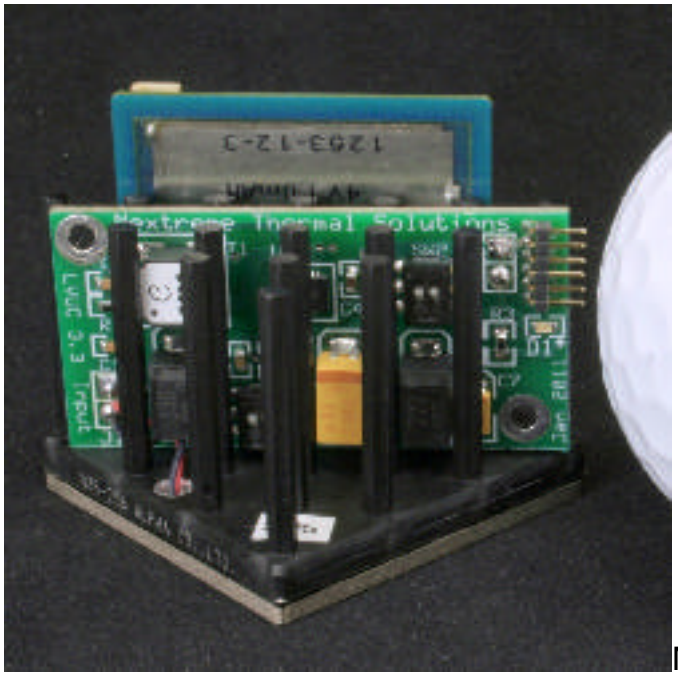
Wireless Power Generator With On-board Energy Storage



Nextreme Thermal Solutions, the leader in micro-scale thermal and power generation solutions, today introduces the Thermobility Wireless Power Generator WPG-1S evaluation kit with on-board energy storage using the INFINERGY D-MPM101 micro power module from Infinite Power Solutions. The WPG-1S uses innovative solid-state thin-film thermoelectric technology to convert heat into electricity for a variety of self-powered wireless applications.
Thermobility uses differences in temperature to enable power anywhere there is an adequate heat source and eliminates the need to use traditional wired power sources or replaceable batteries. When paired with wireless transmitters, the Thermobility solution can provide electric power for years of maintenance-free operation, thus expanding the possibilities for new wireless sensor and security applications in industrial control, transportation, automotive and building management. Thermobility is the ideal power source for wireless transmission applications.

As the second in a series of wireless power generators from Nextreme, the Thermobility WPG-1S uses the INFINERGY D-MPM101, a development micro power module from Infinite Power Solutions (IPS) that provides efficient battery management, near loss-less energy storage, and output regulation. The D-MPM101 integrates IPS' ultra-thin and rechargeable THINERGY® solid-state micro-energy cells (MECs) to supply up to 2.0 mAh of stored energy for use by an application during periods when the heat source is not available or is intermittent. Reliable power output of up to 200 mW at 25°C is possible at a regulated 3.3V.

The WPG-1S is about the size of a golf ball and consists of a pin-fin heat sink, a

custom circuit board, Nextreme's eTEG(TM) HV56 thermoelectric power generator module and a metal attachment plate that is applied to the desired heat source.

The WPG-1S also incorporates a Linear Technologies LTC®3108 ultralow voltage step-up converter and power management chip to provide up to 1mW of electrical power, and operates at temperature differentials as low as 15-20 degrees K relative to ambient. Larger temperature differences can generate significantly more power.

"The WPG-1S is the ideal energy harvesting solution for autonomous, self-powered sensor networks," said Dave Koester, Nextreme's vice president of engineering. "With the addition of IPS' INFINERGY power module, our Thermobility solutions can store energy and provide on-demand power while reducing the total cost of ownership by eliminating the prohibitive cost of battery replacement."

The WPG-1S evaluation kit is designed for ease of use with any flat-surface heat source and can be customized for pipes and other non-flat surfaces. For simple bench-top testing, the WPG-1S can be placed directly on a laboratory grade hotplate with temperature control. For evaluation with other surfaces, the attachment plate can be mated with either thermal grease for normal horizontal application or double-stick thermal pad for vertical mounting.

Electrical power output connections can be made using the on-board 6-pin connectors or a two-wire pigtail connected to the 6-pin connector. The 6-pin connector mates directly to the Texas Instruments eZ430 wireless target board, making the WPG-1S an ideal wireless power source for the eZ430 development platform.

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