

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

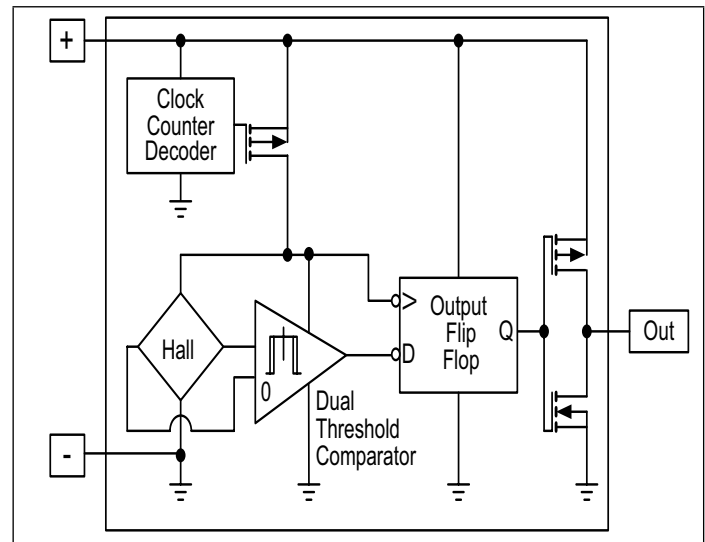


Table 2. Magnetic Characteristics for SL353 Series ($2.2\text{ V} \leq V_s \leq 5.5\text{ V}$, $-40\text{ °C} [-40\text{ °F}] \leq T_a \leq 85\text{ °C} [185\text{ °F}]$)

Characteristic	Condition	Min.	Typ.	Max.	Unit
Operate point: positive negative	$V_s = 2.2\text{ V to } 5.5\text{ V}$, $T_a = -40\text{ °C to } 85\text{ °C} [-40\text{ °F to } 185\text{ °F}]$ $V_s = 2.2\text{ V to } 5.5\text{ V}$, $T_a = -40\text{ °C to } 85\text{ °C} [-40\text{ °F to } 185\text{ °F}]$	20 -110	60 -60	110 -20	Gauss
Release point: positive negative	$V_s = 2.2\text{ V to } 5.5\text{ V}$, $T_a = -40\text{ °C to } 85\text{ °C} [-40\text{ °F to } 185\text{ °F}]$ $V_s = 2.2\text{ V to } 5.5\text{ V}$, $T_a = -40\text{ °C to } 85\text{ °C} [-40\text{ °F to } 185\text{ °F}]$	5 -95	45 -45	95 -5	Gauss
Hysteresis	$V_s = 2.2\text{ V to } 5.5\text{ V}$, $T_a = -40\text{ °C to } 85\text{ °C} [-40\text{ °F to } 185\text{ °F}]$	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.

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

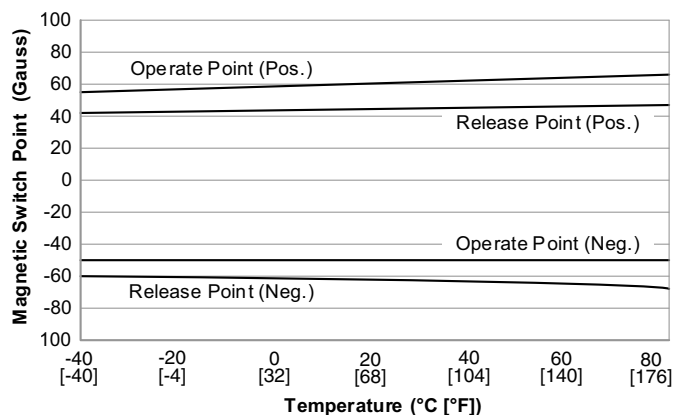
- These Hall-effect sensors ICs may have an initial output in either the on or off state if powered up with an applied magnetic field in the differential zone (applied magnetic field > Brp and < Bop). Honeywell recommends that the application circuit designer allow 10 μs after apply voltage has reached 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".

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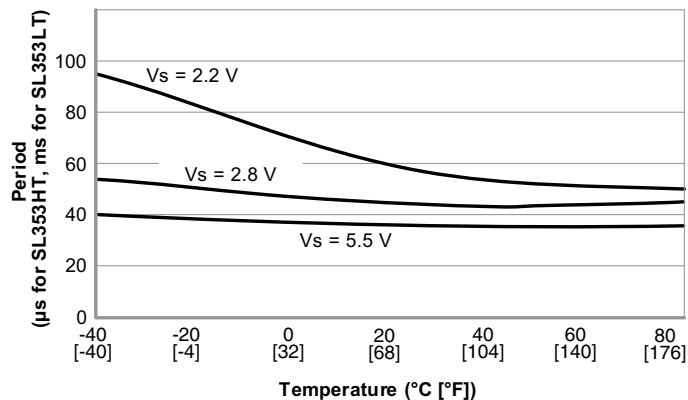
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Figure 2. Typical Performance Characteristics

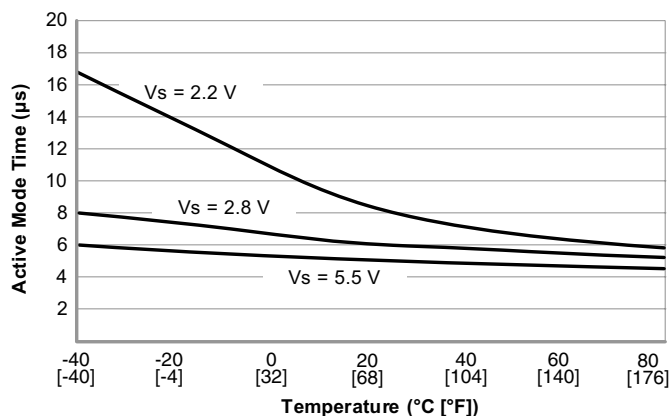
SL353HT and SL353LT Typical Magnetic Performance vs Temperature



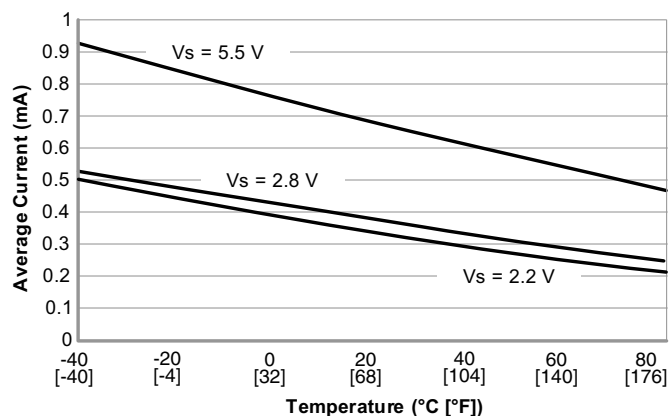
SL353HT and SL353LT Typical Period vs Temperature



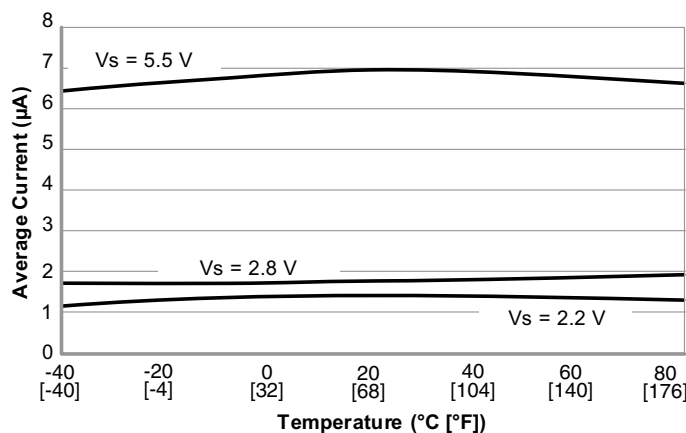
SL353HT and SL353LT Typical Active Mode Time vs Temperature



SL353HT Typical Average Current vs Temperature



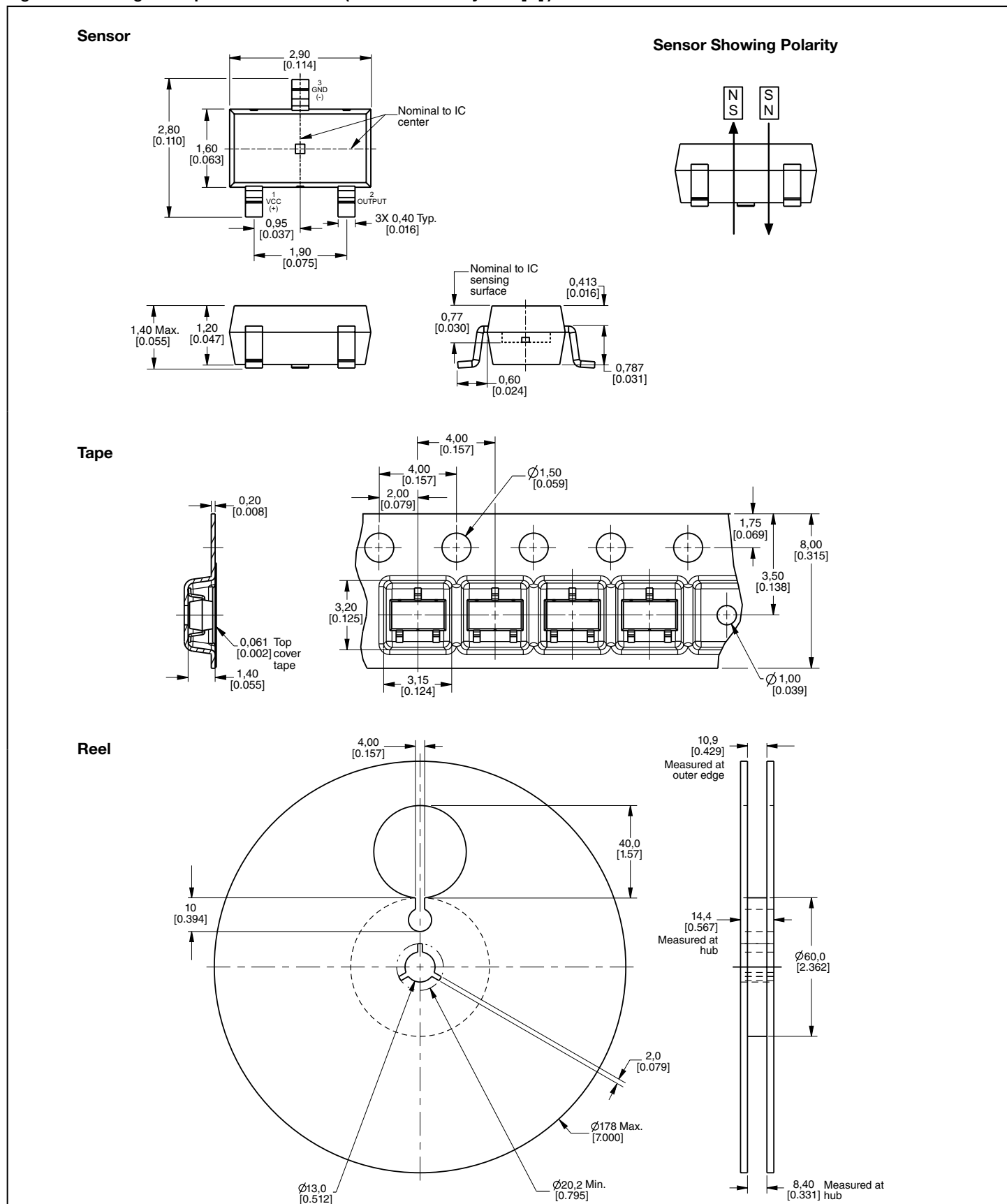
SL353LT Typical Average Current vs Temperature



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



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⚠ 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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