Honeywell

Installation Instructions for the SL353 Series Micropower Omnipolar Digital Sensor ICs

50061206
Rev. B

GENERAL INFORMATION

CAUTION
ELECTROSTATIC DISCHARGE DAMAGE
This component is sensitive to electrostatic discharge (ESD). Take normal ESD precautions in handling this product to prevent ESD-induced damage and/or degradation.
Failure to comply with these instructions may result in product damage.



SOLDERING/ASSEMBLY

CAUTION
PRODUCT DAMAGE
- 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.
- Do not wave solder.

Failure to comply with these instructions may result in product damage.

Use an infrared reflow process with temperatures of 245 °C [473 °F] peak for 10 s max.

Table 1. Absolute Maximum Ratings

Characteristic	Condition	Min.	Typ.	Max.	Unit
Supply voltage	—	-0.5	—	6	V
Operating temperature	ambient	-40 [-40]	—	150 [302]	°C [°F]
Soldering temperature	applied for <10 s	—	—	265 [509]	°C [°F]
Load current	—	—	—	5	mA

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 necessary operate at absolute maximum ratings.

Figure 1. Block/Electrical Diagram

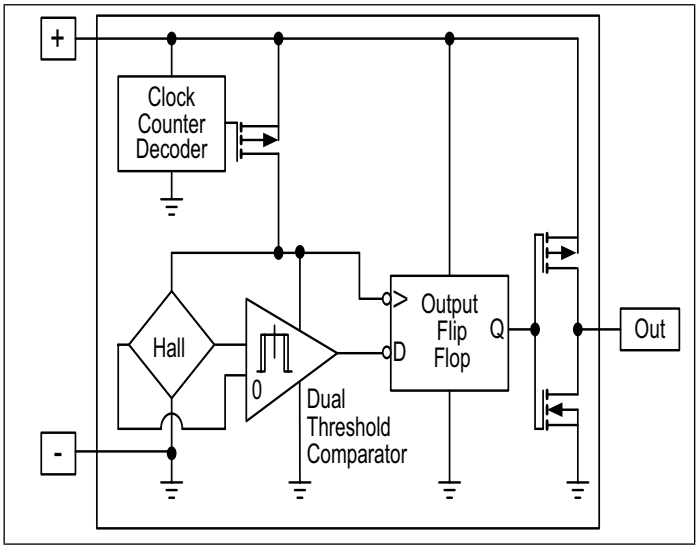


Table 2. Magnetic Characteristics for SL353 Series (2.2 V ≤ Vs ≤ 5.5 V, -40 °C [-40 °F] ≤ Ta ≤ 85 °C [185 °F])

Characteristic	Condition	Min.	Typ.	Max.	Unit
Operate point:					
positive	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	20	60	110	Gauss
negative	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F	-110	-60	-20	
Release point:					
positive	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	5	45	95	Gauss
negative	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F	-95	-45	-5	
Hysteresis	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	3	15	60	Gauss

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

Table 3. Electrical and Environmental Characteristics for SL353 Series
(At 2.2 V ≤ Vs ≤ 5.5 V, -40 °C [-40 °C] ≤ Ta ≤ 85 °C [185 °F] and Vs = 2.8 V, Ta = 25 °C [77 °F] unless otherwise specified.)

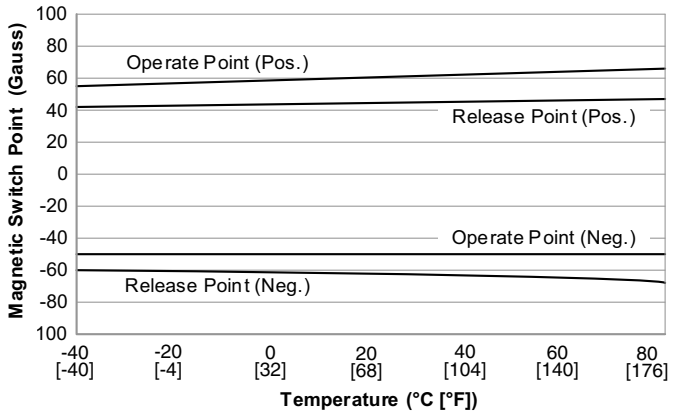
Characteristic	Condition	Min.	Typ.	Max.	Unit
Supply voltage (Vs)	Ta = -40 °C to 85 °C [-40 °F to 185 °F]	2.2	2.8	5.5	V
Active mode current	Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	— —	2.5 2.5	4 9	mA
Sleep mode current	Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	— —	1.5 1.5	2.5 8	µA
Average current: SL353HT SL353HT SL353LT SL353LT	 Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F] Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	 — — — —	 0. 33 0.33 1.8 1.8	 0.64 2.3 3 9	 mA mA µA µA
Active mode time	Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	3 3	6 6	9 30	µs
Period: SL353HT SL353HT SL353LT SL353LT	 Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F] Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	 30 20 30 20	 45 45 45 45	 80 150 80 150	 µs µs ms ms
Duty cycle: SL353HT SL353HT SL353LT SL353LT	 Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F] Vs = 2.8 V, Ta = 25 °C [77 °F] Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	 10 5 0.01 0.005	 13 13 0.013 0.013	 16 25 0.016 0.025	 %
Vout: high high low low	 Vs = 2.8 V, Ta = 25 °C [77 °F], load current = 100 µA Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F], load current = 100 µA Vs = 2.8 V, Ta = 25 °C [77 °F], load current = 100 µA Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F], load current = 100 µA	 Vs - 0.15 Vs - 0.25 — —	 Vs - 0.11 Vs - 0.11 0.11 0.11	 — — 0.15 0.25	 V
Operating temperature	Vs = 2.2 V to 5.5 V, Ta = -40 °C to 85 °C [-40 °F to 185 °F]	-40 [-40]	—	85 [185]	°C [°F]
Storage temperature	—	-40 [-40]	—	150 [302]	°C [°F]

NOTICE

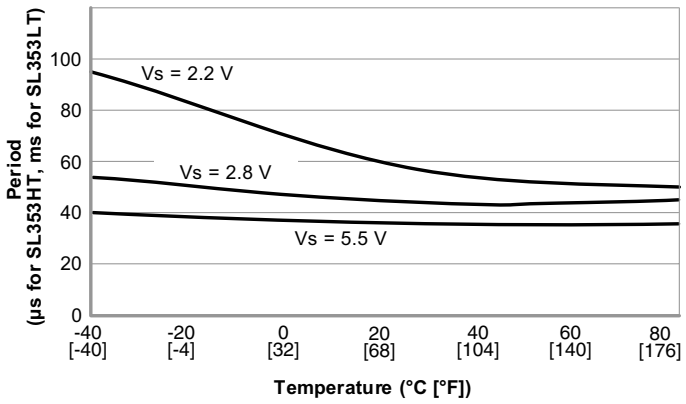
- These Hall-effect sensors ICs may have an initial output in either the on or off state if powered up with an applied magnetic field in the differential zone (applied magnetic field > Brp and < Bop). Honeywell recommends that the application circuit designer allow 10 µs after apply voltage has reached its rated value for the output voltage to stabilize.
- The sensor will turn LOW when the magnetic field is present and switch to HIGH when the field is removed. The sensor will latch and hold the state during the sleep “mode”.

Figure 2. Typical Performance Characteristics

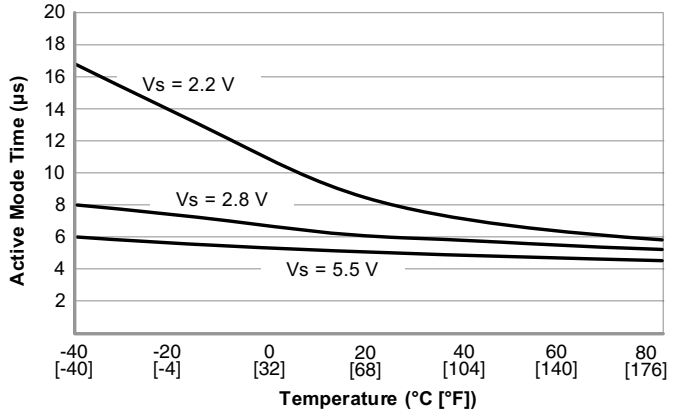
SL353HT and SL353LT Typical Magnetic Performance vs Temperature



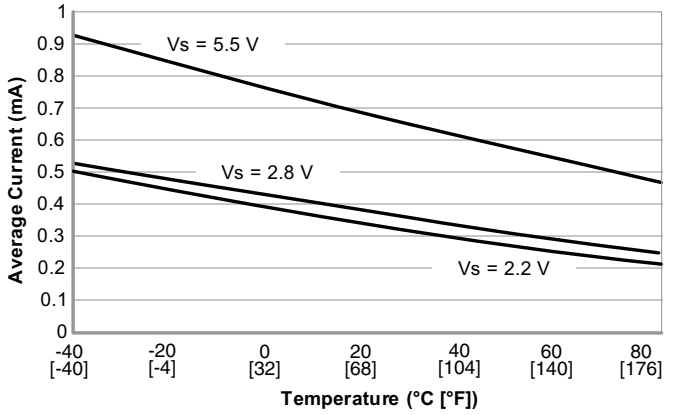
SL353HT and SL353LT Typical Period vs Temperature



SL353HT and SL353LT Typical Actve Mode Time vs Temperature



SL353HT Typical Average Current vs Temperature



SL353LT Typical Average Current vs Temperature

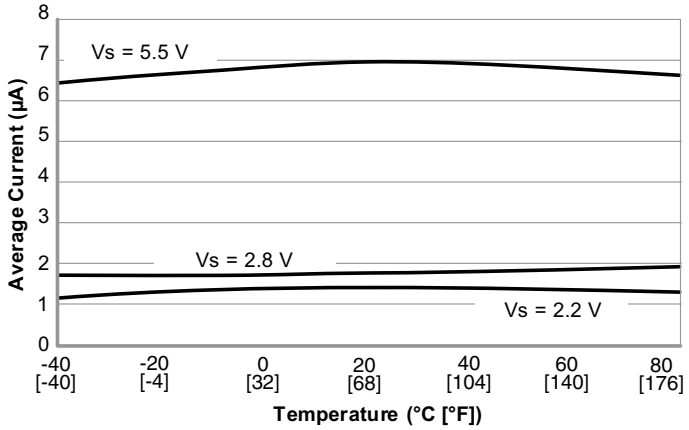
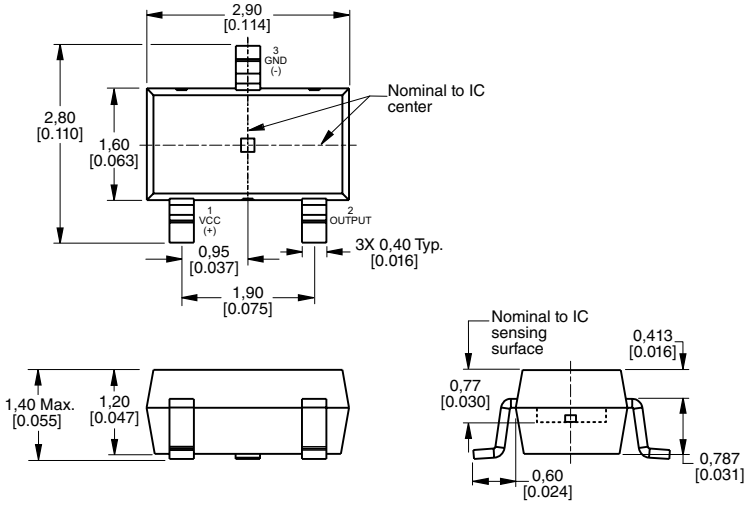
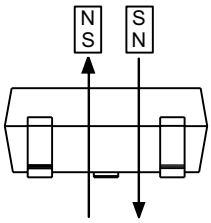


Figure 3. Mounting and Tape/Reel Dimensions (For reference only. mm/[in].)

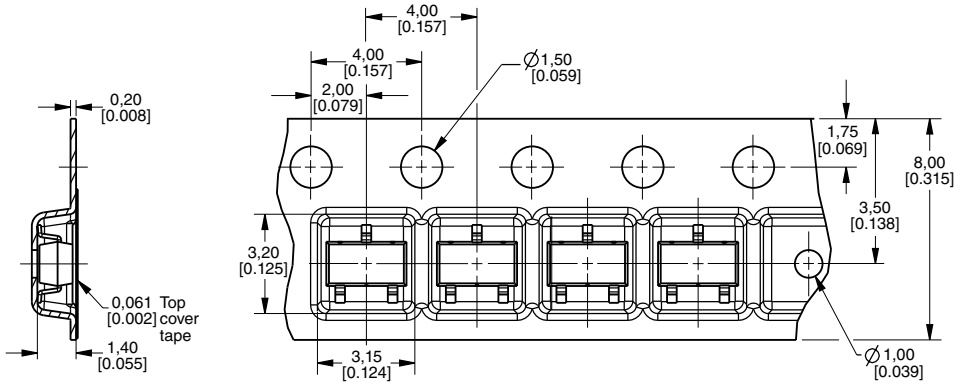
Sensor



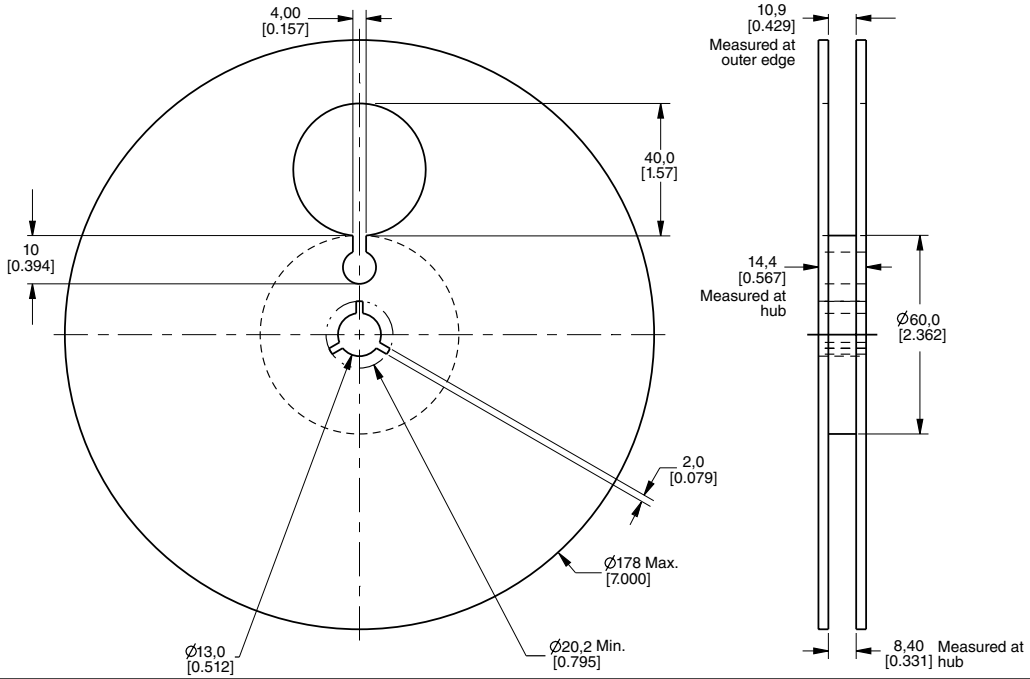
Sensor Showing Polarity



Tape



Reel



SL353 Series Macropower Omnipolar Digital Hall-Effect Sensor ICs

Rev. B

50061206

⚠ 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.**

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