Two-Wire, Unipolar, Hall-Effect Switches Improve High Voltage Transient Protection

Allegro MicroSystems, Inc. introduces a new line of user-programmable, two-wire, unipolar, Hall-effect switches to complement its existing family of devices used in seat belt buckle, seat position, and shift selector (PRNDL) applications. These new devices are targeted to serve the automotive market, because they include improved high voltage transient protection; a critical feature for applications that do not allow for protection circuits to be located close to the sensor.

Allegro's A1190/2/3 family consists of two-wire, unipolar, Hall-effect switches, which can be trimmed by the user at end-of-line to optimize magnetic switchpoint accuracy in the application. These devices are produced on the Allegro® advanced BiCMOS wafer fabrication process, which implements a patented high frequency, 4-phase, chopper-stabilization technique. This technique achieves magnetic stability over the full operating temperature range, and eliminates offsets inherent in devices with a single Hall element that are exposed to harsh application environments.

The A119x family has a number of automotive applications. These include: sensing seat track position, seat belt buckle presence, hood/trunk latching, and shift selector position. Two-wire unipolar switches are particularly advantageous in cost-sensitive applications because they require one less wire for operation versus the more traditional open-collector output switches. Additionally, the system designer inherently gains diagnostics, because there is always output current flowing, which should be in either of two narrow ranges. Any current level not within these ranges indicates a fault condition.

An important upgrade to this family of two-wire switches is the on-chip transient protection and a zener clamp to protect against over-voltage conditions on the supply line. This improved high voltage transient protection allows these devices to survive ISO 7637-2 and 40 V load dump for
The A1190, A1192 and A1193 are offered in a SOT-23W style, miniature low profile package (LH) for surface-mount applications.

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