ACS71010

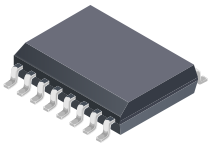
High Accuracy, Hall-Effect Current Sensor with Adjustable FAULT Output and Reference Voltage in SOICW-16 Package

FEATURES AND BENEFITS

- High operating bandwidth for fast control loops or where high-speed currents are monitored
  - □ 400 kHz bandwidth
  - □ 1.1 µs typical response time
- High performance for optimized energy applications
  - □ <±0.6% sensitivity error and ±4 mV maximum offset voltage over temperature (3σ, –40°C to 105°C)
  - □ Non-ratiometric operation with V_{REF} output
  - □ Differential sensing for high immunity to external magnetic fields
  - □ No magnetic hysteresis
- Adjustable fast overcurrent fault with 1 µs typical response time
- Low internal primary conductor resistance 0.85 mΩ
- UL 62368-1 (edition 3) certification, highly isolated compact SOICW-16 surface mount package
  - □ 5000 V_{RMS} withstand voltage
  - □ 1097 V_{RMS} / 1550 V_{DC} basic insulation voltages
  - □ 565 V_{RMS} / 800 V_{DC} reinforced insulation voltages
- Optimized temperature range, –40°C to 105°C, with functional operation up to 125°C
- Grade 2 AEC-Q100, automotive qualified (pending)

PACKAGE: 16-Pin SOICW (suffix MA)

Not to scale



DESCRIPTION

The ACS71010 is a fully integrated Hall-effect current sensor in a SOICW-16 package that is factory-trimmed to provide high accuracy over the entire operating range without the need for customer programming. The current is sensed differentially by two Hall plates that subtract out interfering external common-mode magnetic fields.

The package construction provides high isolation by magnetically coupling the field generated by the current in the conductor to the monolithic Hall sensor IC which has no physical connection to the integrated current conductor. The MA package is optimized for higher isolation with a withstand voltage, 5000 V_{RMS}, and 0.85 mΩ conductor resistance.

The ACS71010 has functional features that are externally configurable and robust without the need for programming. A fast overcurrent fault output provides short-circuit detection for system protection with a fault threshold that is proportional to the current range and can be set with an analog input. The reference pin provides a stable voltage that corresponds to the 0 A output voltage. This reference voltage allows for differential measurements as well as a device-referred voltage to set the overcurrent fault threshold.

Devices are RoHS compliant and lead (Pb) free with 100% matte-tin-platted leadframes.

APPLICATIONS

- Solar (PV) Inverters
  - □ PV Monitoring
  - □ MPPT
- EV Charging
- Energy Storage Systems (ESS)
- Power Supplies (UPS, SMPS)
- DC/AC Phase Current Sensing

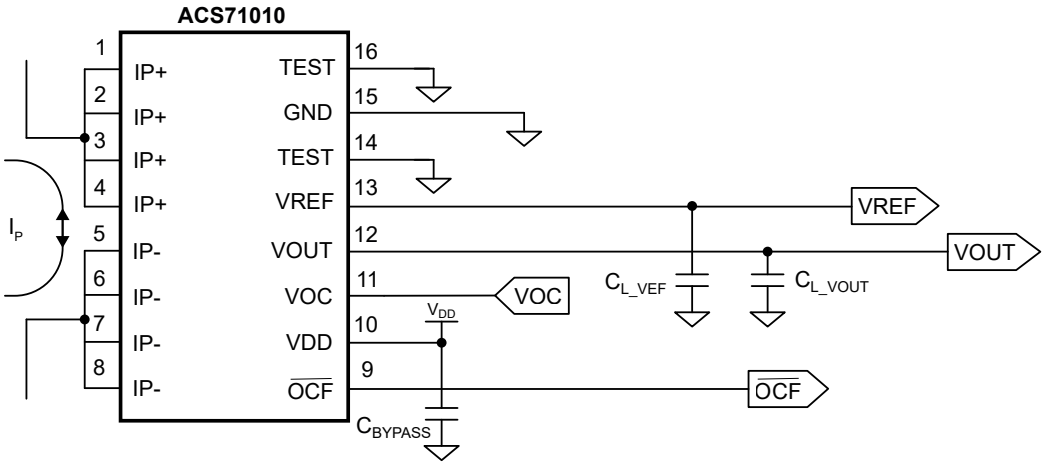


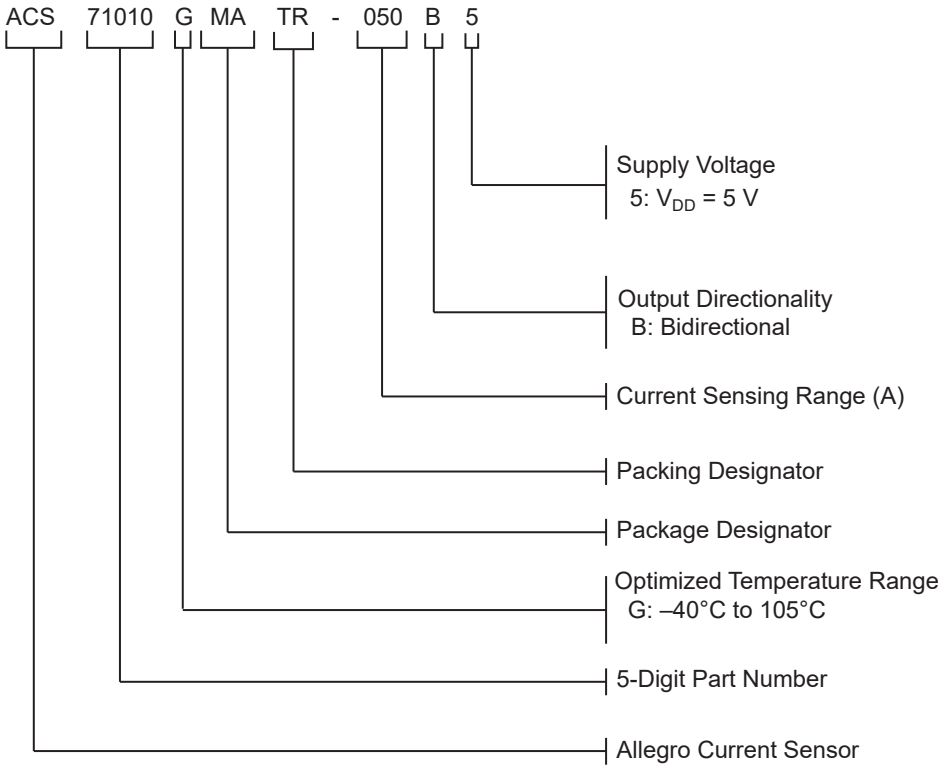
Figure 1: Typical Bidirectional Application
(refer to "Application and Theory" on page 16 for additional application circuits)

The device outputs an analog signal, V_{OUT}, that varies linearly with the AC or DC primary current, I_P, within the ranges specified.

SELECTION GUIDE

Part Number	Current Sensing Range (A)	Sensitivity (mV/A)	Supply Voltage V_{DD} (V)	Quiescent Voltage Output V_{QVO} (V)	Optimized Temperature Range T_A (°C)	Packing
ACS71010GMATR-050B5	±50	40	5	2.5	–40 to 105	1000 pieces per 13-inch reel
ACS71010GMATR-080B5	±80	25				

PART NAMING SPECIFICATION



Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

NOTE: This is a short-form datasheet for preview purposes. Pages 3-18 have been removed. Contact Allegro MicroSystems to request complete datasheet.

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PACKAGE OUTLINE DRAWING

For Reference Only – Not for Tooling Use

(Reference Allegro DWG-0000388, Rev. 1 and JEDEC MS-013AA)
NOT TO SCALE
Dimensions in millimeters
Dimensions exclusive of mold flash, gate burrs, and dambar protrusions
Exact case and lead configuration at supplier discretion within limits shown

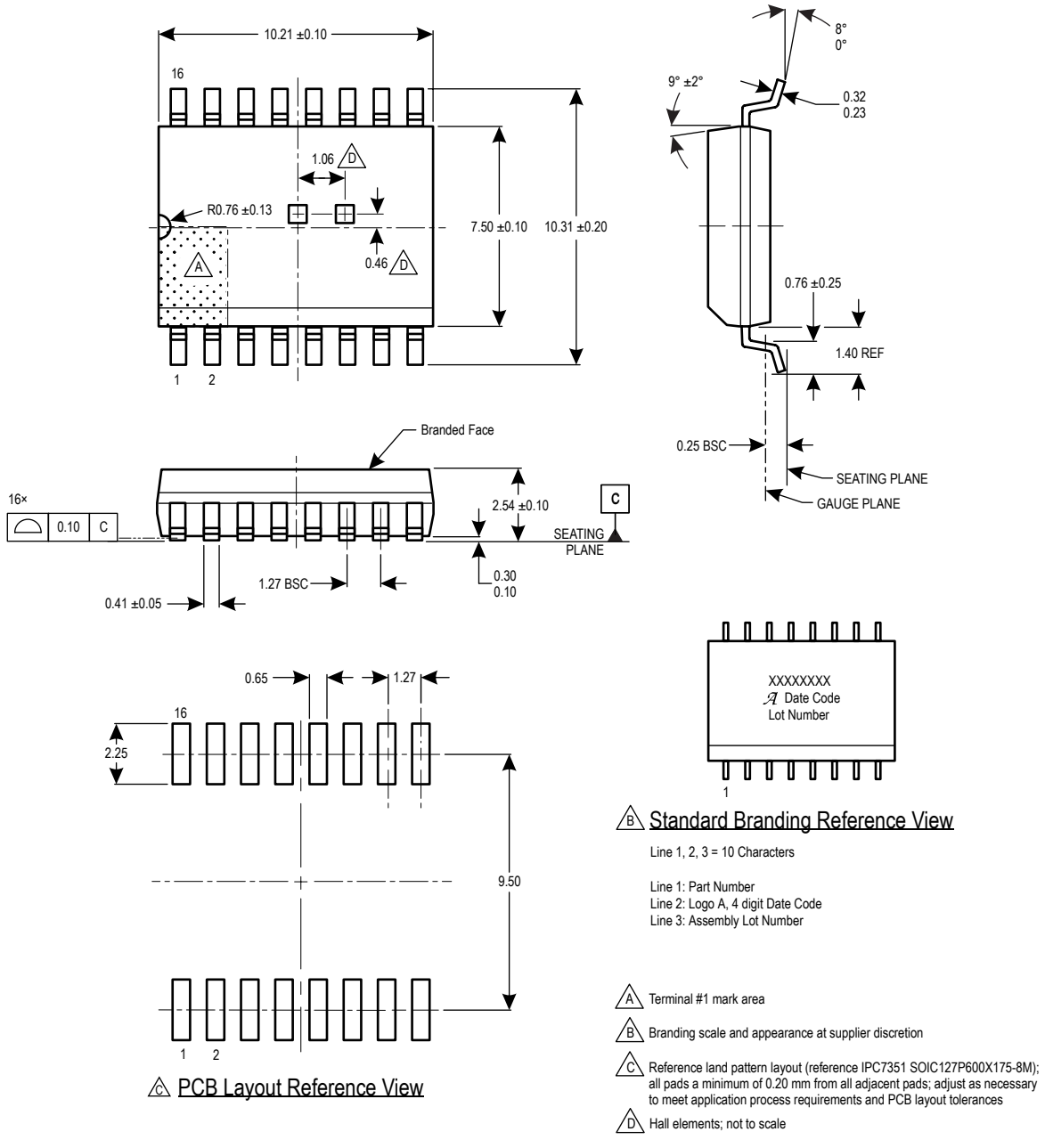

Figure 2: Package MA, 16-Pin SOICW

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REVISION HISTORY

Number	Date	Description
–	March 14, 2025	Initial release

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