AMC4330R Precision, Fully-Differential, ±1V Input, Reinforced Isolated Amplifier With Single-Ended, Ratiometric Output and Integrated DC/DC

1 Features

- Single-supply operation (3.3V or 5V) with integrated DC/DC converter
- DC/DC external load current: 8mA (maximum)
- High input impedance: 2.5GΩ (typical)
- Linear input voltage range: ±1V
- Fully-Differential Input and Single-ended output, ratiometric to V_{REFIN}
  - Reference Input: 2.7V to 5.5V
- Low DC errors:
  - Offset error: ±1.5mV (maximum)
  - Offset drift: ±10µV/°C (maximum)
  - Gain error: ±0.25% (maximum)
  - Gain drift: ±40ppm/°C (maximum)
  - Nonlinearity: ±0.025% (maximum)
- High CMTI: 150V/ns (minimum)
- Low EMI: Meets CISPR-11 and CISPR-25 standards
- System-level diagnostic features
- Isolation ratings:Reinforced isolation
- Safety-related certifications:
  - DIN EN IEC 60747-17 (VDE 0884-17)
  - UL1577
- Fully specified over the industrial temperature range: –40°C to +125°C

2 Applications

- Motor drives
- Photovoltaic inverters
- Server power-supply units (PSU)
- EV charging stations

3 Description

The AMC4330R is a precision, galvanically isolated amplifier with a fully integrated, isolated DC/DC converter that allows single-supply operation from the low-side of the device. The DC/DC converter is capable of sourcing an external current of up to 8mA to power additional device (example:AMC0300D, AMC23C12) on the high side. The high-impedance input is optimized for connection to a high-impedance resistive divider or other voltage signal source with high output resistance.

The isolation barrier separates parts of the system that operate on different common-mode voltage levels. The isolation barrier is highly resistant to magnetic interference. This barrier is certified to provide reinforced isolation up to 5kV_{RMS}.

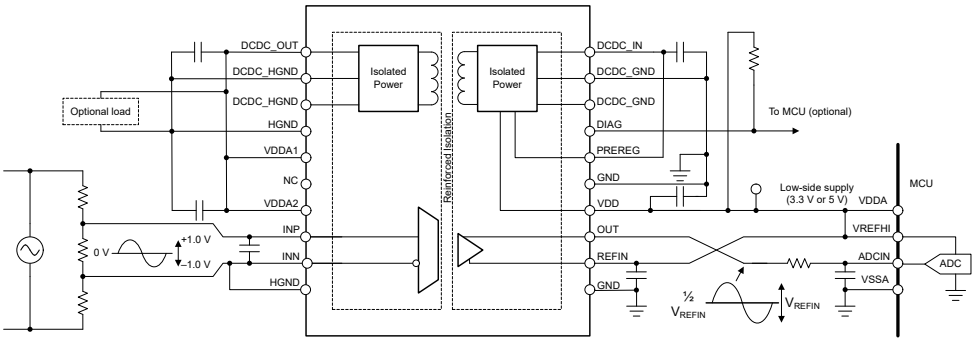
The AMC4330R outputs a single-ended signal proportional to the input voltage. The full-scale output is set by the voltage applied to the REFIN pin. The output of the AMC4330R is designed to connect directly to the input of an ADC. Connect REFIN to the same reference voltage as the ADC to match the dynamic input voltage range of the ADC.

The AMC4330R device comes in 20-pin, wide-body SOIC package, and is fully specified over the temperature range from –40°C to +125°C.

Package Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)
AMC4330R	DVV (SOIC, 20)	5.6mm × 10.63mm

(1) For more information, see the *Mechanical, Packaging, and Orderable Information* .
(2) The package size (length × width) is a nominal value and includes pins, where applicable.



Typical Application

ADVANCE INFORMATION

ADVANCE INFORMATION

4 Device and Documentation Support

4.1 Documentation Support

4.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, *Isolation Glossary* application note
- Texas Instruments, *Semiconductor and IC Package Thermal Metrics* application note
- Texas Instruments, *ISO72x Digital Isolator Magnetic-Field Immunity* application note
- Texas Instruments, *TLV900x Low-Power, RRIO, 1MHz Operational Amplifier for Cost-Sensitive Systems* data sheet
- Texas Instruments, *SN6501 Transformer Driver for Isolated Power Supplies* data sheet
- Texas Instruments, *18-Bit, 1MSPS Data Acquisition Block (DAQ) Optimized for Lowest Distortion and Noise* reference guide
- Texas Instruments, *18-Bit, 1MSPS Data Acquisition Block (DAQ) Optimized for Lowest Power* reference guide
- Texas Instruments, *Isolated Amplifier Voltage Sensing Excel Calculator* design tool

4.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.3 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is 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.

4.4 Trademarks

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4.5 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.6 Glossary

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

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
May 2026	*	Initial Release

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.

PACKAGE OPTION ADDENDUM

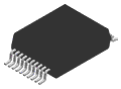
PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/Ball material (4)	MSL rating/Peak reflow (5)	Op temp (°C)	Part marking (6)
PAMC4330RDVVR	Preview	Preproduction	SOIC(DVV) 20		YES	NIPDAU	Level-3-260C-168 HR	-40 to 125	AMC4311

(1) **Status:** For more details on status, see our product life cycle.
(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.
(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.
(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.
(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.
(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

6.1 Mechanical Data

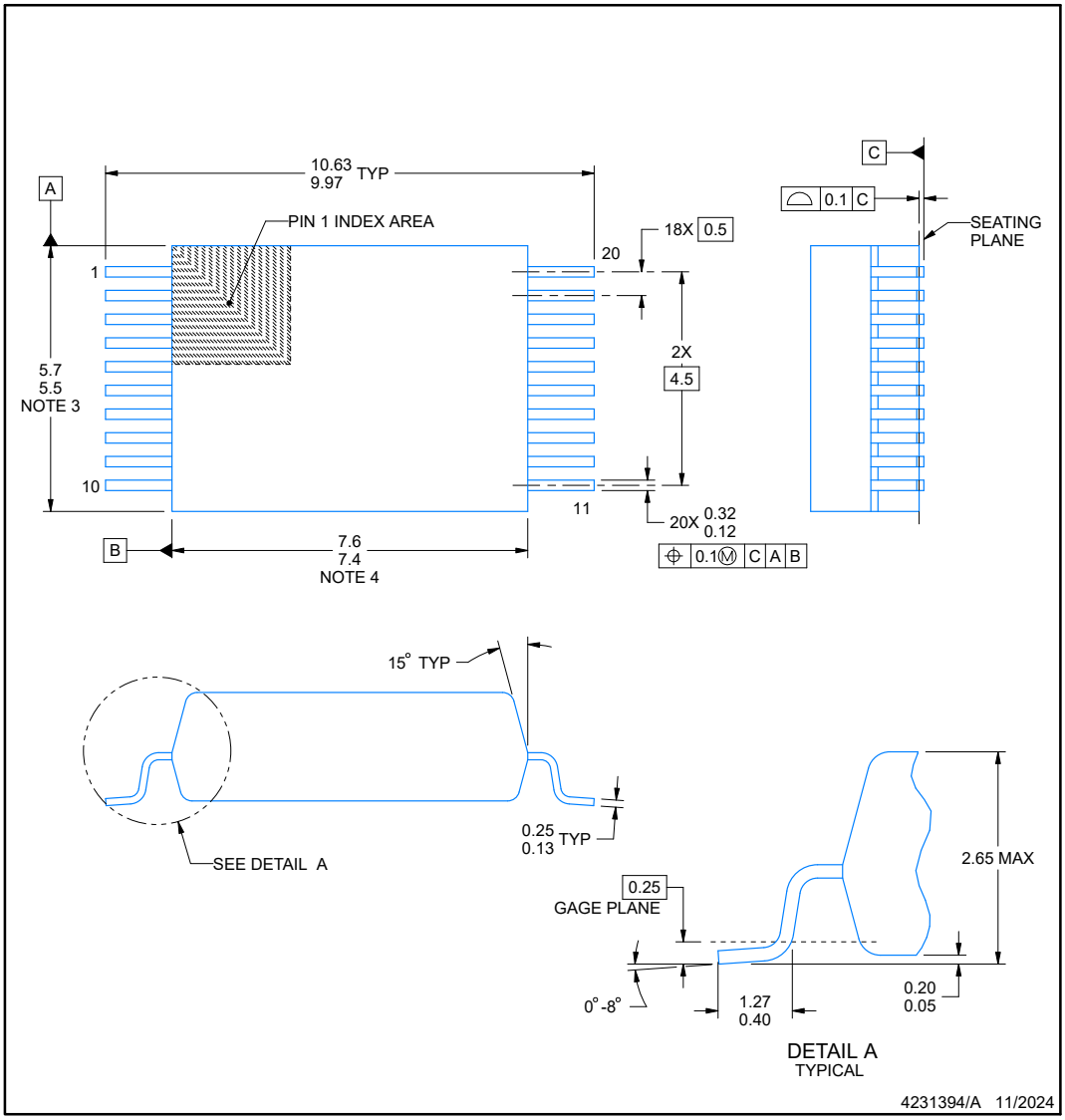
DVV0020A



PACKAGE OUTLINE

SSOP - 2.65 mm max height

SMALL OUTLINE PACKAGE



NOTES:

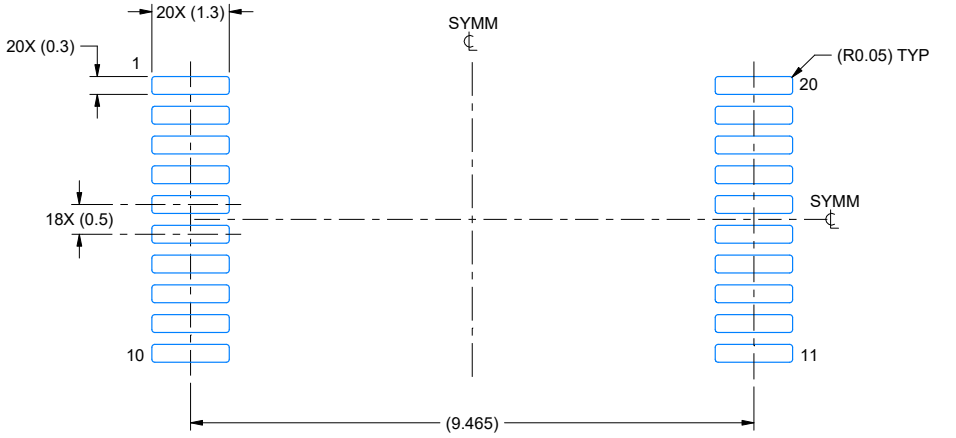
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.

ADVANCE INFORMATION

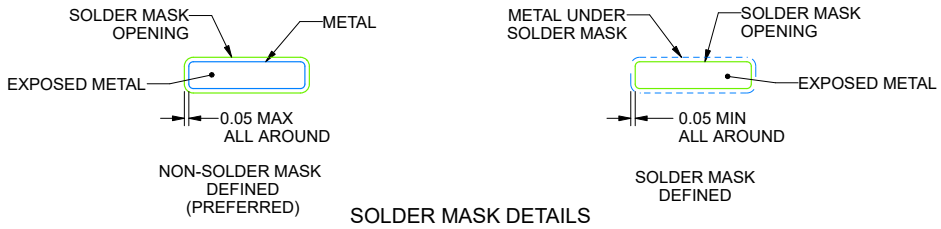
EXAMPLE BOARD LAYOUT

DVV0020A — **SSOP - 2.65 mm max height**

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

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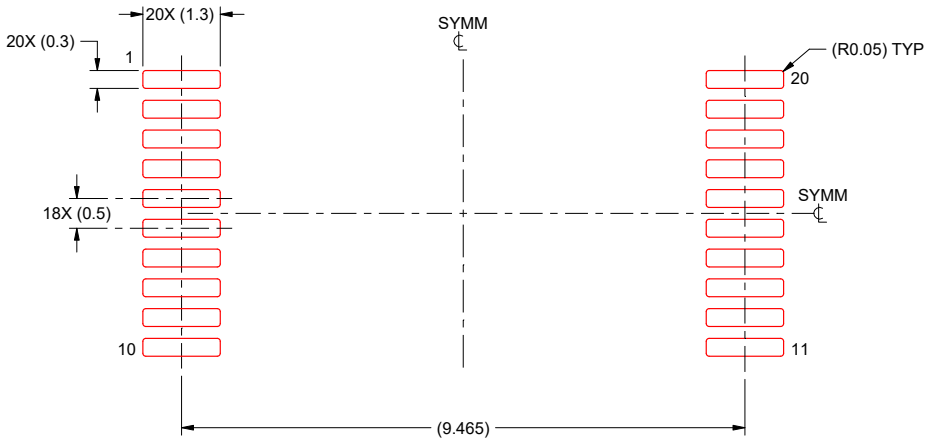
NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DVV0020A — **SSOP - 2.65 mm max height**

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

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NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

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