



Power Management Controller with Energy Harvester Interface

General Description

The EM8500 is an integrated power management solution for low power applications. It is specifically designed for efficient operation with a variety of DC harvesting sources including thermal electric generators (TEG) or photovoltaic (solar) sources in the μW to mW range.

To maximize harvesting efficiency the EM8500 integrates a programmable maximum power point tracking controller.

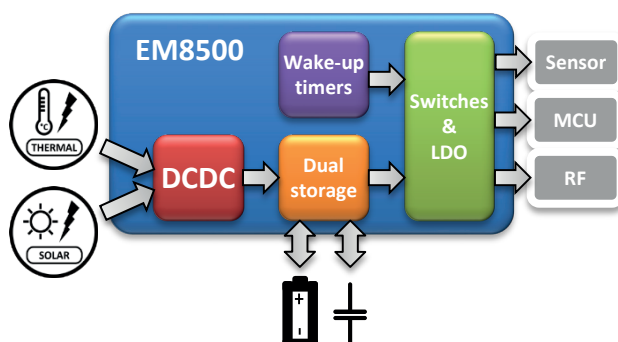
The EM8500 is capable of operating with a variety of energy elements as secondary storage, namely re-chargeable batteries, super-capacitors or conventional capacitors.

When using a non-rechargeable primary battery the EM8500's on-board PMU offers a mechanism to extend battery life when assisted by a harvesting element.

To perform granular power management of the application, the EM8500 integrates four independent supply outputs and a sleep mode offering the capability to switch off part or all the supplies.

Applications

- | Energy harvesting equipped platforms
 - Solar charging
 - Thermo-electrical generator harvesting (TEG)
- | Wearable systems
- | Beacons and wireless sensor networks
- | Industrial and environmental monitoring
- | Battery operated platforms



Main Features

- | Smart Power Management
 - Ultra low quiescent current regulator (25nA)
 - 3 auxiliary supplies with high current drive capability
 - Programmable supply output level
 - Wake-up function – internal counter and external event
- | Ultra low input voltage and power
 - Coldstart : 0.3V / 3 μW
 - Operating 0.1V / 1 μW
- | Ultra low power solution
 - 15 nA on battery in protection mode
 - 125 nA supplying low power applications
- | Fast cold-start start-up
 - Fast start-up due to dual storage elements
 - STS: Short Term Storage LTS: Long Term Storage
 - Maintain STS in configurable voltage window when LTS is lower than minimum application voltage
- | MPPT
 - Fully embedded Maximum Power Point Tacking (MPPT), configurable for solar cell or TEG by EEPROM without any external component
- | USB Charger
 - Configurable current charger
 - Maintain application supply from USB power
- | Primary Cell Life Time Extension
 - Configurable to extend life time of non-rechargeable battery on LTS (with harvester assistance)
- | Flexible interface
 - SPI or I2C interfaces used for controlling
- | Configuration by E2PROM
 - No external components required
 - Configuration default values stored in E2PROM
- | Power control
 - Stop charging when harvester power is under a minimum configurable limit
 - Configurable under and over voltage battery protection
- | Luxmeter
 - Harvester current sensor with multiple ranges