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High Efficiency I²C USB Power Manager & Li-Ion Charger Provides Digital Control & Status Readback

MILPITAS, CA – December 1, 2008 – Linear Technology Corporation introduces the LTC4099, an autonomous I²C controlled, high efficiency power manager, ideal diode controller and Li-Ion/Polymer battery charger for portable USB powered devices such as media players, digital cameras, PDAs, PNDs and smart phones. Parameters including input current limit, charge current, termination current, and float voltage can be programmed via I²C. The I²C port also allows the user to read back system status information. The LTC4099's switching PowerPath™ topology seamlessly manages power flow between a wall adapter or USB port and the device's battery while preferentially providing power to the system load. For automotive, Firewire, or other high-voltage applications, the LTC4099 provides Bat-Track™ control of a Linear Technology companion switching regulator, maximizing battery charger efficiency and minimizing power dissipation. With companion chip input voltages ranging up to 38V (60V transients), the LTC4099 provides a seamless transition between USB and higher voltage power sources.

The LTC4099 prevents damage caused by accidental application of high voltage on the USB input with an overvoltage protection (OVP) circuit – protection up to 68V requires only an external NFET/resistor combination. The LTC4099's "instant-ON" operation ensures system load power at plug-in even with a dead battery. Its onboard ideal diode guarantees that ample power is always available to V_{OUT} even if there is insufficient power at the LTC4099's two input pins. The device's ideal diode controller can be used to drive the gate of an optional PFET, reducing the impedance between the load and the battery to 30mOhm or less.

The LTC4099's full-featured single-cell Li-Ion/Polymer battery charger allows the load current to exceed the current drawn from the USB port while conforming to USB load specifications. For fast charging, the IC's switching input stage converts nearly all of the 2.5W available from the USB port to current, enabling up to 600mA charge current or 700mA system load current from a 500mA limited USB port. There is also 1.5A charge current available when

wall powered. For improved safety margin, an integrated over-temperature battery conditioning circuit can optionally reduce the battery voltage in case both high battery temperature and high battery voltage occur simultaneously. Further, the charger includes thermal limiting, automatic recharge, stand-alone operation with automatic charge termination and fixed duration safety timer, low voltage trickle charging, bad battery cell detection and a thermistor input for temperature-qualified charging. An additional feature of the LTC4099 is a suspend LDO that prevents battery drain when a device is connected to a suspended USB port.

The LTC4099 is housed in an ultra-thin (0.55mm) 20-pin 3mm x 4mm QFN package and is guaranteed for operation from -40°C to 85°C. 1,000-piece pricing starts at 2.80 each.

Photo Caption: High Efficiency I²C USB Power Manager & Battery Charger with OVP


Summary of Features: LTC4099

- Switching Regulator with Bat-Track Adaptive Output Control Makes Optimal Use of Limited Power Available from USB Port to Charge Battery and Power Application
- I²C Port for Optimal System Performance and Status Information
- Input Overvoltage Protection (up to 68V)
- Bat-Track Control of External Step-Down Switching Regulator Maximizes Efficiency from Automotive and Other High Voltage Sources
- Instant-On Operation with Low Battery
- Ideal Diode Seamlessly Connects Battery when Input Power is Limited
- Overtemperature Battery Conditioner
- Full Featured Li-Ion/Polymer Battery Charger
- 1.5A Maximum Charge Current with Thermal Limiting from Wall Adapter
- 700mA Maximum Current Available to System Load from a 500mA USB Port
- Slew Control Reduces Switching EMI
- Ultra-Thin (0.55mm) 20-Lead 3mm x 4mm 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.

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