

TI Designs

AM437x Low Power Suspend to RAM Mode with LPDDR2 Design Guide



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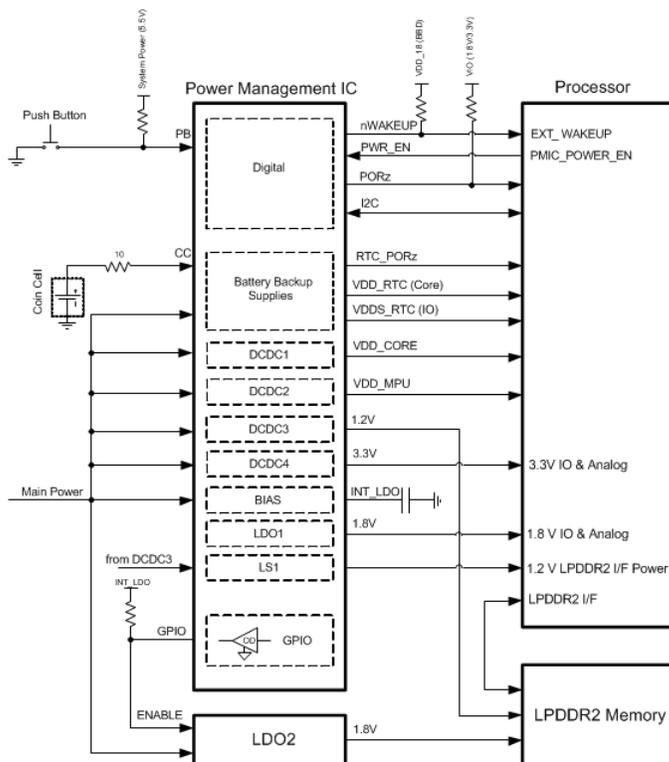
Design Description

This low power mode implementation realizes processor power consumption less than 0.1 mW while keeping LPDDR2 memory in self refresh consuming ~ 1.6 mW. The system solution is comprised of AM437x Sitara processor, LPDDR2 memory and TPS65218 power management IC and optimized for new low power mode along with support for legacy low power modes. The processor power is minimized by turning off all the processor power supplies except RTC power supply. System power state transitions including power supply control can be performed by single interface signal (PMIC_PWR_EN signal) with PMIC register programming.

Design Features

- Suspend to RAM with the lowest system power mode
 - AM437x in RTC-only mode
 - TPS65218 in suspend state
 - LPDDR2 in self refresh
- System can resume back to the state it was before suspending
- RTC-only suspend power consumption
 - AM43x + TPS65218: < 0.1 mW
 - Typical 2Gb LPDDR2: 1.6 mW

- Suspend Events:
 - By programming RTC registers
 - By setting up the RTC alarm
- Resume Events:
 - RTC alarm goes off
 - PMIC push button or AC power detection
- Resume Time
 - < 300 msec hardware latency
 - < 1 sec for software to resume to previous state (depending on application use case)



Design Resources

- Reference Schematics

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