

## A3987: High-Voltage Microstepping Motor Driver IC

The new A3987 from Allegro MicroSystems Europe is a microstepping motor driver IC which combines an output drive capability of 50 V and  $\pm 1.5$  A with built-in translator circuitry and overcurrent protection.

The new device is designed to operate bipolar stepper motors in full, half, quarter and sixteenth step modes, and includes a fixed off-time current regulator which has the ability to operate in slow or mixed decay modes. Typical applications are in office equipment, medical and scientific instrumentation and industrial systems.

The translator is the key to the easy implementation of the A3987. Simply inputting one pulse on the step input causes the motor to take one microstep. There are no phase sequence tables, high-frequency control lines or complex interfaces to program, making the device an ideal fit for applications where a complex microcontroller is unavailable or over-burdened. It also requires only two control lines, compared to eight or ten for some devices.

The A3987 chopping control automatically selects the current decay mode (slow or mixed). When a 'step' signal occurs, the device determines if that step results in a higher or lower current in each of the motor phases. If the change is a higher current, the decay mode is set to slow decay. If it is a lower current, the decay mode will be set to 30.1% fast decay. This current decay control scheme results in reduced audible motor noise, increased step accuracy, and reduced power dissipation.

Internal synchronous rectification control circuitry is provided to improve power dissipation during PWM operation, and minimises the need for external components such as Schottky diodes. Internal circuit protection includes thermal shutdown with hysteresis, overcurrent protection, undervoltage lockout and crossover current protection. Special power-up sequencing is not required.

Low 'on' resistance DMOS outputs reduce power dissipation, and a 'sleep' mode reduces the power consumption to less than 120  $\mu$ A when the device is disabled.

The A3987 is supplied in a low profile (1.1 mm) 24L eTSSOP package (suffix 'LP') with exposed power tab.