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Energy harvesting made easy: Silicon Labs, Linear Technology and Würth Elektronik enable fastest designs of battery-less products with the Energy Harvesting Solution To Go Kit

October 14th, 2014

Silicon Labs, Linear Technology and Würth Elektronik - leading manufacturers of energy efficient active and passive electronic components - present the development platform [Energy Harvesting Solution To Go Kit](#).

The [Energy Harvesting Solution To Go Kit](#) provides easy access to energy harvesting technologies which helps developers to apply them in future battery less products.

The kit has following advantages:

Developers receive a complete solution: from harvesting of the energy, to energy management, to storage to the application. The transfer of this solution to the development of a battery-less product is made easy by providing the selection of the right components, schematics and software examples. The application of the highest efficient components in the market allow utilization of the precious harvested energy for the application.

The two basic parts of the kits are an energy harvesting board and the Giant Gecko starter kit.

There are four voltage converters of Linear Technology on the multi-source energy harvesting board. These are optimized for the different energy sources like for solar, electromagnetic, piezo-electric or thermal energy converters. The energy harvesting board offers two integrated energy sources to start the evaluation immediately: A solar cell (32mm x

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50mm) and a thermo-generator (40mm x 40mm). Additionally, one can add further external energy sources to the board.

Linear Technology offers the LTC3588 for AC sources up to 20V for piezo-electric and inductive energy generators. The IC LTC3108 supports very small input voltages of a few mV which are usually supplied by thermo-electric generators (TEG). Solar cells would be utilized ideally with the LTC3105, because this IC provides „maximum power point control“ (MPPC). The LTC3459, together with the LTC2935, is a unique solution, because they can harvest energy from very small solar cells with interior light.

The user can select the appropriate energy converter on the energy harvesting board by setting a jumper. Optionally, a larger capacity could be selected if the energy harvesting cannot be performed well continuously.

The Giant Gecko Starter Kit is the second part of this development kit. The board contains the most energy friendly microcontroller, EFM32 Giant Gecko, with the most comprehensive feature set: ARM Cortex M3, 48MHz, 1024KB Flash, 128KB RAM, USB, LCD Control, Low Energy Sense, etc.. The EFM32GG990F1024 can perform complex tasks in the Deep Sleep Mode with a few microamperes and consumes only 200µA/MHz, in active mode. The following features of the starter kits can be used: 160-segment LCD display, 2 programmable buttons, a touch slider, ambient light sensor, an inductive-capacitive metal sensor, 32MB NAND Flash and an 0.03F super capacitor to evaluate the integrated backup power domain. The programming and debugging of the on board MCU is support by the integrated “Segger” J-Link interface.

All necessary development tools, code examples, software libraries and application notes can be found in Silicon Labs Simplicity Studio. One part of the Simplicity Studio is the energy Aware Profiler. The Profiler

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helps to display the current consumption and to create an energy profile of each software function by getting data from the on-board Advanced Energy Monitor and the “Segger” debugger. Thus, energy bugs of the application can be found easily.

The Giant Gecko Starter Kit can be connected by a 20 pin expansion header to the energy harvesting board. One can connect all starter kits of the EFM32 family – which consist of 240 compatible parts (4KB-1024KB Flash, 24-120pins) – to the energy harvesting board by this expansion header.

The highly efficient passive components of Würth Elektronik are integrated on the energy harvesting board, as well as on the Giant Gecko Starter Kit. The coupled power inductors, WE-EHPI, deserve particular notice. They prove their efficiency based on a very low resistance (mOhm) of each winding and a core especially developed for a rugged environment. In addition, a very efficient EMI suppression is realized by adding SMD ferrites at each plug contacts. Würth Elektronik’s tact switches survive at least 1 million use cycles. The LED series, WE-SMCW, display the current status with an angle of radiation of 140° and a brightness of 110 mcd.

The microcontroller is preprogrammed with one example. This helps to experience very quickly how easy it is to realize a design with energy harvesting, thanks to the availability of innovative standard products. The energy which is harvested from a small solar cell in a room, or by the heat of the palm of a hand, is sufficient enough to run an application permanently.

The [Energy Harvesting Solution To Go Kit](#) is available through Würth Elektronik.

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Developers can experience the [Energy Harvesting Solution To Go Kit](#) live during electronica from November 11-14 in München at the booths of Silicon Labs, Linear Technology and Würth Elektronik eiSos.
 Please find more information at <http://www.we-online.com/harvest>

About Würth Electronics Midcom:

Würth Electronics Midcom is a global leader in the design and manufacture of custom magnetics. A standard line of magnetics is offered, including inductors, ferrites, chokes, and EMI shielding materials. Recently, the electromechanical and interconnect line was added to the product offering, which includes Board-to-Board, Wire-to-Board, Terminal Blocks, and Input/Output Communication.

Customers in Asia, Europe and the Americas are supported through a local direct technical sales network, regional design and applications engineers and manufacturing based in the People's Republic of China.

Our standard lines and custom-made transformers are used around the world in LED lighting, smart grid and utility metering, industrial controls, telecom (CPE and CO), home automation, and home appliances.

Würth Electronics Midcom offers all catalog products in stock. Free samples are offered to customers on connectors and both catalog and custom magnetics.

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