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Switching Power Manager with USB On-The-Go & Overvoltage Protection in a Compact 12mm² Footprint

MILPITAS, CA – May 6, 2009 – Linear Technology Corporation announces the LTC4160 and LTC4160-1, the latest members in a family of power manager ICs for single-cell Li-Ion/Polymer battery-based applications, including media players, personal navigation devices, digital cameras, PDAs and smart phones. The LTC4160/-1 features a bidirectional switching power manager which can power an application and charge the battery from USB. Operating in reverse, the same switching regulator can take power from the battery to generate 5V and deliver up to 500mA for USB On-The-Go (OTG) applications without any additional components. The LTC4160/-1 includes automatic load prioritization when powered from USB, input overvoltage protection, a standalone battery charger, and an ideal diode, all in a compact, ultralow profile (0.55mm) 3mm x 4mm UTQFN package. The LTC4160-1 offers a 4.1V battery float voltage, allowing high temperature safety margin, while the LTC4160 features a 4.2V final charge voltage for optimized battery run time.

The on-chip switching regulator also features programmable input current limits of 100mA and 500mA for enhanced USB compatibility, as well as a wall adapter input current limit setting up to 1.2A. For fast charging, the LTC4160/-1 converts nearly all of the 2.5W available from the USB port to charging current, enabling up to 600mA of charge current from a 500mA limited USB supply and up to 1.2A of charge current from a wall adapter. The device provides an overvoltage protection (OVP) control circuit that prevents damage to its input from the

accidental application of high transient voltages. The OVP circuit can protect the USB port even when the IC is providing power for USB OTG.

The LTC4160/-1's PowerPath™ control with automatic load prioritization seamlessly manages power flow between a variety of input power sources such as a wall adapter or USB port and the Li-Ion/Polymer battery while preferentially providing power to the system load. The IC's "Instant-ON" operation ensures system load power even with a fully discharged battery. The LTC4160/-1's switching regulator features Bat-Track™ adaptive output control which greatly improves the efficiency of its battery charger by maintaining the output voltage approximately 300mV above the battery voltage. An internal 180mOhm ideal diode plus optional external ideal diode controller provide a low loss power path from the battery to the load when input power is limited or unavailable. The LTC4160/-1's stand-alone battery charger features autonomous operation that simplifies design and eliminates the need for an external microprocessor for charge termination. To preserve battery energy, the LTC4160/-1 draws <4uA from the battery in suspend mode and <8uA in ideal diode mode.

The LTC4160 and LTC4060-1 are available from stock in a compact, ultrathin (0.55mm) 3mm x 4mm 20-pin QFN package. Pricing starts at \$2.85 each for 1,000-piece quantities. For more information, visit www.linear.com.

Photo Caption: Switching Power Manager with USB OTG + Battery Charger + OVP


Summary of Features: LTC4160 and LTC4160-1

- Switching Power Manager with USB OTG & OVP, Li-Ion/Polymer Battery Charger
- Bidirectional Switching Regulator Makes Optimal Use of Limited Power Available from USB Port & also Provides a 5V Output for USB On-The-Go
- Overvoltage Protection Guards Against Damage from Inadvertent Application of High Voltage

- Bat-Track Adaptive Output Control for Efficient Charging
- “Instant-On” Operation even with Fully Discharged Battery
- Maximum Charge Current Programmable up to 1.2A from Wall Adapter, 600mA from USB Port
- Battery Float Voltage: 4.2V (LTC4160), 4.1V (LTC4160-1)
- Low Battery Powered Quiescent Current (8µA)
- 180mOhm Internal Ideal Diode Plus Optional External Ideal Diode Controller Provides Low Loss Power Path when Input Power is Limited or Unavailable
- Thermally Enhanced, Ultra-Low Profile (0.55mm) 20-pin 3mm x 4mm UTQFN 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.

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