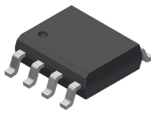
ACS37630

Linear Vertical Hall-Effect Sensor IC for U-Core Current Sensing with High-Bandwidth (250 kHz) and Analog Output

FEATURES AND BENEFITS

- Vertical Hall technology for sensing parallel to package surface, ideal for U-core applications
- Contactless, noninvasive current sensing
- Eliminates the need for C-cores for easy assembly
- Suited for applications where current flows through a busbar or printed circuit board (PCB)
- Factory-programmed temperature compensation (TC) provides low thermal drift
  - Sensitivity ±0.7% (typical)
  - Offset ±5 mV (typical)
- Fast response time of 1.6 µs (typical)
- High operating bandwidth up to 250 kHz
- Low-bandwidth mode (50 kHz) for reduced output noise
- Wide sensitivity range factory-programmable from 1 mV/G to 8.8 mV/G (10 mV/mT to 88 mV/mT)
- Wide measurement range up to 2000 G (200 mT)
- Analog ratiometric output
- Wide ambient operating temperature: –40°C to 150°C
- Monolithic Hall integrated circuit (IC) for high reliability
- Surface-mount, small-footprint, low-profile, 8-pin small-outline integrated circuit (SOIC8) package
- AEC-Q100 Grade 0, automotive qualified

PACKAGE: 8-Pin SOIC (Suffix OL)



OL Package

DESCRIPTION

The ACS37630 is a contactless current sensor designed for applications where current flows through a busbar or PCB. When used with a U-core concentrator (Figure 1), high immunity to stray fields can be achieved, as well as simplified mechanical assembly relative to a traditional C-core current sensor. For high-frequency applications, laminated U-cores should be used.

The sensor uses the Allegro high-precision vertical Hall technology (VHT) to detect magnetic fields parallel to the package surface (Figure 2), while maintaining a monolithic die for high robustness in harsh automotive environments.

The ACS37630 is factory-trimmed over temperature. Sensitivity, offset, bandwidth (250 kHz or 50 kHz), output-voltage clamping, and reaction of the sensor to overvoltage and undervoltage events are configurable. If end-of-line offset and/or sensitivity trimming is required, contact an Allegro representative for guidance.

TYPICAL APPLICATIONS

- High-voltage traction motor inverter for extended electric vehicles (xEVs)
- 48 V/12 V auxiliary inverter
- Power-distribution unit (PDU)
- Battery-disconnect unit (BDU)
- Heterogeneous redundant battery monitoring
- Smart-fuse applications
- Green energy
- Power supply

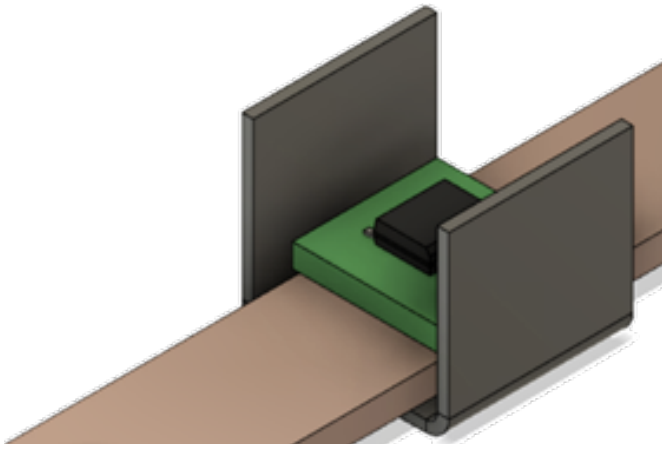


Figure 1: U-Core Application Schematic

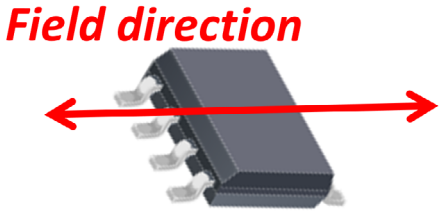
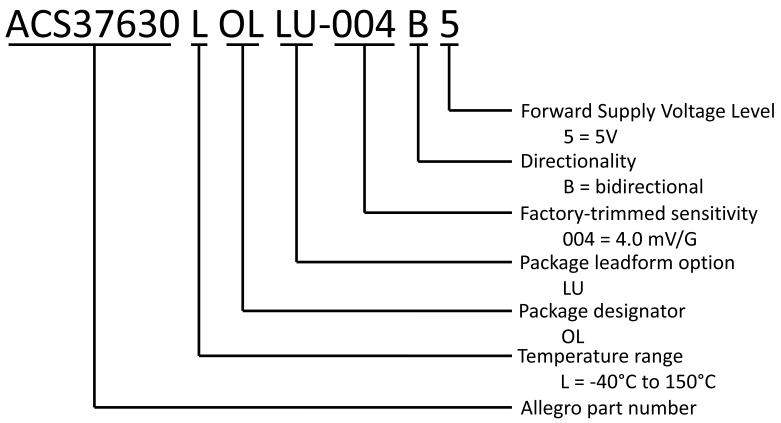


Figure 2: Sensed Field Direction

SELECTION GUIDE

Part Number	Factory-Programmed Sensitivity (mV/G)	Magnetic Field Range (G)
ACS37630LOLLU-004B5	4	±500



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PACKAGE OUTLINE DRAWING

For Reference Only; not for tooling use (reference Allegro DWG-0000385, Rev. 2 or JEDEC MS-012AA)
Dimensions in millimeters
Dimensions exclusive of mold flash, gate burrs, and dambar protrusions
Exact case and lead configuration at supplier discretion within limits shown

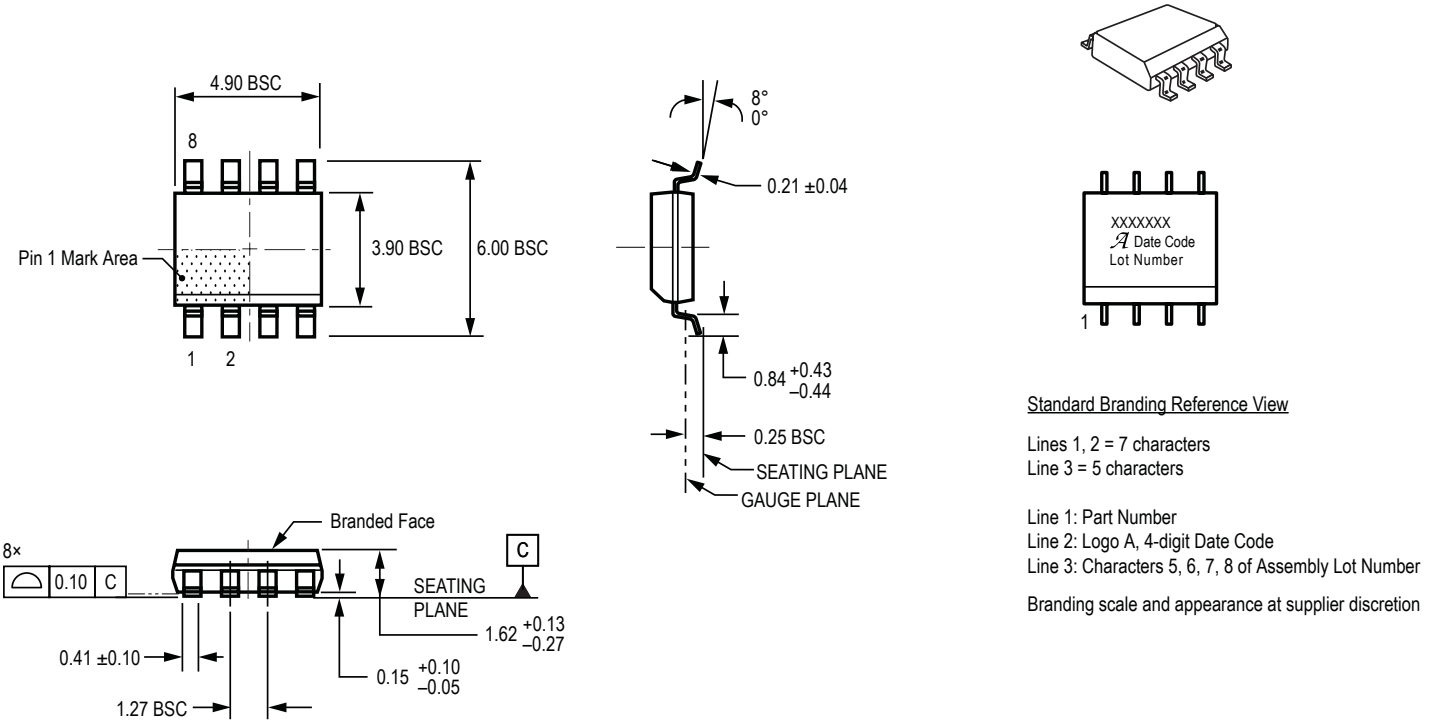

Figure 3: Package OL, 8-Pin SOIC

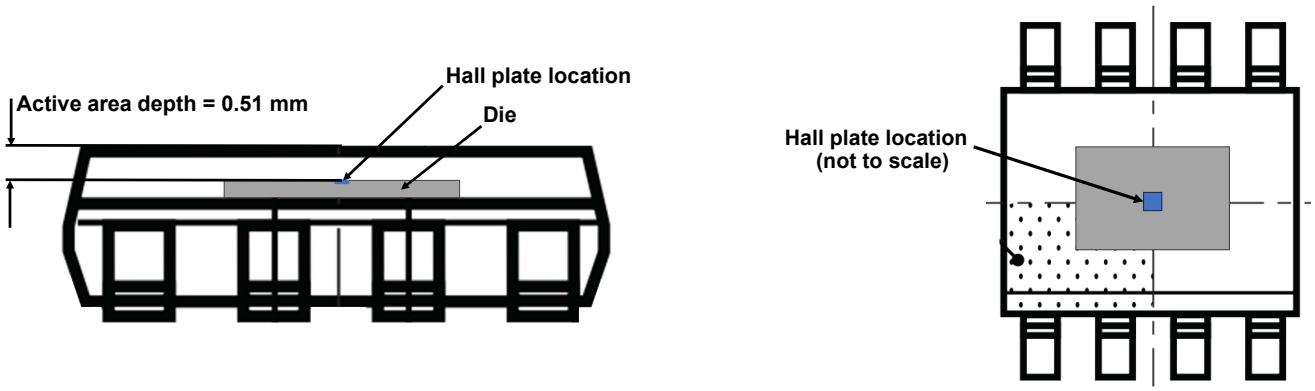

Figure 4: Location and Depth of Hall Elements in ACS37630

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Revision History

Number	Date	Description
–	March 13, 2025	Initial release
1	April 17, 2025	Changed long-form datasheet to limited release and created short-form datasheet

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