High Power, Eight-Channel I²C-Controlled PMIC for Portable Processor Systems

MILPITAS, CA – August 3, 2010 – Linear Technology Corporation announces the LTC3589, a complete power management solution for portable processors such as i.MX, PXA, ARM, OMAP and other advanced portable microprocessor systems. The device features eight independent rails, with dynamic control and sequencing, in a compact QFN package. These rails supply power to the processor core, SDRAM, system memory, PC cards, always-on real time clock (RTC) and a variety of other functions. The LTC3589 contains three high current, high efficiency step-down regulators, a high current/high efficiency buck-boost regulator, and four low noise, low dropout linear regulators (LDOs). Supporting the multiple regulators is a highly configurable power sequencing capability, dynamic voltage scaling output voltage control, a pushbutton interface controller, as well as regulator control via an I²C interface with extensive status reporting and an interrupt output.

The LTC3589's three constant frequency current-mode buck switching regulators are internally compensated and provide up to 1A, 1A and 1.6A output currents, and have complete I²C-control, including selectable switching frequencies of 2.25MHz or 1.125MHz and phasing. The device's power-on default frequency is 2.25MHz with switch edge rate adjustment for reduced EMI. Each buck has a dynamically controlled DAC-based input reference and an external feedback pin to set the nominal output voltage range. Three operating modes can be set using the I²C interface: pulse-skipping (supports 100% duty cycle), Burst Mode® operation (advantageous for best efficiency at low output loads), or forced continuous (minimizes output voltage ripple at light loads and optimizes dynamic slew control between voltage output set points).

The LTC3589's single inductor, synchronous buck-boost converter generates a user-programmable output voltage rail from 2.5V to 5V. Utilizing a proprietary switching algorithm, the buck-boost converter maintains high efficiency and low noise operation with input

voltages above, below or equal to the regulated output rail. The buck-boost error amplifier uses a fixed 0.8V reference and the output voltage is set by an external resistor divider. Burst Mode operation is enabled through the I²C control registers. No external compensation components are required.

The LTC3589 also has four LDOs for low noise analog supplies, including three 250mA rails with different combinations of fixed, adjustable and I²C-selectable voltage options. The other LDO is an always-on 25mA supply with a resistor-programmable output voltage.

The LTC3589's versatile I²C serial port is used to control regulator enables, output voltage levels, dynamic voltage scaling and slew rate, operating modes and status reporting. Regulator start-up is sequenced by connecting regulator outputs to enable pins in the desired order or via the I²C port. System power-on, power-off and reset functions are controlled by a pushbutton interface, pin inputs, or I²C interface.

The LTC3589 is available from stock in a thermally enhanced, low profile (0.75mm) 40-pin 6mm × 6mm exposed pad QFN package. 1000-piece pricing starts at $4.65 each for the E grade and $5.35 each for the I grade, both with operating junction temperature range of -40°C to +125°C. An H grade version with operating junction temperature of -40°C to +150°C is also available, priced starting at $5.70 each in 1000-piece quantities. For more information, visit http://www.linear.com/3589.

Photo Caption: Eight Output, High Power 3 Buck + 1 Buck-Boost + 4 LDO PMICs for Portable Processors

Summary of Features: LTC3589

- Triple I²C Adjustable High Efficiency Step-Down Switching Regulators: 1.6A, 1A, 1A
- Dynamic Voltage Scaling & Slew Rate Control
- High Efficiency 1.2A Buck-Boost Switching Regulator
- Triple Low Noise 250mA LDO Regulators
- Always Alive 25mA LDO Regulator
- Flexible Pin-Strap Sequencing Operation
- I²C & Independent Enable Control Pins
- Power Good & Reset Outputs
- Selectable 2.25MHz or 1.12MHz Switching Frequency
- Pushbutton ON/OFF Control with System Reset
- 10uA Standby Current
- Thermally Enhanced, 40-Pin 6mm × 6mm × 0.75mm QFN

About Linear Technology

Linear Technology Corporation, a manufacturer of high performance linear integrated circuits, was founded in 1981, became a public company in 1986 and joined the S&P 500 index of major public companies in 2000. Linear Technology products include high performance amplifiers, comparators, voltage references, monolithic filters, linear regulators, DC-DC converters, battery chargers, data converters, communications interface circuits, RF signal conditioning circuits, uModule® products, and many other analog functions. Applications for Linear Technology's high performance circuits include telecommunications, cellular telephones, networking products such as optical switches, notebook and desktop computers, computer peripherals, video/multimedia, industrial instrumentation, security monitoring devices, high-end consumer products such as digital cameras and MP3 players, complex medical devices, automotive electronics, factory automation, process control, and military and space systems.

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