

## Automotive Hall-sensor module uses patented algorithms to minimise vibration effects

The new ATS651LSH from Allegro MicroSystems Europe is a Hall-effect sensor module that is optimised to meet the requirements for speed and direction sensing in automotive transmission applications. In particular, the new device employs patented algorithms which are designed to minimise the effects of vibration.

The ATS651LSH is an integrated Hall-sensor/magnet assembly containing a samarium-cobalt magnet and a Hall-effect IC optimised to the magnetic circuit. The solid thermoset moulded plastic package has been designed specifically for high reliability in the harsh automotive environment. The two-wire device communicates the speed and direction of a ferrous target - typically a rotating gear - via a pulse-width-modulation (PWM) output protocol. The patented algorithms are designed to meet the special operational requirements of transmission applications, and the device is particularly adept at handling vibration without sacrificing maximum air-gap capability or creating an erroneous 'direction' pulse.

Even the higher angular vibration caused by engine cranking is completely rejected by the device. The advanced vibration detection algorithm systematically calibrates the sensor on the true rotation signals from the first three and a half teeth of the target and not on vibration, so that it always guarantees an accurate signal in running mode.

Patented running-mode algorithms also protect against air-gap changes, whether or not the target is in motion. Direction information is always available on the first magnetic edge after a direction change.

Other features include an internal current regulator for 2-wire operation, automatic gain control and reference adjustment circuitry, true zero-speed operation, and a defined power-on state. The device will operate over a wide voltage range, and 3-bit factory trimming provides tight pulse-width accuracy. Undervoltage lockout circuitry and ESD and reverse polarity protection are included.

The combination of advanced signal processing and innovative algorithms makes the ATS651LSH an ideal solution for a wide range of speed and direction sensing needs.

The device package, which measures only 8 mm diameter × 5.5 mm vertical (flat to flat) is lead (Pb) free, with a 100% matt tin-plated leadframe.

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