



## **Battery Back-Up System Manager Saves Space & Power & Offers Battery Backup Charge, “No-Loss” Calibration & Shutdown Modes**

MILPITAS, CA – May 28, 2008 – Linear Technology Corporation introduces the LTC4110, an autonomous multi-chemistry, single chip, high efficiency flyback battery charge and discharge manager for server, memory backup, medical equipment, and high reliability system applications. The LTC4110 features four operating modes: battery backup, battery charge, “no-loss” battery calibration and shutdown. Combining all these in a single IC saves significant board area compared to existing solutions.

The LTC4110 can provide a supply voltage to a system load from a main supply or battery and can also charge a battery, thereby providing an uninterruptible power source for the system. The IC is capable of supplying voltages above or below the input supply rail, allowing the designer to optimize the battery configuration independent of input supply considerations. When the main supply is present, the LTC4110’s PowerPath™ control feature provides power to the system load and, if needed, preferentially and simultaneously charges the battery. If the main supply fails, the LTC4110 uses the battery as a power source through low loss switches to continue providing a supply voltage to power the system. The low loss battery calibration mode discharges the battery (through a high efficiency flyback converter) into the system load, thus eliminating wasted heat and energy. Shutdown mode disconnects the battery from the load to preserve capacity. In addition it offers the ability to ship the end product with a fully charged battery with minimal drainage.

The LTC4110 supports multiple battery chemistries: Li-Ion/Polymer, Nickel and lead acid, and is compatible with supercapacitors. Multiple LTC4110s can be combined to form a redundant battery backup system or increase the number of battery packs to achieve longer backup run times. The IC provides support for both standard and Smart Battery packs. If the optional SMBus/I<sup>2</sup>C interface is used, the host may access internal status, control the 3 GPIO

pins as desired, and support battery capacity and gas gauge calibration to verify the battery’s ability to support the load. The GPIO pins can also be configured as status outputs on power up.

Other features of the LTC4110 include programmable charge/calibration current up to 3A with  $\pm 3\%$  accuracy, wide backup battery supply range of 2.7V to 19V, wide input supply range of 4.5V to 19V, over- and under-battery voltage protection, adjustable battery float voltage with precision charge voltage of  $\pm 0.5\%$ , and optional temperature-qualified charging with a thermistor input. A “no-heat” calibration state is provided to assure the battery is maintaining charge. During this calibration state, the energy from the battery is sourced to the load rather than being dissipated as heat.

The LTC4110 is housed in a low-profile (0.75mm) 38-pin 5mm x 7mm QFN package and is guaranteed for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ . 1,000-piece pricing starts at 9.25 each.

**Photo Caption:** Battery Backup System Manager for Multi-Chemistry Batteries & SuperCaps


### **Summary of Features: LTC4110**

- Supports Li-Ion/Polymer, Lead Acid, NiMH/NiCd Batteries and Super Capacitors
- Standalone for Li-Ion, SLA, and SuperCaps
- Optional Smart Battery Support
- Automatic PowerPath Control
- Charge and Discharge Battery Voltage Can Extend Above or Below Input Supply Voltage
- Over- and Under-Battery Voltage Protection
- Adjustable Battery Float Voltage
- Optional SMBus/I<sup>2</sup>C Support Allows Battery Capacity Calibration Operation with Host
- “No Heat” Battery Calibration
- Precision Charge Voltage:  $\pm 0.5\%$
- Programmable Charge/Calibration Current: Up to 3A with  $\pm 3\%$  Accuracy
- Optional Temperature Qualified Charging
- Wide Backup Battery Supply Range: 2.7V to 19V
- Wide Input Supply Range: 4.5V to 19V
- Low-Profile (0.75mm) 38-Lead (5mm x 7mm) 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. For more information, visit [www.linear.com](http://www.linear.com).

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