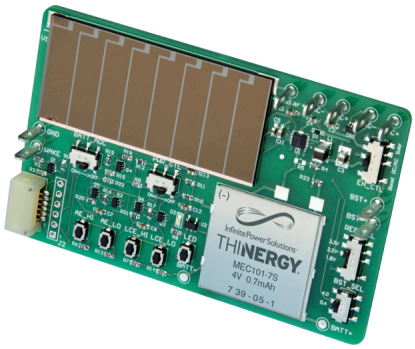
Infinite Power Solutions®

PRODUCT BRIEF

IPS-EVAL-EH-01 Energy Harvesting Evaluation Kit

Summary of Features

- Autonomous Energy Harvesting & Storage Platform for Microelectronics
- Integrated THINERGY® solid-state, rechargeable, Micro Energy Cell for efficient energy storage
- Integrated Power Management IC to manage energy harvesting and storage
- Accepts AC & DC charge sources up to 5V & 150mW
- Integrated boost converter enables low voltage energy sources >200mV as charge sources
- Output regulation supplies up to 100mW (continuous) from the integrated MEC
- Three regulated output voltages: 1.8V, 2.3V, 3.3V
- Unique low energy output regulation mode reduces active quiescent currents to <75nA for output currents <100µA
- Output header interfaces with common low power development tools available from Microchip, TI and others



- Integrated unique “off-active” event driven activation system enabling 1nA quiescent current operation between target system active periods
- Integrated amorphous silicon solar panel suitable for efficient charging in low light conditions
- Inputs for external AC or DC energy sources

General Description

The THINERGY® IPS-EVAL-EH-01 is an evaluation kit that demonstrates universal energy harvesting, efficient energy storage and ultra-low power output regulation in a convenient form factor tailored for the development of autonomously powered systems. Harvested energy is efficiently stored in the integrated and industry-leading THINERGY solid-state, rechargeable, thin-film Micro-Energy Cell (MEC). The MEC, also known as a Solid-State Battery (SSB), is the ideal energy storage device with unparalleled performance and is able to last the lifetime of the application with no battery replacement required. The MEC enables deeply embedded applications to run autonomously and maintenance-free for decades, providing the lowest cost of ownership power solution for low power microelectronic systems.

In addition, the IPS-EVAL-EH-01 incorporates the Maxim MAX17710 Energy Harvesting Power Management IC (PMIC), and an amorphous silicon solar panel from Sanyo/Amorton. This self-charging, self-regulated platform provides an example energy harvesting and energy storage system intended to power small microelectronic devices such as remote wireless sensors that require an autonomous or perpetually powered energy source without maintenance. The MAX17710 PMIC manages poorly regulated, highly variable inputs typical of energy-harvesting sources such as solar, RF, thermal-electric, or vibration.

These input energy sources can be connected to the IPS-EVAL-EH-01 to provide charge energy for the integrated MEC. Additionally, the user or connected target system can select the required regulated output voltage from the three available options of 1.8V, 2.3V and 3.3V.

The IPS-EVAL-EH-01 is intended to be easily connected to a target system, such as a microcontroller demonstration kit, to create a stand-alone, self-powered system that does not require external power or conventional batteries that require frequent replacement. The system can operate in three power modes: High power regulation, Low power regulation, and Off-active mode.

In high power regulation mode, system quiescent current is well below 1µA and output regulation voltages are tightly controlled, suitable for full power system operation. In low power regulation mode, the quiescent current is typically below 75nA with output regulation less tightly regulated, suitable for real time clock, low power processor sleep states and memory backup conditions. In off-active mode, the target system is completely isolated from the integrated energy storage device (MEC), producing an industry leading 1nA quiescent drain. In the off-active state, the system can accept input charge energy and can respond to input events allowing the system to wake to full power and operation on significant input events.