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## **NEXTREME AND INFINITE POWER SOLUTIONS ANNOUNCE THIN-FILM THERMAL CHARGER APPLICATION**

**Storing energy harvested from waste heat using thermoelectric enables an alternative energy source for autonomous applications...**

DURHAM, N.C. and Denver Colo. (November 4, 2009) — Nextreme Thermal Solutions, the leader in microscale thermal and power management products for the electronics industry, and Infinite Power Solutions, Inc. (IPS), an innovative manufacturer of solid-state, rechargeable, thin-film micro-energy storage devices, today announced the development of a thermal charger with the ability to continuously recharge the IPS THINERGY™ Micro-Energy Cell (MEC) using an eTEG thermoelectric power generator from Nextreme. Thin-film thermoelectric technology enables thermal charging where energy scavenging from thermal sources is combined with solid-state, rechargeable thin-film battery technology to provide an alternative energy source for a variety of autonomous, self-powered applications.

The prototype thermal charger uses an array of 16 HV14 modules in power generation mode to provide the 4.1 volts of electricity needed to charge the MEC to a fully charged state in approximately 20 minutes. At only 0.5 millimeters high and each smaller than a sunflower seed, four of these tiny HV14 power generators can replace a AA battery. A demonstration video can be viewed at [www.nextreme.com/thermalcharger](http://www.nextreme.com/thermalcharger).

Nextreme's eTEG™ HV14 has demonstrated output power levels of >16mW at  $\Delta T$  of 70°C and >45mW at  $\Delta T$  of 120°C. With modules measuring just 1.8mm x 1.5mm, the eTEG HV14 has corresponding output power densities of ~ 0.6 and 1.6W/cm<sup>2</sup>. Nextreme's eTEG devices generate electricity via the Seebeck Effect, where an electrical current is produced from a temperature gradient across the device.

THINERGY MECs are the world's most powerful batteries for their size and outperform all other micro-batteries (rechargeable and primary), including lithium coin cells, printed batteries and all other thin-film batteries. Unlike conventional batteries, these ultra-thin and rechargeable MECs can be solder attached directly to printed circuit boards (PCBs), or deeply embedded (buried) within the layers of a PCB. The MECs

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can also be embedded into integrated circuit (IC) packaging and multi-chip modules, as well as systems in package. The THINERGY MEC is provided to supply stored energy for use by the application during periods when the heat source is not available or is intermittent.

"We're delighted to be working with IPS on energy harvesting and storage solutions," said Jim Mundell, senior vice president & general manager of Nextreme. "Their strengths - extremely thin devices, small footprints, and ability to get so much power and lifetime energy out of such a small space" - align very much with ours. That's a real advantage for systems and sub systems designers who are looking for alternative sources of energy in small footprints."

Applications for thermal charging from waste heat include scavenging heat from a solar panel as a supplemental source of electricity, using heat produced by an engine during combustion to charge a battery, or providing power for a remote sensor.

"THINERGY MECs are the ideal energy storage solution for autonomous, self-powered sensor networks," said Tim Bradow, IPS' vice president of business development. "With the addition of Nextreme's thermoelectrics as a continuous charge source, our combined solutions substantially increase product lifetimes in the field and reduce the total cost of ownership by eliminating the prohibitive cost of battery replacement. Together we can ensure "instant on" power solutions based on energy harvesting, dramatically reduce the size of the power supply required, and enhance the performance of embedded devices for decades of maintenance-free operation."

More information on the eTEG HV14 power generator can be found at [www.nextreme.com/power](http://www.nextreme.com/power). Contact Nextreme at 3908 Patriot Dr., Suite 140, Durham, NC 27703-8031; call (919)-597-7300; or e-mail [info@nextreme.com](mailto:info@nextreme.com). More information on the THINERGY Micro Energy Cell product line can be found at <http://www.infinitepowersolutions.com/product/thinergy>. Contact IPS at 11149 Bradford Road, Littleton, Colorado 80127 or call (303) 749-4754.

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**About Nextreme Thermal Solutions™, Inc.**

Nextreme Thermal Solutions designs and manufactures microscale thermal and power management products for the electronics, telecommunications, semiconductor, consumer, and aerospace/government industries. The company uses breakthrough thin-film thermoelectric material to embed cooling, temperature control and power generation capabilities into the widely accepted copper pillar bumping process used in high-volume electronic packaging. Nextreme's headquarters and manufacturing facility are based near Research Triangle Park, North Carolina. Visit [www.nextreme.com](http://www.nextreme.com).

**About Infinite Power Solutions, Inc.**

Infinite Power Solutions, Inc. (IPS)—a U.S.-based, clean-technology company—is the global leader in developing, marketing and manufacturing solid-state, rechargeable, thin-film micro-energy storage devices for a variety of micro-electronic applications. The company's THINERGY™ Micro-Energy Cells and INFINERGY™ Micro Power Modules uniquely enable ambient energy harvesting solutions to create miniature, autonomous, perpetual power supplies to address the growing demand among customers in the wireless sensor, active RFID, powered smart card, medical device, consumer electronics, automotive and civil/military/aerospace markets. Founded in 2001, IPS is privately held with corporate headquarters and manufacturing in Littleton, Colo. Visit [www.InfinitePowerSolutions.com](http://www.InfinitePowerSolutions.com).

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