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Configurable Mixed-Signal IC Adds High-Voltage Capability For Driving Motors

Dialog Semiconductor has expanded its popular GreenPAK family of configurable mixed-signal ICs by introducing the first high-voltage member of this family, the SLG47105, which is designed for motor drive applications. Also referred to as an HV PAK, the SLG47105 is a programmable mixed-signal matrix with four outputs with operating voltage up to 13.2 V and up to 2 A of current per output. This device is capable of driving two brushed dc motors, a single stepper motor, solenoid, or any other load used for industrial motor applications.

The SLG47105 combines mixed-signal logic and high-voltage H-bridge functionality in a tiny 2-mm x 3-mm QFN package. One time programmable (OTP) non-volatile memory (NVM) stores user-defined solutions in the form of interconnections of internal logic, I/O pins, and macrocells (see the figure). Put another way, the user creates their circuit design by programming the OTP NVM to configure the interconnect logic, the IO pins, the high voltage pins, and the macrocells of the SLG47105.

Integrated dual H-bridge/quad half-bridge functionality allows driving different loads up to 2 A per output with up to 13.2-V voltage. The SLG47105's advanced PWM macrocells provide the ability to drive multiple motors with different PWM frequencies and duty cycles.

Beyond standard protection features such as overtemperature, undervoltage and overcurrent protection, the SLG47105's configurable digital and analog resources allow the user to create a customized protection and motor control scheme with current or voltage regulation, stall detection or soft motor start to enable higher system reliability and more efficient battery usage.

The SLG47105 includes low power consumption functions including internal voltage references, power-on reset, an oscillator and more advanced digital resources, like pulse width modulators. The current consumption in standby mode for the entire chip is as low as 70 nA, which enables a longer battery life and helps to reduce the overall solution price, BOM, and PCB size and can achieve a lower overall system current consumption versus more discrete solutions used in the industry today, according the vendor.

"Adding high voltage capabilities to our GreenPAK product family opens up huge opportunities within the motor field," said John McDonald, vice president of marketing of Dialog's Configurable Mixed-Signal Business Unit. "With already close to 5 billion CMICs shipped, this new product will further accelerate GreenPAK adoption across a wider range of applications incorporating brushed and stepped motors, from industrial to consumer appliances and the smart home."

Unit pricing for the SLG47105 is as low as $0.433 in quantities of 100 (unprogrammed) or 3000 (programmed). For more information, see the HV PAK page, which includes links to a data sheet, a demo board video, application notes for a stepper motor driver and a smart lock motor driver, and other resources. The HV PAK was previewed earlier this year at CES.

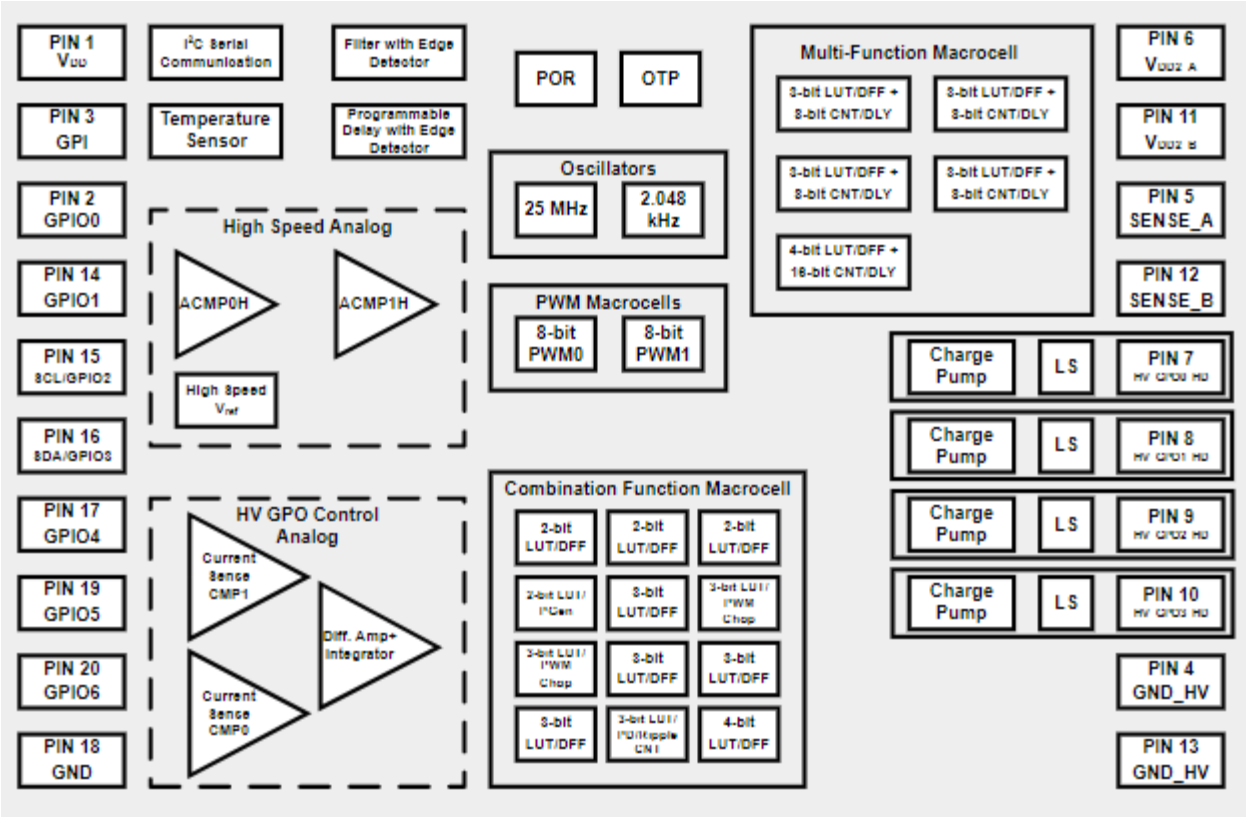

Figure. A member of the GreenPAK product family, the SLG47105 combines configurable, mixed-signal logic and high-voltage H-bridge functionality in a tiny 2- x 3-mm QFN. A single device is capable of driving two brushed dc motors, a single stepper motor, a solenoid, or any other load other load requiring up to 1.5 Arms per output, and an operating voltage up to 13.2 V.