

INA301

36-V, Low- or High-Side, High-Speed, Zero-Drift, Voltage-Output, Current-Shunt Monitor with High-Speed, Overcurrent Comparator

1 Features

- Wide Common-Mode Input Range: 0 V to 36 V
- Dual Output: Amplifier and Comparator Output
- High Accuracy Amplifier:
 - Offset Voltage: 100 μV
 - Offset Voltage Drift: 0.5 $\mu\text{V}/^\circ\text{C}$
 - Gain Error: 0.15%
 - Gain Error Drift: 10 ppm/ $^\circ\text{C}$
- Available Amplifier Gains:
 - INA301A1: 20 V/V
 - INA301A2: 50 V/V
 - INA301A3: 100 V/V
- Programmable Threshold Set Through a Single Resistor
- Total Alert Response Time: 1 μs
- Open-Drain Output With Latching Mode
- Package: MSOP-8

2 Applications

- Overcurrent Protection
- Power-Supply Protection
- Circuit Breakers
- Computers and Servers
- Telecom Equipment
- Battery Management

3 Description

The INA301 includes both a high common-mode current-sensing amplifier as well as a high-speed precision comparator configured to detect overcurrent conditions through measuring the voltage developed across a current-sensing or shunt resistor. This current shunt monitor can measure this differential voltage signal on common-mode voltages that can vary from 0 V up to 36 V, independent of the supply voltage. The device features an adjustable threshold range that is set using a single external limit-setting resistor.

An open-drain alert output on the device can be configured to operate in either a transparent mode where the output status follows the input state or in a latched mode where the alert output is cleared when the latch is reset. The device alert response time is issued in under 1 μs to allow for quick detection of overcurrent events.

This device operates from a single 2.7-V to 5.5-V supply, drawing a maximum supply current of 700 μA . The device is specified over the extended operating temperature range (-40°C to $+125^\circ\text{C}$), and is available in an MSOP-8 package.

Device Information

PART NUMBER	PACKAGE	BODY SIZE
INA301	MSOP (8)	3.0 mm x 3.0 mm

Typical Application

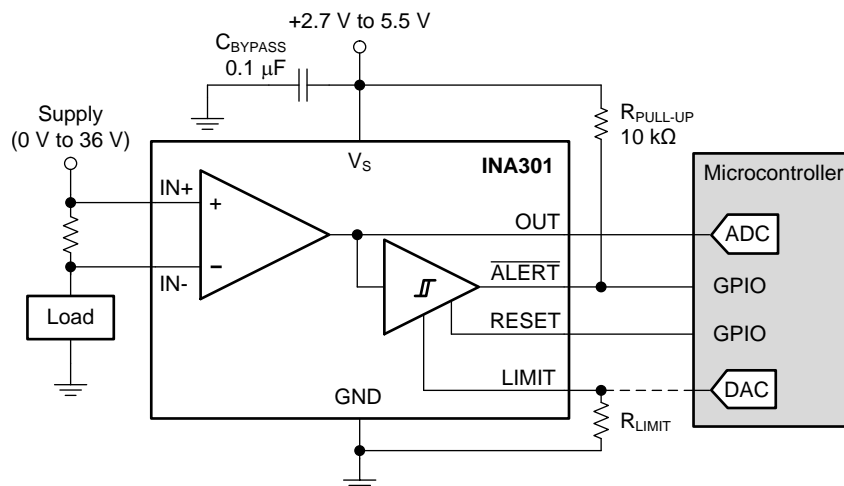


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4 Revision History

DATE	REVISION	NOTES
September 2015	*	Initial release.

PRODUCT PREVIEW

5 Device and Documentation Support

5.1 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

TI E2E™ Online Community *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

5.2 Trademarks

E2E is a trademark of Texas Instruments.
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5.3 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

5.4 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical packaging and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
INA301A1IDGKR	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGD6	
INA301A1IDGKT	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGD6	
INA301A2IDGKR	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGI6	
INA301A2IDGKT	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGI6	
INA301A3IDGKR	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGH6	
INA301A3IDGKT	PREVIEW	VSSOP	DGK	8		Green (RoHS & no Sb/Br)	CU NIPDAUAG	Level-2-260C-1 YEAR	-40 to 125	ZGH6	

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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DGK (S-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



4073329/E 05/06

- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0.50 per side.
 - E. Falls within JEDEC MO-187 variation AA, except interlead flash.

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