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400mA Synchronous Step-Up DC/DC Converter with Maximum Power Point Control & 250mV Start Up for Energy Harvesting Applications

MILPITAS, CA – October 18, 2010 – Linear Technology announces the [LTC3105](#), a high performance, synchronous boost converter that incorporates maximum power point control (MPPC) and starts up with inputs as low as 250mV. The LTC3105 operates over an extremely wide input range of 0.225V to 5V, making it ideal for harvesting energy from high impedance alternative power sources, including photovoltaic cells, thermoelectric generators (TEGs) and fuel cells. The LTC3105's internal 400mA synchronous switches maximize efficiency while its Burst Mode[®] operation offers quiescent current of only 24uA, further optimizing converter efficiency over all operating conditions. A user-programmable MPPC set point maximizes the energy that can be extracted from any power source without collapsing its internal voltage.

The LTC3105 is ideally suited to power wireless sensors and data acquisition applications. Surplus or ambient energy can be harvested and then used to generate system power in lieu of traditional wired or battery power, which may be expensive or impractical. Typically, these applications require very low average power, but require periodic pulses of higher load current. For example, the LTC3105 can be used in wireless sensor applications where the power load is extremely low when the sensor is in standby mode, interrupted by periodic high load bursts, when the circuitry is powered up to take measurements and transmit data.

The LTC3105 offers an auxiliary LDO that delivers up to 6mA of output current to power external microcontrollers and sensors while the main output is charging. Once fully charged, the main output can deliver voltages as high as 5.25V with up to 100mA of output current. It can also regulate V_{OUT} even when V_{IN} is greater than or equal to V_{OUT} , offering further design flexibility. In shutdown, the LTC3105 offers output disconnect, isolating V_{IN} from V_{OUT} , requiring only 10uA of quiescent current. The combination of the LTC3105's 3mm x 3mm DFN package (or MSOP-12) and very small external components offers a very compact solution for energy harvesting applications.

The LTC3105EDD is available in a 10-lead 3mm x 3mm DFN package and the LTC3105EMS is available in an MSOP-12 package. Prices start at \$2.70 each for 1,000-piece quantities. Both are available from stock. For more information, visit www.linear.com/3105.


Photo Caption: Low Voltage Step-Up DC/DC Converter with Maximum Power Point Control

Summary of Features: LTC3105

- Low Start-Up Voltage: 250mV
- Maximum Power Point Control for High Impedance Sources
- Wide V_{IN} Range: 0.225V to 5V
- Auxiliary 6mA LDO Regulator
- Burst Mode[®] Operation: $I_Q = 24\mu A$
- Output Disconnect & Inrush Current Limiting
- $V_{IN} > V_{OUT}$ Operation
- Anti-Ringing Control
- Soft Start
- Automatic Power Adjust
- Power Good Indicator
- 10-Lead 3mm x 3mm DFN or MSOP-12 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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