Honeywell

Micropower Omnipolar Digital Hall-effect Sensor ICs

SL351 LT

Datasheet

Micropower Omnipolar Digital Hall-effect Sensor ICs

Micropower Omnipolar Digital Hall-effect Sensor ICs, SL351LT is small, and versatile, digital Hall-effect device operated by the magnetic field from a permanent magnet or an electromagnet. These sensitive devices are designed to meet a wide range of potential applications with low power requirements including battery-operated equipment.

The SL351LT devices respond to either a North or South Pole, meaning that they do not require the magnet polarity to be identified, providing an easier installation and potentially reducing system cost.

These low-power sensing devices use BiCMOS (Bipolar Complementary Metal Oxide Semiconductor) technology and a timing circuit that turns the power on for only a short time – it is off for the rest of the period (duty cycle) – significantly reducing the average current consumption.

Micropower Omnipolar digital Hall-effect sensor ICs can operate from a supply voltage as low as 2.2 V, promoting energy efficiency.

The push-pull output does not require a pull-up resistor and can operate with very low current levels, potentially helping to reduce cost and minimizing the total current consumption.

SL351LT:Very low duty cycle (0.1% typ.) resulting in extended battery life in applications requiring extremely Low current drain (5μA typ.)and not requiring a high switching speed.

The SL351LT has a typical operating point of ±55 Gauss at 25 °C [77 °F].

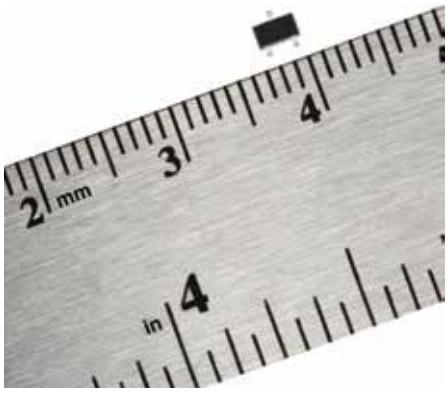
These sensors are available in a subminiature SOT-23 surface mount package on tape and reel (3000 units per reel), for use in automated pick-and-place component installation.

What makes our sensors better?

- **Energy efficient**
  Supply voltage as low as 2.2 Vdc, combined with very low average Current (5 μA typ. For SL351LT the lowest in its class), reduces power consumption, provides extended battery life, and promotes energy efficiency.

- **Push-pull output does not require external pull-up resistor**
  Simplifies interface with common electrical circuits and likely reducing PCB (Printed Circuit Board) space and costs to the customer.

- **Non-chopper stabilized design**
  Does not utilize chopper stabilization, eliminating the noise generated by products using this technique. Customers do not need filters to eliminate the chopper noise, helping to reduce PCB (Printed Circuit Board space, part counts, and costs for the application.



SL351LT

table 1. electrical and environmental characteristics for SL351LT

characteristic	condition	min.	typ.	max.	unit
Supply voltage (Vs)	Ta = -40 °C to 85 °C	2.2	2.8	5.5	V
Active mode current	Vs = 3.0 V, Ta = 25 °C	—	1.5	3	mA
Sleep mode current	Vs =3.0 V, Ta = 25 °C	—	3.5	7	µA
Average current:	Vs =3.0 V, Ta =25 °C	—	5.0	10	µA
Active mode time	Vs =3.0 V, Ta =25 °C	—	40	80	µs
Period:	Vs =3.0 V, Ta =25 °C	30	40	80	ms
Duty cycle:	Vs =3.0 V, Ta =25 °C		0.1		%
Vout:					
high	Vs = 2.8 V to 3.0 V, Ta = 25 °C, load current =1.0 mA	Vs-0.2		—	V
low	Vs = 2.8 V to 3.0 V, Ta = 25 °C, load current =1.0 mA	—		0.2	
Operating temperature	Vs = 2.2 V to 5.5 V, Ta = 25 °C	-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”.

table 2. magnetic characteristics for SL351LT .

characteristic	condition	min.	typ.	max.	unit
Operate point (positive)	Vs = 2.2 V to 5.5 V, Ta = 25 °	20		55	Gauss
Operate point (negative)	Vs = 2.2 V to 5.5 V, Ta = 25 °	-55		-20	Gauss
Release point (positive)	Vs = 2.2 V to 5.5 V, Ta = 25 °	10		45	Gauss
Release point (negative)	Vs = 2.2 V to 5.5 V, Ta = 25 °	-45		-10	Gauss
Hysteresis	Vs = 2.2 V to 5.5 V, Ta = 25 °		10		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. absolute maximum ratings

characteristic	condition	min.	typ.	max.	unit
Supply voltage	—	-0.5	—	6	V
Operating temperature	ambient	-40 [-40]	—	85[185]	°C [°F]
Soldering temperature	Applied for <10 s	—	—	260 [500]	°C [°F]
Load current	—	—	—	5	mA

notice

These 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 necessarily operate at absolute maximum ratings.

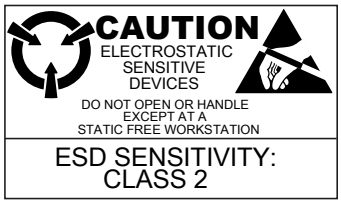


figure 1. block/electrical diagram

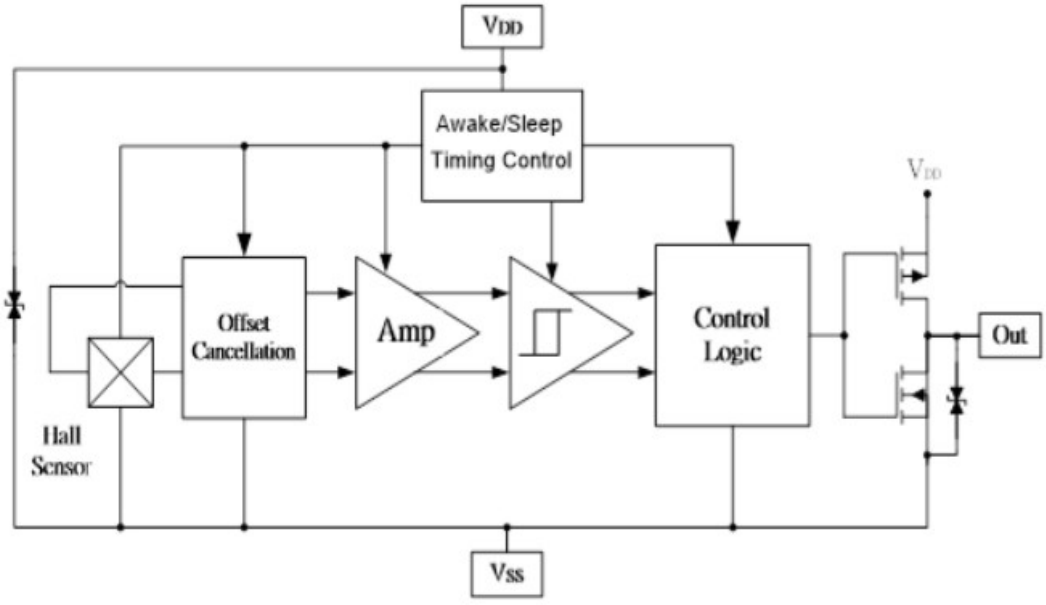
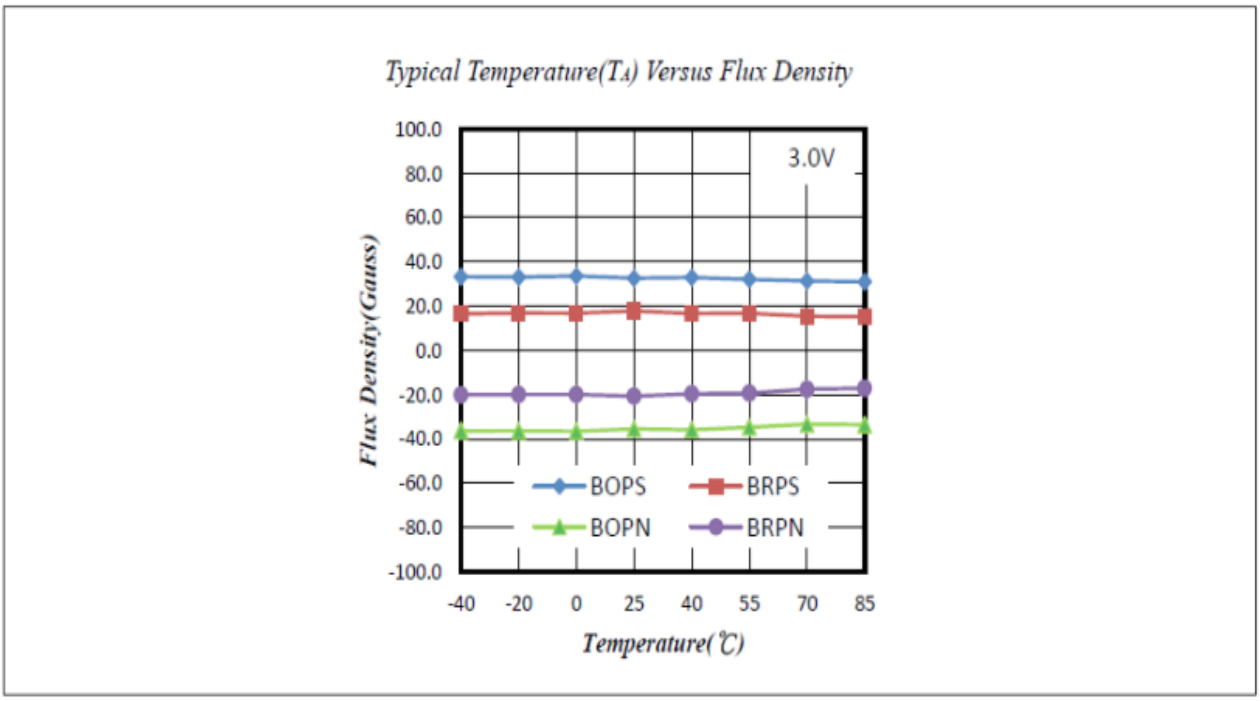
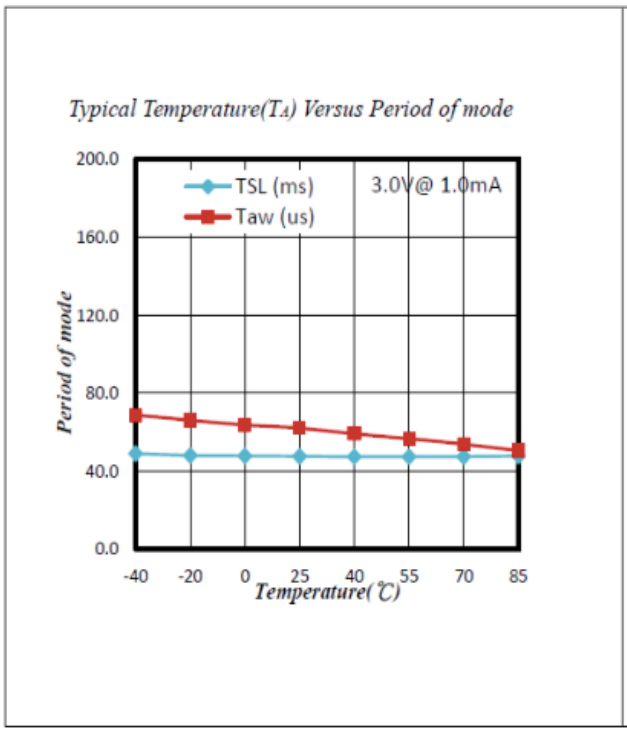


figure 2. typical Performance characteristics





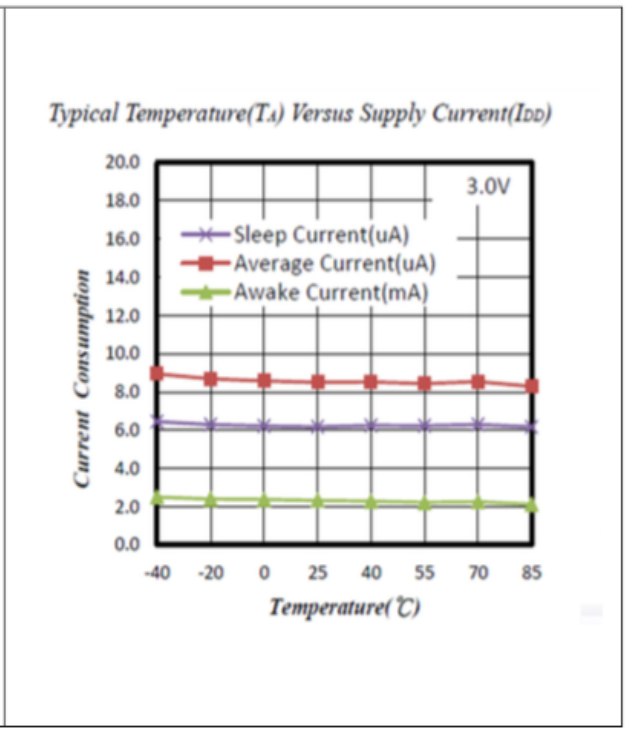


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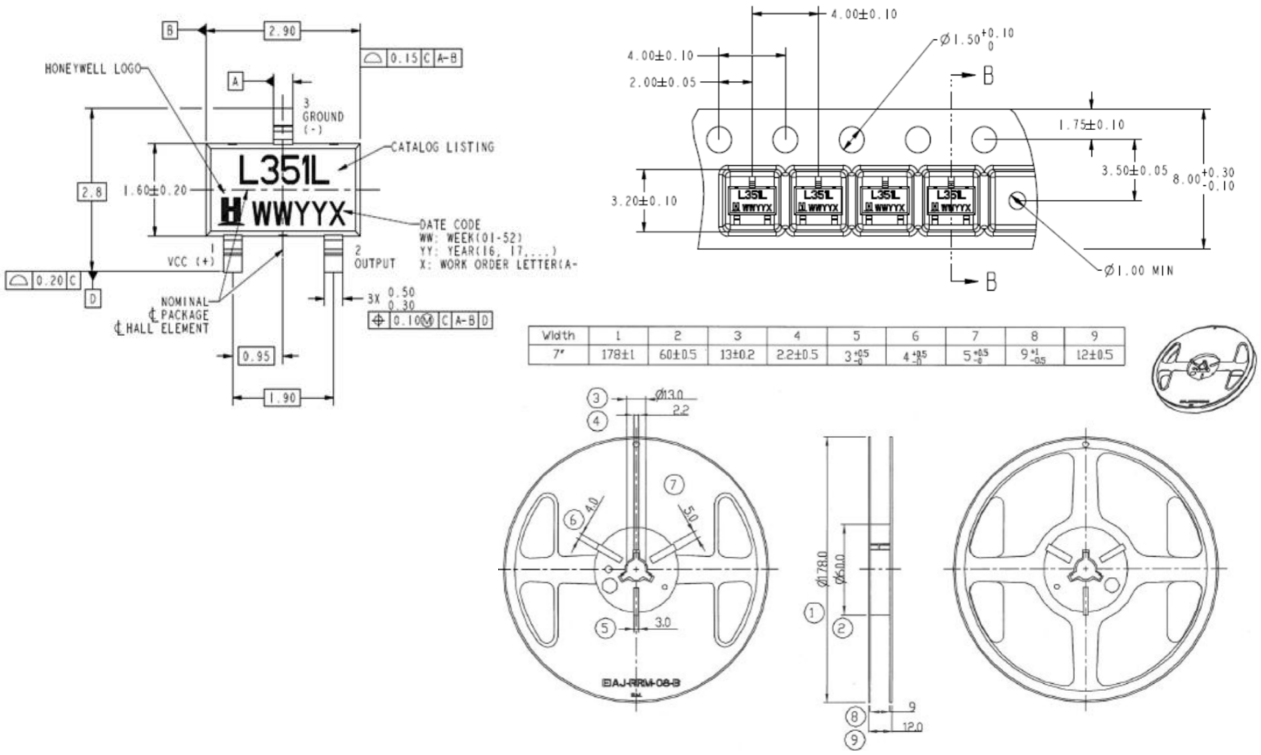
Figure 3. Package, Mounting and Tape/Reel Dimensions (For reference only. mm/[in].)



ADDITIONAL INFORMATION

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

- Product line guide
- Product range guide
- Sensors and switches for potential medical applications
- Product installation instructions
- Application note: Shaft Encoding - Tachometer

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.**

While we provide application assistance personally, through our literature and the Honeywell website, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

⚠ 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.

Sensing and Control
Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422
honeywell.com

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