

Bidirectional linear current sensor family offers 20 A dynamic range

Allegro MicroSystems Europe has introduced a new family of bidirectional linear Hall-effect current sensors that combine a 20 A dynamic range with an internal resistance of only one milliohm, an accuracy of better than 1.5% and an isolation voltage of 1600 V RMS. The new ACS family offer the smallest isolated integrated current-sensing solution on the market today.

The ACS706 family are isolated integrated devices which provide economical, precise and easy-to-implement solutions for current sensing in industrial, commercial, and communications systems. Typical applications include motor control, load detection and management, switched-mode power supplies, and overcurrent fault protection.

The new bidirectional sensors can measure either AC or DC currents, and feature a power lead frame which is designed for extremely low power loss and is electrically isolated from the sensor signal leads. This isolation allows ACS706 sensors to be used in applications requiring electrical isolation without the need for additional external isolation components.

Each device in the ACS706 family consists of a precision, low-offset linear Hall-effect sensor circuit with a copper conduction path located near the surface of the die. Applied current flowing through this copper conduction path generates a magnetic field which is sensed by the integrated Hall IC and converted into a proportional voltage.

Device accuracy is optimised through the close proximity of the magnetic signal to the Hall transducer. A precise, proportional voltage is provided by the low-offset, chopper-stabilised BiCMOS Hall IC, which is pre-programmed for optimum accuracy at the factory.

The output of the device has a positive slope when an increasing current flows through the primary copper conduction path used for current sensing. The internal resistance of this conductive path is typically 1.5 milliohm, which results in low power loss.

The thickness of the copper conductor used in the sensor means that it can be safely used at up to three times the overcurrent conditions. The terminals of the conductive path are electrically isolated from the sensor leads.

The ACS706 family is provided in a small, surface mount SOIC8 package. The lead frame is plated with 100% matte tin, which is compatible with standard lead (Pb) free printed-circuit-board assembly processes. Internally, the flip-chip uses high-temperature Pb-based solder balls, which are currently exempt from the RoHS Directive. These devices are fully calibrated prior to shipment from the factory.
