Vdc to 24.0 Vdc, 20 mA load, $T_A = -40^\circ\text{C}$ to 150°C [-40°F to 302°F] except where otherwise specified.)

Characteristic	Condition	Min.	Typ.	Max.	Unit
Supply voltage: VF360NT, VF360ST VF360NT, VF360ST VF460S	-40°C to 125°C [-40°F to 257°F] 150°C [302°F] —	3.0 3.0 3.0	— — —	24.0 12.0 24.0	Vdc
Supply current	$V_{\text{supply}} = 3.0$ Vdc at 25°C [77°F] —	— —	3.5 —	6.0 8.0	mA
Output current	—	—	—	20.0	mA
V_{sat}	Gauss > 55	—	—	0.6	V
Output leakage current	Gauss > -55	—	—	10.0	μA
Rise/fall time	25°C [77°F]	—	—	1.5	μs
Thermal resistance: VF360NT, VF360ST VF460S	single layer, single sided PCB —	— —	303 233	— —	°C/W
Magnetic characteristics: operate (Bop) operate (Bop) release (Brp) release (Brp) differential	25°C [77°F] — 25°C [77°F] — —	15 5 -45 -55 40	30 30 -30 -30 60	45 55 -15 -5 80	Gauss
Operating temperature	—	-40 [-40]	—	150 [302]	°C [°F]
Storage temperature: VF360NT, VF360ST VF460S	— —	-40 [-40] -40 [-40]	— —	150 [302] 165 [239]	°C [°F]
ESD (Human Body Model)	per JEDEC JS-001, Class H3A/3A	-4	—	+4	kV
Soldering temperature and time: VF360NT, VF360ST VF460S	infrared reflow: peak temperatures not to exceed 245°C [473°F] for 10 s max. PCB wave soldering: 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 (VF360NT, VF360ST) or 3 V (VF460S) 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	-26.0	—	26.0	V
Applied output voltage	-0.5	—	26.0	V
Output current	—	—	25	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 rated voltage and/or currents are exceeded, nor will the device necessarily operate at absolute maximum ratings.

Figure 1. Sensor IC Block Diagram

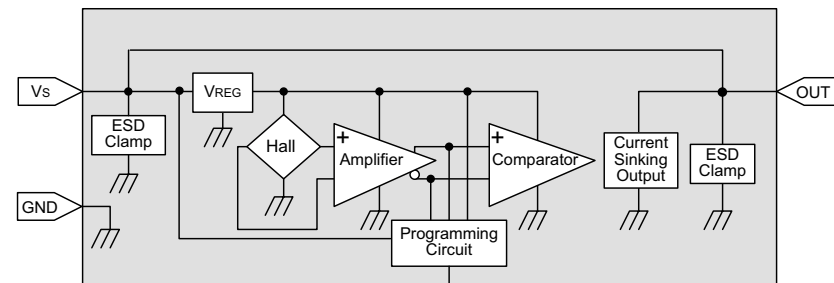


Figure 2. Typical Magnetic Characteristics vs Ambient Temperature at Supply Voltages

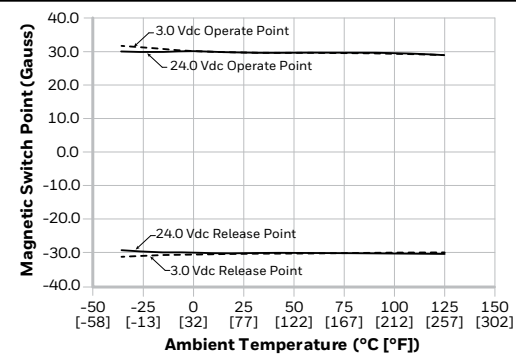


Figure 3. VF360NT, VF360ST Rated Supply Voltage vs Temperature

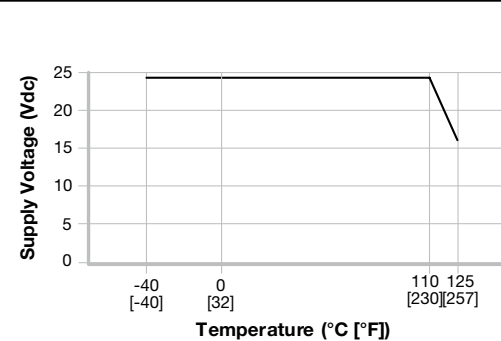


Figure 4. Magnetic Activation

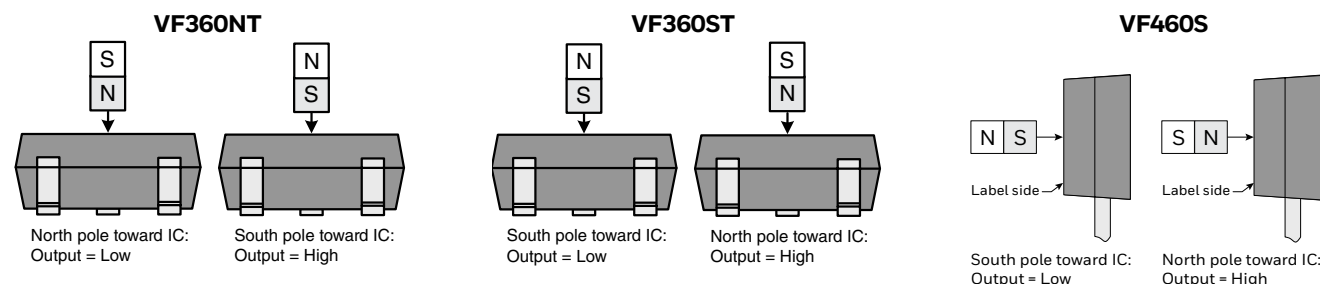
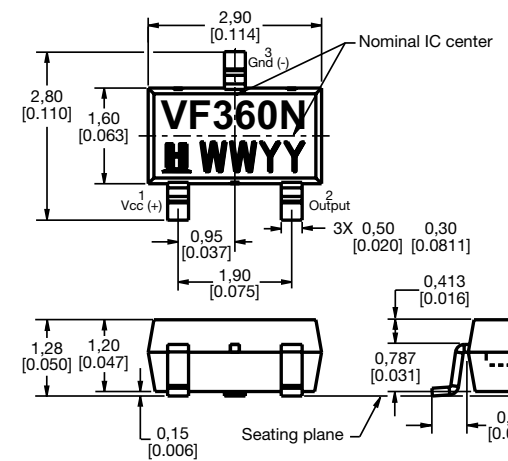
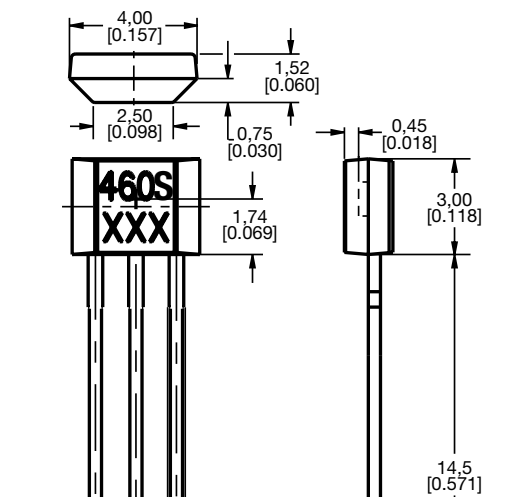


Figure 5. Sensor IC, Tape and Reel Mounting Dimensions (For reference only. mm/in)

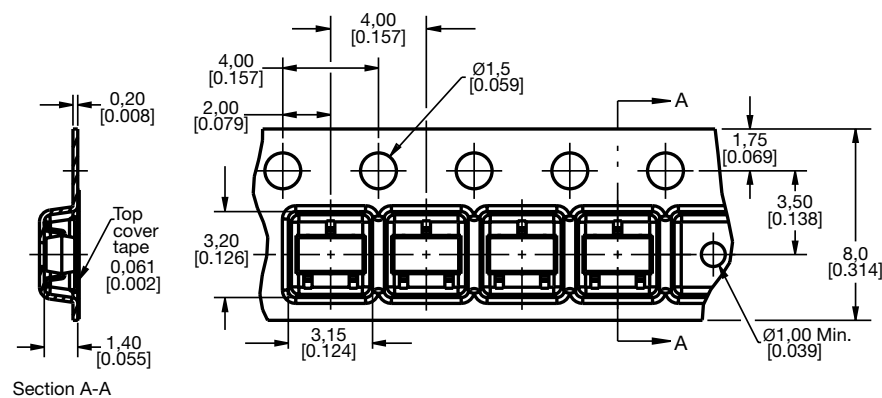
VF360NT, VF360ST Sensor IC



VF460S Sensor IC

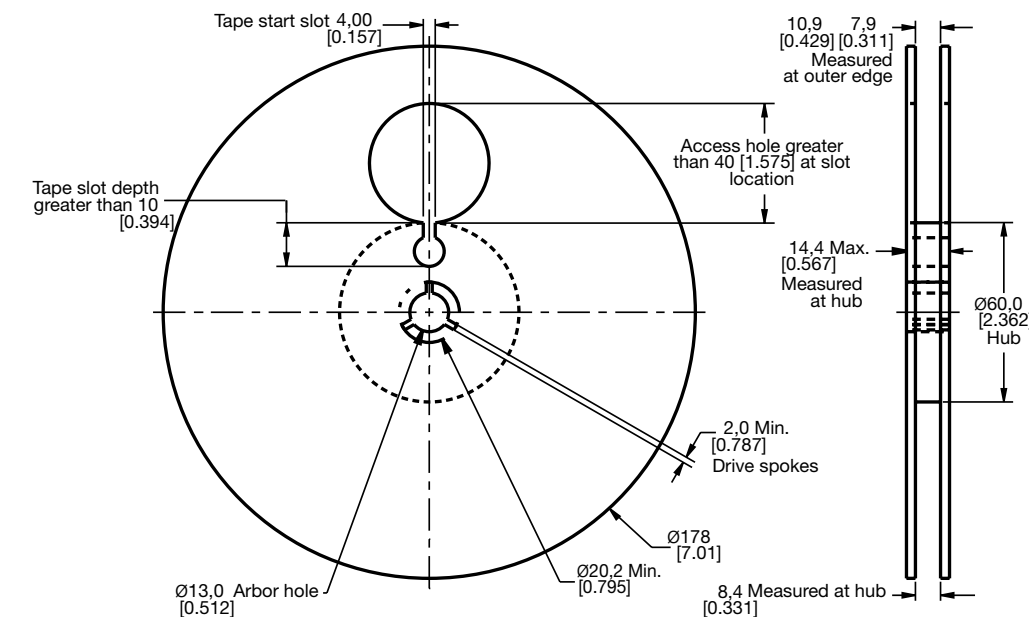


VF360NT, VF360ST Pocket Tape



Section A-A

VF360NT, VF360ST Reel



Note: Ensure the minimum hole size in the PCB is 0.68 mm [0.027] dia. based on the IPC 2222 Level B standard.

**⚠ 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 during the applicable warranty period. 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 that Honeywell, in its sole discretion, finds defective.

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