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## **4mm x 7mm PMIC Integrates Linear Power Manager & Charger, Three Buck Regulators, LED Driver, OVP & Pushbutton Control**

MILPITAS, CA – July 29, 2009 – Linear Technology Corporation announces the LTC3577, LTC3577-1, LTC3577-3 and LTC3577-4, highly integrated multi-function power management integrated circuit (PMIC) solutions for portable Li-Ion/Polymer battery applications. The LTC3577/-X integrates a USB-compatible linear PowerPath™ manager, a standalone battery charger, overvoltage protection, 10-LED driver, pushbutton on/off control, three high efficiency synchronous buck regulators and two LDOs in a low-profile 4mm x 7mm QFN package. The LTC3577-1 and LTC3577-4 feature a 4.1V battery float voltage for improved battery cycle life and additional high temperature safety margin, while the LTC3577 and LTC3577-3 include a standard 4.2V battery float voltage for maximum run time. The LTC3577-3 and LTC3577-4 are tailored for SiRF Atlas IV chipsets. These ICs are highly suited for portable device applications including personal navigation devices (PNDs), digital media/video broadcasting (DMB/DVBs), digital/satellite radio, media players, universal remotes, photo viewers and portable medical and industrial devices.

The LTC3577/-X's PowerPath manager with automatic load prioritization seamlessly manages the transition between multiple input sources to power the load, while delivering up to 1.5A battery charge current from a wall adapter supply or up to 500mA charge current from a USB port. The charger is compatible with inputs up to 5.5V (7V absolute maximum transient for added robustness). The ICs "instant-on" operation ensures system load power even with a fully discharged battery. Autonomous operation simplifies design, eliminating the need for an external microprocessor for charge termination. An overvoltage protection (OVP) controller enables up to 30V protection for the Wall/USB input, while a high temperature battery voltage reduction circuit improves battery safety and reliability. To preserve battery energy during long periods of inactivity or to reset the product in the event of a software lockup, the LTC3577/-1 contains a hard reset function enabled via pushbutton control, placing the IC into an ultra-low quiescent current state that draws <10uA and disables all power supplies and power paths.

The LTC3577/-1 can control an external high-voltage buck regulator to achieve high efficiency Bat-Track™ charging and power path control from a high voltage source, reducing power dissipation. The internal 200mOhm ideal diode, plus an optional external ideal diode controller provide a low loss power path to the load when input current is limited or unavailable.

The LTC3577/-X's three integrated synchronous buck regulators feature 100% duty cycle operation and are capable of delivering output currents of 800/500/500mA respectively, with adjustable output voltages down to 0.8V. A high 2.25MHz switching frequency allows the use of tiny low cost capacitors and inductors less than 1mm in height. Internal low  $R_{DS(ON)}$  switches enable efficiencies as high as 95%, further maximizing battery run time. In addition, I<sup>2</sup>C-controlled Burst Mode® operation optimizes efficiency at light loads with a quiescent current of only 20uA per regulator (<1uA in shutdown). Furthermore, the regulators are stable with ceramic output capacitors, achieving very low output voltage ripple.

Additional features of the LTC3577/-X include a 40V series backlight 10-LED driver with I<sup>2</sup>C controlled 60dB brightness (1000:1 dimming range) and gradation control, pushbutton on/off control with system reset, and dual 150mA current limited LDOs.

The LTC3577/-X is available from stock in a compact, low-profile (0.75mm) 4mm x 7mm QFN-44 package. Pricing starts at \$4.95 each for 1,000-piece quantities. For more information, visit [www.linear.com](http://www.linear.com).

**Photo Caption:** USB Compatible Linear Power Manager + Battery Charger + Triple Sync Buck + OVP + 10-LED Driver + Pushbutton On/Off Control + Dual LDOs

### **Summary of Features: LTC3577, LTC3577-1, LTC3577-3 & LTC3577-4**

- Complete Multi-Function PMIC: Linear Power Manager, Li-Ion/Polymer Battery Charger, Three Synchronous Buck Regulators, 10-LED Driver, Dual 150mA LDOs, Pushbutton On/Off Control
- Thermally Enhanced, Low Profile (0.75mm) 44-Lead 4mm x 7mm QFN Package

#### **POWER MANAGER & BATTERY CHARGER**

- Charge Current Programmable up to 1.5A from Wall Adapter Input
- Seamless Transition Between Input Power Sources: Li-Ion/Polymer Battery, USB, 5V Wall Adapter or High Voltage Buck Regulator with Bat-Track Adaptive Output Control
- 200mOhm Internal Ideal Diode Plus Optional External Ideal Diode Controller Provides Low Loss Power Path from Battery to Load
- Standalone Autonomous Operation
- High Temperature Battery Voltage Reduction Circuit for Improved Battery Safety & Reliability
- Instant-On Operation with Discharged Battery

### **DC/DCs**


- Three High Efficiency Synchronous Buck Regulators with Burst Mode Operation
- Buck Regulator Adjustable Output Voltage Range: 0.8V to  $V_{BAT}$
- Buck Regulator Output Currents: 800mA, 500mA, 500mA
- Dual 150mA Current Limited LDOs

### **Other Features**

- 40V Series Backlight 10-LED Driver with 60dB Brightness Control & Gradation via I<sup>2</sup>C
- Overvoltage Protection for USB/Wall Input (up to 30V)
- Pushbutton On/Off Control with System Reset
- Battery Float Voltage: 4.2V (LTC3577, LTC3577-3), 4.1V (LTC3577-1, LTC3577-4)
- SiRF Atlas IV Chipset Compatible (LTC3577-3, LTC3577-4)

## **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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