ACT8846

Product Brief, 22-Oct-12

Advanced PMU for Multi-core Application Processors

FEATURES

INTEGRATED POWER SUPPLIES

- **Four DC/DC Step-Down (Buck) Regulators**
  - **2 x 2.8A, 2 x 1.5A**
- **Five Low-Noise LDOs**
  - **2 x 150mA, 3 x 350mA**
- **Three Low-Input Voltage LDOs**
  - **1 x 150mA, 2 x 350mA**
- **One Low IQ Keep-Alive LDO**
- **Backup Battery Charger**

SYSTEM CONTROL AND INTERFACE

- **Four General Purpose I/O with PWM Drivers**
- **I²C Serial Interface**
- **Interrupt Controller**

SYSTEM MANAGEMENT

- **Reset Interface and Sequencing Controller**
  - **Power on Reset**
  - **Soft / Hard Reset**
  - **Watchdog Supervision**
  - **Multiple Sleep Modes**
- **Thermal Management Subsystem**

APPLICATIONS

- **Tablet PC**
- **Mobile Internet Devices (MID)**
- **E-books**
- **Personal Navigation Devices**
- **Smart Phones**

GENERAL DESCRIPTION

The ACT8846 is a complete, cost effective, and highly-efficient *ActivePMU™* power management solution optimized for the power, voltage sequencing and control requirements of Rockchip RK3066 application processor family.

The ACT8846 features four fixed-frequency, current-mode, synchronous PWM step-down converters that achieve peak efficiencies of up to 97%. These regulators operate with a fixed frequency of 2.25MHz, minimizing noise in sensitive applications and allowing the use of small external components. These buck regulators supply up to 2.8A of output current and can fully satisfy the power and control requirements of the multi-core application processor. Dynamic Voltage Scaling (DVS) is supported either by dedicated control pins, or through I2C interface to optimize the energy-per-task performance for the processor. This device also include eight low-noise LDOs (up to 350mA per LDO), one always-on LDO and an integrated backup battery charger to provide a complete power system for the processor.

The power sequence and reset controller provides power-on reset, SW-initiated reset, and power cycle reset for the processor. It also features the watchdog supervisory function. Multiple sleep modes with autonomous sleep and wake-up sequence control are supported.

The thermal management and protection subsystem allows the host processor to manage the power dissipation of the PMU and the overall system dynamically. The PMU provides a thermal warning to the host processor when the temperature reaches a certain threshold such that the system can turn off some of the non-essential functions, reduce the clock frequency and etc to manage the system temperature.

The ACT8846 is available in a compact, Pb-Free and RoHS-compliant TQFN66-48 package.

PRODUCT OPTIONS

Block	Function	Output Voltage	Capability
REG1	Step-Down DC/DC	0.6V to 3.9V	1500mA
REG2	Step-Down DC/DC	0.6V to 3.9V	2800mA
REG3	Step-Down DC/DC	0.6V to 3.9V	2800mA
REG4	Step-Down DC/DC	0.6V to 3.9V	1500mA
REG5	Low-Noise LDO	0.6V to 3.9V	150mA
REG6	Low-Noise LDO	0.6V to 3.9V	150mA
REG7	Low-Noise LDO	0.6V to 3.9V	350mA
REG8	Low-Noise LDO	0.6V to 3.9V	350mA
REG9	Low-Noise LDO	0.6V to 3.9V	350mA
REG10	Low Input-Voltage LDO	0.6V to 3.9V	150mA
REG11	Low Input-Voltage LDO	0.6V to 3.9V	350mA
REG12	Low Input-Voltage LDO	0.6V to 3.9V	350mA
REG13	Always-ON LDO	0.6V to 3.9V	50mA

FUNCTIONAL BLOCK DIAGRAM