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# 7-Channel I²C-Controlled PMIC for High Power 1-Cell Li-Ion Systems

MILPITAS, CA – August 25, 2010 –Linear Technology Corporation announces the LTC3675, a highly integrated general-purpose power management solution for high power single cell Lithium-Ion/Polymer cell systems. The device features seven independent rails, with I²C control, flexible sequencing and fault monitoring in a compact 28mm² QFN package. The LTC3675 contains four high efficiency synchronous step-down regulators, a high current/high efficiency buck-boost regulator, a synchronous boost regulator, a dual-string 40V-LED driver and an always-on LDO. Pushbutton ON/OFF/RESET control, precision enable inputs and a power-on reset output provide flexible and reliable power-up sequencing. The LTC3675's I²C interface provides complete regulator control, status reporting and a maskable interrupt output. Quiescent current is only 16uA with all DC/DCs off to maximize battery run time.

The LTC3675's four constant frequency current-mode buck switching regulators are internally compensated, providing up to 1A, 1A, 500mA and 500mA output currents, respectively, with complete I²C control. Further, the buck power stages can be paralleled to deliver up to twice the output current with a single inductor. The buck regulators can operate in two different modes. In pulse-skipping mode, the regulator will skip pulses at light loads, but will operate at a constant frequency of 2.25MHz at higher loads. In Burst Mode® operation, the regulator will burst at light loads for best efficiency, and at higher loads will operate in constant frequency PWM mode for lowest noise performance. I²C may be used to control the device,

enabling mode of operation, feedback regulation voltage and switch slew rate. The bucks have forward and reverse current limiting, soft-start to limit inrush current during start-up, short-circuit protection and slew rate control for lower radiated EMI.

The LTC3675's buck-boost regulator is a 2.25MHz voltage mode regulator designed to deliver up to 1A load current for a typical programmed output voltage of 3.3V. The regulator can be enabled via its enable pin or via I²C. The mode of operation (Burst Mode or PWM), feedback regulation voltage and switch slew rate can all be controlled via I²C. The buck-boost regulator also features forward current limiting, soft-start to limit inrush current during start-up, short-circuit protection and slew rate control for lower radiated EMI. The LTC3675's boost regulator is designed to deliver up to 1A load current for a programmed output voltage of up to 5V. Boost DC/DC enable, mode of operation (Burst Mode or PWM), feedback regulation voltage and switch slew rate can all be controlled via I²C. The boost regulator has forward and reverse current limiting, soft start to limit inrush current during start-up, short-circuit protection, slew rate control for lower radiated EMI and true output disconnect when in shutdown.

The LTC3675's constant frequency, current mode 40V LED driver can regulate up to 25mA of current through each of two series 10-LED strings. LED enable, 60dB brightness control and up/down gradation are programmed using I²C. The LED driver can be configured as a general purpose high voltage boost converter with a 1.6A (typ) switch current limit. Given its high duty cycle operation, it can boost from below 3V to up to 40V output at 55mA.

The LTC3675 is available from stock in a thermally enhanced, low profile (0.75mm) 44-pin 4mm x 7mm QFN package. 1000-piece pricing starts at $5.05 each for the E grade, with an operating junction temperature range of -40°C to +125°C. For more information, visit www.linear.com/3675.

**Photo Caption:** 7-Output, 4 Buck + 1 Buck-Boost + 1 Boost + 40V-LED Driver PMIC

## Summary of Features: LTC3675

- Four Monolithic Synchronous Buck DC/DCs (1A/1A/500mA/500mA)
- Buck DC/DCs can be Paralleled to Deliver up to 2x Current with a Single Inductor
- Independent 1A Buck-Boost and 1A Boost DC/DCs
- Dual String I²C-Controlled LED Driver
- Always-On 25mA LDO
- I²C Programmable Output Voltage, Operating Mode & Switch Node Slew Rate for All DC/DCs
- I²C Read Back of DC/DC, LED Driver, Fault Status
- I²C Programmable $V_{IN}$ & Die Temperature Warnings
- Maskable Interrupts to Report DC/DC, $V_{IN}$ & Die Temperature Faults
- Pushbutton ON/OFF/RESET
- Low Quiescent Current: 16uA (all DC/DCs Off)
- Thermally Enhanced, 4mm x 7mm x 0.75mm 44-Lead QFN Package

## 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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