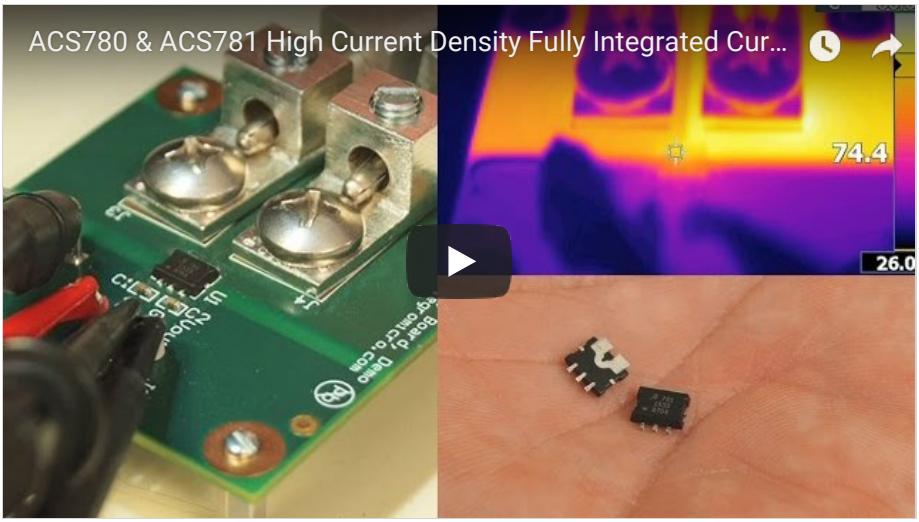
# ACS780xLR: High-Precision Linear Hall-Effect-Based Current Sensor IC With 200 µΩ Current Conductor




The Allegro ACS780xLR is a fully integrated current sensor linear IC in a new core-less package designed to sense AC and DC currents up to 100 A. This automotive-grade, low-profile (1.5 mm thick) sensor IC package has a very small footprint.

The Hall sensor technology also incorporates common-mode field rejection to optimize performance in the presence of interfering magnetic fields generated by nearby current-carrying conductors.

The device consists of a precision, low-offset linear Hall circuit with a copper conduction path located near the die. Applied current flowing through this copper conduction path generates a magnetic field which the Hall IC converts into a proportional voltage. Device accuracy is optimized through the close proximity of the primary conductor to the Hall transducer and factory programming of the sensitivity and quiescent output voltage at the Allegro factory.

Chopper-stabilized signal path and digital temperature compensation technology also contribute to the stability of the device across the operating temperature range. High-level immunity to current conductor dV/dt and stray electric fields is offered by Allegro proprietary integrated shield technology, for low-output voltage ripple and low-offset drift in high-side, high-voltage applications.

The output of the device has a positive slope (>VCC / 2) when an increasing current flows through the primary copper conduction path (from terminal 5 to terminal 6), which is the path used for current sampling. The internal resistance of this conductive path is 200 µΩ typical, providing low power loss.

The thickness of the copper conductor allows survival of the device at high overcurrent conditions. The terminals of the conductive path are electrically isolated from the signal leads (pins 1 through 4, and 7), allowing the device to operate safely with voltages up to 100 V peak on the primary conductor.

The device is fully calibrated prior to shipment from the factory. The ACS780xLR family is lead (Pb) free. All leads are plated with 100% matte tin, and there is no Pb inside the package. The heavy gauge leadframe is made of oxygen-free copper.

FEATURES & BENEFITS | PACKAGING | TECHNICAL DOCS | NEWS

- Core-less, micro-sized, 100 A continuous current package
- Ultra-low power loss: 200 µΩ internal conductor resistance
- Immunity to common-mode field interference
- Greatly improved total output error through digitally programmed and compensated gain and offset over the full operating temperature range
- Industry-leading noise performance through proprietary amplifier and filter design techniques
- Integrated shield greatly reduces capacitive coupling from current conductor to die due to high dV/dt signals, and prevents offset drift in high-side, high-voltage applications
- Monolithic Hall IC for high reliability
- 4.5 to 5.5 V, single supply operation
- 120 kHz typical bandwidth
- 3.6 µs output rise time in response to step input current
- Output voltage proportional to AC or DC currents
- Factory-trimmed for accuracy

## DATASHEETS

ACS780 Datasheet

## SAMPLE & BUY

**Kitchen & Kutchin** *(Allegro & Sanken Semiconductors, Sanken Power Supplies)*
12 Gill Street
Suite 1950
Woburn, MA 01801
Phone: (781)782-0700
Fax: (781)782-0705
Web: www.kitchenkutchin.com

*If this is not your local representative, find your local sales rep here.*

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## ACS780 Product Image


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1 2 3

- Extremely stable quiescent output voltage
- AEC-Q100 automotive qualification

## Part Number Specifications and Availability

| Part Number | Package Type | Temperature | RoHS Compliant | Part Composition / RoHS Data | Comments | Samples | Check Distributor Stock |
|---|---|---|---|---|---|---|---|
| ACS780KLSTR-150B-T | n/a | -20°C to 85°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780KLSTR-150U-T | n/a | -20°C to 85°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLSTR-050U-T | n/a | -20°C to 85°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLSTR-100B-T | n/a | -20°C to 85°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLSTR-100U-T | n/a | -20°C to 85°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780KLRTR-150B-T | 7-lead SOT | -40°C to 125°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780KLRTR-150U-T | 7-lead SOT | -40°C to 125°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ASEK780KLR-150B-T | DEMO BOARD | -40°C to 125°C | No | -- | | Contact your local sales rep | Check Stock |
| ASEK780KLR-150U-T | DEMO BOARD | -40°C to 125°C | No | -- | | Contact your local sales rep | Check Stock |
| ASEK780KLS-150B-T | DEMO BOARD | -40°C to 125°C | No | -- | | Contact your local sales rep | Check Stock |
| ACS780LLRTR-050B-T | 7-lead SOT | -40°C to 150°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLRTR-050U-T | 7-lead SOT | -40°C to 150°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLRTR-100B-T | 7-lead SOT | -40°C to 150°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ACS780LLRTR-100U-T | 7-lead SOT | -40°C to 150°C | Yes | View Data | | Contact your local sales rep | Check Stock |
| ASEK780LLR-100B-T | DEMO BOARD | -40°C to 150°C | No | -- | | Contact your local sales rep | Check Stock |
| ASEK780LLR-100U-T | DEMO BOARD | -40°C to 150°C | No | -- | | Contact your local sales rep | Check Stock |

**Allegro's products are not to be used in any devices or systems, including but not limited to life support devices or systems, in which a failure of Allegro's product can reasonably be expected to cause bodily harm.**