15W I²C Power Manager Charges LiFePO₄ Cells at 3.5A for High Power Density Portable & Battery Back-up Systems

MILPITAS, CA – March 14, 2012 – Linear Technology Corporation introduces the LTC4156, a high power, I²C controlled, high efficiency PowerPath™ manager, ideal diode controller and Lithium Iron Phosphate ($LiFePO_4$) battery charger for single-cell devices such as portable medical and industrial devices, backup devices and other high power density battery-powered applications. The IC is designed to efficiently transfer up to 15W from a variety of sources while minimizing power dissipation and easing thermal constraints. The LTC4156's switching PowerPath topology seamlessly manages power distribution from two input sources such as a wall adapter and USB port to the device's rechargeable $LiFePO_4$ battery while preferentially providing power to the system load when input power is limited.

Because power is conserved, the LTC4156 allows the output load current to exceed the current drawn by the input supply, maximizing use of the available power for battery charging without exceeding the input supply power delivery specifications. For example, when powered from a 5V/2A wall adapter, the IC's switching regulator efficiently transfers over 90% of the available 10W, enabling up to 2.4A charge current for faster charge times. Unlike ordinary switching battery chargers, the LTC4156 features instant-on operation to ensure that system power is available at plug-in even with a deeply discharged battery. USB OTG (On-the-Go) support provides a 5V supply back to the USB port without any additional components.

A simple 2-wire I²C port provides broad adjustability for many system control parameters including charge current, input current (including USB 2.0 and 3.0 compatible settings) and float voltage (3.45V/3.55V/3.60V/3.80V). The communications bus also allows the LTC4156 to provide status information such as battery temperature, input supply status, charger status and fault status.

The LTC4156's autonomous full-featured single-cell $LiFePO_4$ battery charger is capable of up to 3.5A charge current with fifteen charge current settings. The charger includes automatic recharge, bad cell detection, programmable safety timer, thermistor temperature qualified charging, programmable end-of-charge indication/termination and programmable interrupt generation.

The LTC4156's dual input, priority multiplexing overvoltage protection (OVP) circuit prevents any damage from accidental application of high voltage. Its ideal diode controller guarantees that ample power is always available to V_{OUT} even if input power is insufficient or absent. To minimize battery drain when a device is connected to a suspended USB port, an LDO from V_{BUS} to V_{OUT} provides the allowable USB suspend current to the application. To eliminate battery drain between manufacture and sale, a ship-and-store feature reduces the already low battery standby current to nearly zero. The LTC4156 compliments the LTC4155, which offers the same feature set for Li-Ion/Polymer battery-based systems.

The LTC4156 is housed in a low profile (0.75mm) 28-pin 4mm x 5mm QFN package and is guaranteed for operation from -40°C to 125°C. 1,000-piece pricing starts at $4.07 each. For more information, visit www.linear.com/product/LTC4156

Photo Caption: High Efficiency I^2C Power Manager & 3.5A $LiFePO_4$ Battery Charger with OVP & USB OTG

Summary of Features: **LTC4156**

- High Power, High Efficiency Switching $LiFePO_4$ Battery Charger Capable of 3.5A Charge Current
- Monolithic Switching Regulator Makes Optimal Use of Limited Input Power Available
- Dual Input Overvoltage Protection Controller
- Priority Multiplexing for Multiple Inputs
- I^2C/SMBus Control for Optimal System Performance & Status Information
- Instant-On Operation with Low Battery
- Battery Ideal Diode Controller for Power Management
- USB OTG Power Delivery from the Battery to the USB Port
- Full Featured Lithium Iron Phosphate Charger with 4 Float Voltage Settings (3.45V/3.55V/3.60V/3.80V)
- 3.5A Maximum Charge Current from Wall Adapter
- Supports USB 2.0 & USB 3.0 Specifications
- Low Profile (0.75mm) 28-Lead 4mm × 5mm QFN Package

About Linear Technology

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for three decades. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems. Linear Technology produces power management, data conversion, signal conditioning, RF and interface ICs, µModule®subsystems, and wireless sensor network products. For more information, visit www.linear.com

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