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Hall-effect switches and latches feature chopper stabilisation

Allegro MicroSystems Europe is expanding its family of successful chopper-stabilised Hall-effect switches and latches with four new product offerings: the A3241, A3242, A3230 and A3282. These new products mean that Allegro can now offer a complete family of Hall-effect switches and latches in a variety of sensitivity ranges for position, speed and rotational sensing applications in automotive, consumer electronics and industria applications.

Each device includes, on a single silicon chip, a voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilisation, Schmitt trigger, and a short-circuit protected open-collector output.

The chopper-stabilisation feature of the new devices provides accurate and stable switch points over temperature and minimises the effects of physical stress. Allegro's patented dynamic offset cancellation reduces the residual offset voltage normally caused by device overmoulding, temperatur dependencies, and thermal stress.

Each of the devices offers a particular set of operating characteristics. The output of the A3241 and A3242 switches is 'on' in the presence of a sufficiently strong south-pole magnetic field facing the marked side of the package. It will remain 'on' until the presence of a weaker south-pole magnetic field, and remain 'off' with zero and north-pole magnetic fields.

The output of the A3282 latch will be 'on' in the presence of a sufficiently strong south-pole magnetic field facing the marked side of the package, and will remain 'on' until the presence of a sufficiently strong north-pole magnetic field.

The A3230 bipolar Hall-effect switch generally switches 'on' with a south pole of sufficient strength, and switches 'off' with a north pole of sufficient strength. The output state, however, is not defined if the magnetic field is removed, so an opposing magnetic field of sufficient strength is needed to ensure that the device switches.

Advanced BiCMOS wafer fabrication processing is used to optimise the devices for low-voltage operation, component matching, very low input-offset errors, and small component geometries.

These new switches and latches feature robust ESD capability, reverse battery protection and output short-circuit protection, and will operate from an unregulated supply.

Two package styles provide magnetically optimised configurations for most applications. Suffix 'LH' is a miniature low-profile surface-mount package, while suffix 'UA' is a three-lead ultra-miniature single-inline package for through-hole mounting. All four devices are rated for operation over the temperature range from –40°C to +150°C.