Brushless DC Motor Pre-Driver Used Over Wide Current Range

Allegro MicroSystems, Inc. announces a complete three phase brushless DC motor pre-driver with outputs for direct high current gate drive of an all N-channel power MOSFET three phase bridge with a maximum supply voltage of 38 V. The A4938 includes Hall element inputs, a sequencer for commutation control, fixed off time pulse width modulation (PWM) current control and locked rotor protection. Output current is scalable with the choice of external MOSFETS. ENABLE, DIRECTION and BRAKE inputs can be used to control the motor, speed, position and torque. Output speed can be regulated using open drain FG1 output that changes state at each Hall transition.

This new pre-driver IC is targeted at the office automation, telecommunications, consumer, and industrial markets.

The external MOSFETS can be PWM'd with the ENABLE input or with the internal PWM current regulator. In both cases the A4938 synchronous rectification feature will turn on the appropriate MOSFET(s) during current decay to reduce power dissipation. The A4938 uses low cost Hall elements with noise filtering to prevent false commutation signals. A 5 V regulated supply output is provided to power the three HALL elements. Internal circuit protection includes thermal shutdown with hysteresis, under voltage lockout, over voltage protection with two voltage settings, locked rotor and dead time protection. Special power up sequencing is not required. Operating temperature range is -40°C to 85°C.

The A4938EETTR-T is supplied in a 5 mm × 5 mm 28-lead QFN package with exposed thermal pad. This small footprint package is lead (Pb) free with 100% matte tin leadframe plating. It is priced at $1.00 in quantities of 1,000.

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