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## **USB Power Manager, Buck & LDO PMIC Consumes only 12uA $I_Q$ with All Outputs On**

MILPITAS, CA – September 22, 2009 – Linear Technology Corporation announces the LTC3553, a micropower multifunction power management integrated circuit (PMIC) solution for portable Li-Ion/Polymer battery-based applications. The LTC3553 integrates a USB-compatible linear PowerPath™ manager, a stand-alone battery charger, a high efficiency synchronous buck regulator, a low dropout linear regulator and pushbutton controller in an ultrathin (0.55mm) 3mm x 3mm QFN package. A pin-selectable standby mode reduces battery drain current to just 12uA while keeping all outputs in regulation, extending battery run time. The LTC3553 is well suited for low power portable device applications, including personal navigation devices (PNDs), media players and handheld medical and industrial devices.

The LTC3553's PowerPath manager, with automatic load prioritization, seamlessly manages the transition between multiple input sources to power the load, while delivering up to 400mA battery charge current from a USB port or a 5V wall adapter input. The input current limit is pin-selectable and internally set (no external resistor is required). The LTC3553 is compatible with inputs up to 5.5V (7V maximum transient for added robustness). The device's "instant-on" operation ensures immediate system load power when USB or a 5V wall supply is available, even with a fully discharged battery. Autonomous operation simplifies design, eliminating the need for an external microprocessor for charge termination. The internal 240mOhm ideal diode provides a low loss power path to the load when input current is limited or unavailable. An NTC function is also available for temperature-qualified charging.

The LTC3553's integrated synchronous buck regulator delivers up to 200mA output current with a regulated output voltage that is adjustable down to 0.8V. The 1.125MHz switching frequency reduces output ripple while allowing the use of tiny low cost capacitors and inductors less than 1mm in height. Low  $R_{DS(ON)}$  internal switches enable buck efficiencies as high as 93%, maximizing battery run time. Buck efficiency is optimized in Burst Mode<sup>®</sup> operation, drawing only 22uA of supply current, while standby mode can be used for “keep-alive” applications, reducing the buck's quiescent current to only 1.5uA (<1uA in shutdown).

The low dropout (LDO) regulator provides up to 150mA output current. Regulated output voltage is adjustable down to 0.8V, independent of the buck output. The LDO's power input is accessible as a pin, allowing LDO efficiency to be increased in some applications by powering the LDO from the buck output. Both the buck and LDO are stable with tiny ceramic output capacitors, eliminating the need for larger, expensive tantalum or electrolytic capacitors.

The integrated pushbutton controller enables one-button power up and power down sequencing as well as a status signaling output indicating the button state. The controller also provides a Hard Reset state for software lockup recovery or to enable an ultralow battery drain state (typically 0.2uA) for the device.

The LTC3553 is available from stock in a compact, ultralow-profile (0.55mm) 3mm x 3mm UTQFN-20 package. Pricing starts at \$2.25 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 + Sync Buck + LDO

### Summary of Features: LTC3553

- Complete Multifunction PMIC: Linear PowerPath Manager, Li-Ion/Polymer Battery Charger, Synchronous Buck Regulator, LDO, Pushbutton Control
- Ultralow Quiescent Current: 12uA (TYP) in Standby Mode with All Outputs On
- Thermally Enhanced, Low Profile (0.55mm) 20-Lead 3mm x 3mm UTQFN Package

#### **POWERPATH MANAGER & BATTERY CHARGER**


- Charge Current Programmable up to 400mA from USB or 5V Wall Adapter Input, with Thermal Limiting
- Seamless Transition Between Input Power Sources: Li-Ion/Polymer Battery and USB or 5V Wall Adapter
- 240mOhm Internal Ideal Diode Provides Low Loss Power Path from Battery to Load
- Stand-alone Autonomous Operation
- Instant-On Operation with Discharged Battery

#### **REGULATED OUTPUTS**

- High Efficiency 200mA Synchronous Buck Regulator with Burst Mode Operation
- Buck Regulator Adjustable Output Voltage Range: 0.8V to V<sub>BAT</sub>
- LDO: 150mA Output Current, Output Voltage Down to 0.8V

### 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<sup>®</sup> 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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