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4A Multi-Cell, Multi-Chemistry Battery Charger Controller in Compact 16mm² Package

MILPITAS, CA – June 26, 2008 – Linear Technology Corporation introduces the LTC4009, a fast-charge 4A capable, high efficiency switchmode battery charger controller for multiple battery chemistries which minimizes power dissipation without compromising board space. The LTC4009 supports Li-Ion/Polymer, NiMH, NiCd and sealed lead acid battery chemistries in multi-cell configurations. AC adapter current limiting maximizes the charge rate for a given fixed input power level, allowing the end product to operate at the same time the battery is charging without complex load management algorithms. The IC operates from input voltages up to 28V and is intended for applications including portable computers, portable instruments, and battery backup systems.

The LTC4009's synchronously rectified, buck switching topology drives all n-channel MOSFETs and enables efficiencies as high as 90% at 4A. Final float voltage accuracy is specified at $\pm 0.5\%$ and charge current is programmable with accuracy of $\pm 4\%$. The LTC4009's quasi-constant frequency PWM architecture guarantees no audible noise operation and minimizes filtering needs, while the high operating frequency of 550kHz allows the use of small inductors and capacitors. Improved non-overlap control keeps efficiency high as external power FET turn on/off times may vary with temperature and supplier. The LTC4009 consumes $<20\mu\text{A}$ in shutdown, increasing battery run time in portable applications. For safety and autonomous charge control, the IC includes battery float voltage over-voltage protection, reverse charge current protection, charge current monitoring, soft start, ac adapter present indication, and current limit indication.

The LTC4009 is housed in a compact 20-lead, low-profile (0.75mm) 4mm x 4mm QFN package. It is guaranteed for operation from 0°C to 85°C ambient temperature. Pricing starts at \$2.95 each in 1,000-piece quantities.


Photo Caption: 4A Multi-Chemistry Switchmode Battery Charger

Summary of Features: LTC4009

- High Efficiency PWM Switchmode Battery Charger Controller
- Multiple Battery Chemistries & Multi-Cell Configurations Supported:
 - Li-Ion/Polymer, NiMH, NiCd, SLA
- Charge Current up to 4A
- 550kHz Switching Frequency Enables Small External Components
- $\pm 0.5\%$ Output Float Voltage Accuracy
- Programmable Charge Current: $\pm 4\%$ Accuracy
- No Audible Noise with Ceramic Capacitors
- Synchronous Rectification: High Efficiency up to 92% @ 2A
- Enhanced Non-Overlap Control of External Power FETs
- Wide Input Supply Voltage Range: 6V to 28V
- Wide Output Battery Voltage Range: 3V to 28V
- Indicator Outputs for AC Adapter Present, Charging, C/10 Current Detection and Input Current Limiting
- Analog Charge Current Monitor
- Micropower Shutdown
- Compact, Low-Profile (0.75mm) 4mm x 4mm QFN-20 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.

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