



ADS131E08S Analog Front-End for Power Monitoring, Control, and Protection

1 Features

- ADS131E08 with Fast Power-on-Time
- Eight Differential Current and Voltage Inputs
- Outstanding Performance:
 - Exceeds Class 0.1 Performance
 - Dynamic Range at 1 kSPS: 118 dB
 - Crosstalk: –118 dB
 - THD: –100 dB at 50 Hz and 60 Hz
- Supply Range:
 - Analog:
 - 3 V to 5 V (Unipolar)
 - ± 2.5 V (Bipolar)
 - Digital: 1.8 V to 3.6 V
- Low Power: 2 mW/Channel
- Data Rates: 1, 2, 4, 8, 16, 32, and 64 kSPS
- Programmable Gains (1, 2, 4, 8, and 12)
- Fault Detection and Device Self-Testing Capability
- SPI™ Data Interface and Four GPIOs
- Package: TQFP-64 (PAG)
- Operating Temperature Range: –40°C to 105°C

2 Applications

- Industrial Power Applications:
 - Circuit Breakers
 - Energy Metering
 - Monitoring, Control, and Protection

3 Description

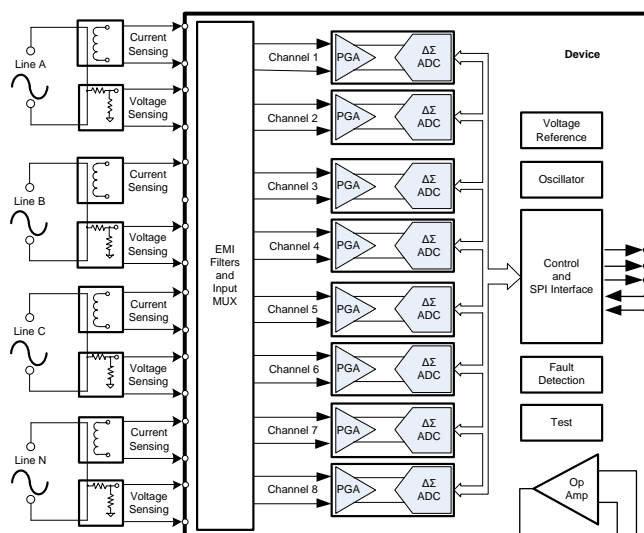
The ADS131E08S is a multichannel, simultaneous sampling, 24-bit, delta-sigma ($\Delta\Sigma$), analog-to-digital converter (ADC) with a built-in programmable gain amplifier (PGA), internal reference, and an onboard oscillator.

The ADS131E08S uses the core from the ADS131E08 family with improved the startup time for line powered power applications. It incorporates features commonly required in industrial power monitoring, control, and protection applications with first data available within 3 ms of power applied to the device. Interface the ADS131E08S inputs independently and directly interfaced with a resistor-divider network or a transformer to measure voltage. Interface the inputs to a current transformer or Rogowski coil to measure current. With high integration levels and exceptional performance, the ADS131E08S enables the creation of scalable industrial power systems at significantly reduced size, power, and low overall cost.

The ADS131E08S has a flexible input multiplexer per channel that can be independently connected to the internally-generated signals for test, temperature, and fault detection. Fault detection can be implemented internal to the device, using the integrated comparators with digital-to-analog converter (DAC)-controlled trigger levels. The ADS131E08S can operate at data rates as high as 64 kSPS.

These complete analog front-end (AFE) solutions are packaged in a TQFP-64 package and are specified over the industrial temperature range of –40°C to 105°C.

Power Application: Three-Phase Connection



Device Information⁽¹⁾

| PART NUMBER | PACKAGE | BODY SIZE (NOM) |
|-------------|-----------|---------------------|
| ADS131E08S | TQFP (64) | 10.00 mm × 10.00 mm |

(1) For all available packages, see the orderable addendum at the end of the data sheet.



4 Device and Documentation Support

4.1 Documentation Support

4.1.1 Related Documentation

ADS131E04, ADS131E06, ADS131E08 Data Sheet, [SBAS561](#)

4.2 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](#).

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4.3 Trademarks

E2E is a trademark of Texas Instruments.

SPI is a trademark of Motorola.

All other trademarks are the property of their respective owners.

4.4 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.

4.5 Glossary

[SLYZ022](#) — *TI Glossary*.

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

5 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 |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|---------|
| ADS131E08SPAG | PREVIEW | TQFP | PAG | 64 | 160 | TBD | Call TI | Call TI | -40 to 105 | | |
| ADS131E08SPAGR | PREVIEW | TQFP | PAG | 64 | 1500 | TBD | Call TI | Call TI | -40 to 105 | | |

(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.

OBSOLETE: 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.

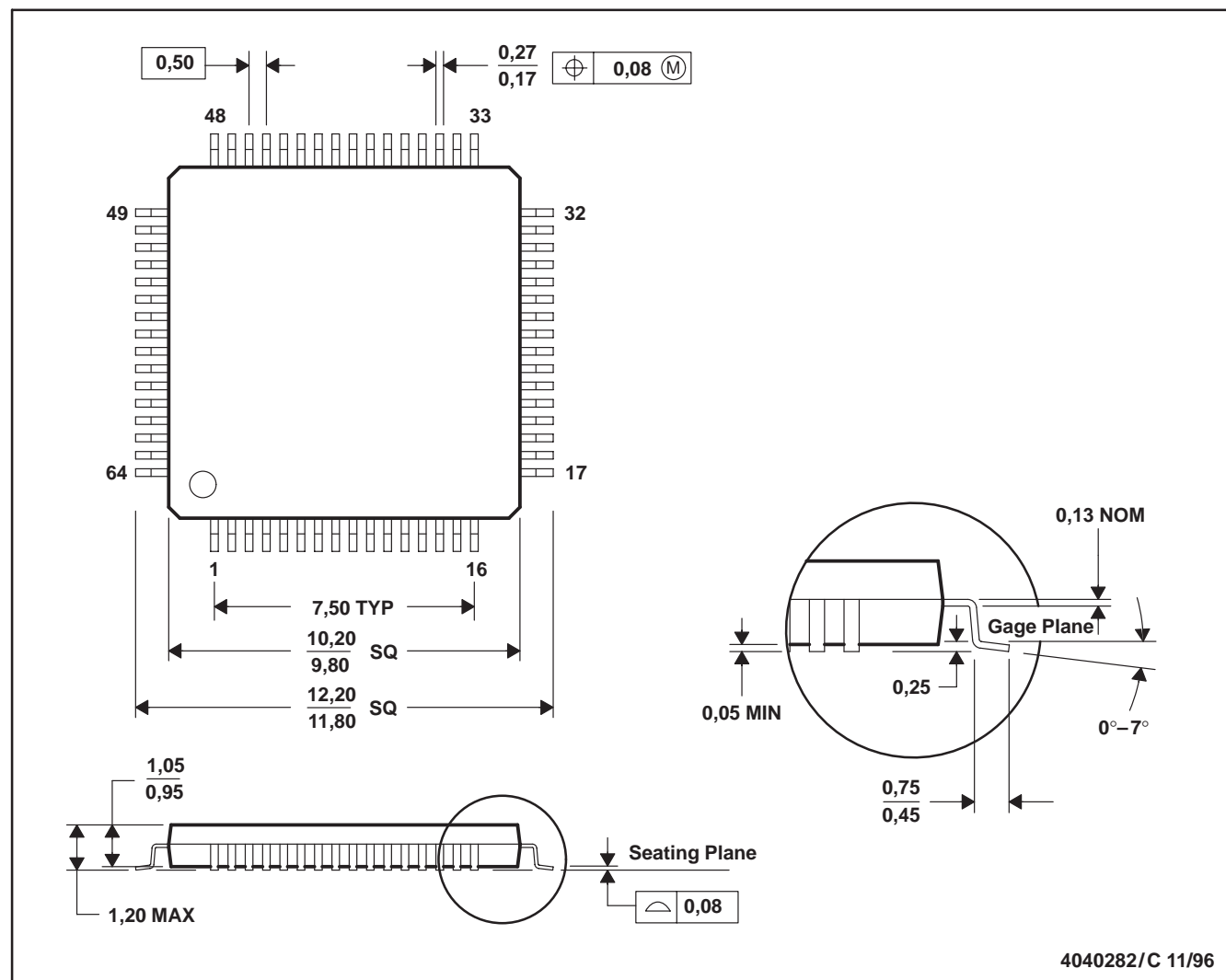
(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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PAG (S-PQFP-G64)

PLASTIC QUAD FLATPACK



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Falls within JEDEC MS-026

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