



Piezoelectric Energy Harvesting Power Supply

MILPITAS, CA – January 7, 2010 – Linear Technology announces the LTC3588-1, a complete energy harvesting solution optimized for low energy sources, including piezoelectric transducers. The LTC3588-1 integrates a low-loss, full-wave bridge rectifier with a high efficiency buck converter to harvest ambient vibrational energy via piezoelectric transducers and then convert it to a well-regulated output to power application microcontrollers, sensors, data converters and wireless transmission components. The LTC3588-1 operates from an input voltage range of 2.7V to 20V, making it ideal for a wide array of piezoelectric transducers, as well other high output impedance energy sources. Its high efficiency buck DC/DC converter delivers up to 100mA of continuous output current or even higher pulsed loads. Its output can be programmed to one of four (1.8V, 2.5V, 3.3V or 3.6V) fixed voltages to power a wireless transmitter or sensor. Quiescent current is only 950nA with the output in regulation (at no load), maximizing overall efficiency.

The LTC3588-1 is designed to interface directly with a piezoelectric or alternative AC power source, rectify a voltage waveform and store harvested energy in an external storage capacitor while dissipating any excess power via an internal shunt regulator. An ultralow quiescent current (450nA) undervoltage lockout (ULVO) mode with a wide hysteresis window enables charge to accumulate on the storage capacitor until the buck converter can efficiently transfer a portion of the stored charge to the output. In its no load sleep state, the LTC3588-1 regulates the output voltage, consuming only 950nA of quiescent current while continuously

charging the storage capacitor. The LTC3588-1 requires minimal external components and is packaged in either a 3mm x 3mm DFN or a thermally enhanced MSOP-10 package, providing a compact solution footprint for a broad range of energy harvesting applications.

The LTC3588EDD-1 is available in a 3mm x 3mm DFN package and the LTC3588EMSE-1 is available in a thermally enhanced MSOP-10 package. Pricing starts at \$2.95 each for 1,000-piece quantities. Industrial temperature grade versions, the LTC3588IDD-1 and LTC3588IMSE-1, are also available, priced starting at \$3.47 each for 1,000-piece quantities. All versions are available from stock. For more information, visit www.linear.com.

Photo Caption: The LTC3588-1 Piezoelectric Energy Harvesting Power Supply

Summary of Features: LTC3588-1

- 950nA Input Quiescent Current (Output in Regulation – No Load)
- 450nA Input Quiescent Current in UVLO
- 2.7V to 20V Input Operating Range
- Integrated Low-Loss Full-Wave Bridge Rectifier
- Selectable Output Voltages of 1.8V, 2.5V, 3.3V, 3.6V
- Up to 100mA of Output Current
- High Efficiency Integrated Hysteretic Buck DC/DC
- Input Protective Shunt – Up to 25mA Pull-Down at $V_{IN} \geq 20V$
- Wide Input Undervoltage Lockout (UVLO) Range
- Available in 10-Lead MSE & 3mm x 3mm DFN Packages

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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