



Tiny USB PowerPath Manager Withstands 60V Inputs

MILPITAS, CA – June 11, 2007 – Linear Technology Corporation introduces the LTC4090, an autonomous linear PowerPath[™] manager, ideal diode controller and stand-alone high input voltage battery charger for portable USB devices. For high efficiency charging, the switching front-end topology accommodates various inputs, including high voltage power sources up to 38V (60V max withstand capability) such as 12V regulated/unregulated AC-DC wall adapters, FireWire ports or automotive power. In addition, the IC accepts low-voltage power sources such as 5V wall adapters, USB ports and single-cell Li-Ion/Polymer batteries. The LTC4090 features linear PowerPath control that provides power to the device while charging its single-cell Lithium battery from the USB bus or a wall adapter power supply. To comply with USB current limit specifications, the LTC4090 automatically reduces battery charge current as the system load current increases. To ensure that a fully charged battery remains topped off when the bus is connected, the IC directs power to the load through the USB bus rather than extracting power from the battery. Once all power sources are removed, current flows from the battery to the load through an internal 200mOhm low loss ideal diode, minimizing voltage drop and power dissipation. Onboard control circuitry is provided to drive an optional external PFET to reduce the overall ideal diode impedance below 50mOhm if required by the application, providing even higher efficiency operation.

The LTC4090's front-end switching regulator features Bat-Track[™] adaptive output control, greatly improving the efficiency of its 1.5A-capable battery charger as the internal switching regulator's output voltage automatically tracks the battery voltage by 300mV. Instant-on operation ensures system power is available as soon as the input supply is available, even with a dead or missing battery. The battery charger's float voltage is preset at 4.2V with guaranteed 1.0% accuracy from -40°C to 85°C. Charge current is easily programmed using a single resistor. For battery pre-conditioning and qualification, fully discharged cells are automatically trickle charged at 10% of the programmed current until the cell voltage exceeds 2.9V. Total charge time for

charge termination is programmed by an external capacitor, and a C/10 charge current detection output is provided. Additional functions include 5x/1x USB current limiting, thermal regulation, an NTC thermistor input for temperature-qualified charging, automatic recharging of the battery, reverse current blocking, and under-voltage lockout.

The LTC4090 is housed in a low-profile (0.75mm) tiny 22-pin 3mm x 6mm DFN package, and is guaranteed for operation from -40°C to 85°C. 1,000-piece pricing starts at \$3.25 each.


Photo Caption: USB Power Manager and High Voltage Li-Ion/Polymer Charger

Summary of Features: LTC4090

- Single-IC USB Power Manager, Ideal Diode Controller & High Voltage Battery Charger
- Seamless Transition Between Input Power Sources: Lithium Battery, USB, and High Voltage 6V-38V (60V max) External Supply
- 2A Output High Voltage Buck Regulator with Bat-Track Adaptive Output Control
- Standalone High Efficiency 1.5A Battery Charger with Thermal Limiting
- 5x/1x USB Current Limiting
- Instant-on Operation Ensures Full System Power
- 200mOhm Internal Ideal Diode plus Optional External Ideal Diode Controller Provides Low-Loss Power Path when External Supply/USB not Present
- Load Dependent Charging from USB Input Guarantees Current Compliance
- Preset 4.2V Charge Voltage with 1.0% Initial Accuracy over Temperature
- Timer Termination with C/10 Charge Current Detection Output
- NTC Thermistor Input for Temperature Qualified Charging
- Compact, Low Profile (0.75mm) 3mm x 6mm DFN-22 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, 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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