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Programmable 2A 2-Cell Supercap Charger with Automatic Cell Balancing in a Compact 9mm^2 Package

MILPITAS, CA – March 1, 2010 – Linear Technology Corporation introduces the LTC4425, the latest in a family of 2-cell supercapacitor chargers for addressing high peak power, data backup and "dying gasp" needs in portable and data storage applications. The device employs a linear CC-CV architecture with thermal limiting to charge two supercapacitors in series to a programmable output voltage from a Li-Ion/Polymer battery, a USB port, or other 2.7V to 5.5V current-limited supply.

The LTC4425 features two operating modes: charge current profile (normal) mode and LDO mode. The device's charge current profile mode charges the top of the supercap stack to the input voltage V_{IN} with a charge current that varies inversely with the input-to-output voltage differential in order to present excessive heating. The LDO mode charges the stack to an externally programmed output voltage with a fixed charge current that is also externally programmable. Charge current is resistor programmable up to 2A (3A peak), and each capacitor is protected against overvoltage by internal shunts (2.45V/2.7V selectable). The LTC4425's onboard current-limited ideal diode features extremely low 50mOhm on resistance to prevent back-driving of $V_{IN,}$ making it suitable for a wide variety of high peak power battery and USB-powered equipment, industrial PDAs, portable instruments and monitoring equipment, power meters, supercap backup circuits and PC card/USB modems.

The LTC4425's automatic cell balancing feature maintains equal voltages across both cells, eliminating the need for balancing resistors while protecting each supercapacitor from overvoltage damage while minimizing current drain on the capacitors. The IC operates with a very low 20uA quiescent current when the output voltage is in regulation and draws only 2uA in shutdown from either V_{IN} or V_{OUT}, whichever is higher. The basic charging circuit requires only six external components and is highly compact, offered in a tiny 9mm^2 package footprint as well as a leaded package. Other key features include a V_{IN} power fail indicator and continuous monitoring of V_{IN} to V_{OUT} current via the PROG pin. Additional protection features include current and thermal limiting that reduces charge current in cases of excessive temperature.

The LTC4425 is available in two compact, thermally enhanced packages; a 12-lead, low-profile (0.75mm) 3mm x 3mm DFN package and a 12-lead MSOP package. Operation from -40°C to 85°C operating junction temperature is guaranteed. The LTC4425 is in stock, priced starting at $2.25 each in 1,000-piece quantities. For more information, visit www.linear.com.

Photo Caption: 2A 2-Cell Linear Supercap Charger with Auto Cell Balancing

Summary of Features: LTC4425

- Linear Constant-Current, Constant-Voltage, (CC-CV) Charging of Two Series Supercapacitors
- 50mOhm Ideal Diode from V_{IN} to V_{OUT}
- Smart Charge Current Profile Limits Inrush Current
- Automatic Cell Balancing Prevents Capacitor Overvoltage During Charging
- Programmable Output Voltage (LDO Mode)
- Programmable V_{IN} to V_{OUT} Current Limit
- Continuous Monitoring of V_{OUT} Current via PROG Pin
- Low Quiescent Current: 20uA
- V_{IN} Power Fail Indicator
- Programmable Charging Current (Up to 2A Continuous), 3A Peak Current Limit
- Selectable 2.45V or 2.7V Max Voltage per Cell (4.9V/5.4V Supercap Max Top-Off Voltage)
- Tiny Application Circuit, All Components <1mm High
- Compact, Low-Profile (0.75mm) 3mm × 3mm 12-Lead DFN Package & MSOP-12 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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