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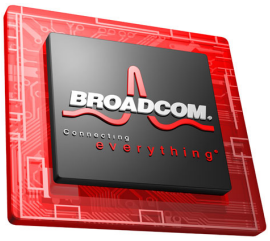
BCM59035 PRODUCT Brief



MOBILE POWER MANAGEMENT UNIT

FEATURES

- Two fully integrated programmable 500-mA step-down switching regulators with best-in-class efficiency over a wide load range
- Dynamic voltage management support for the Core switching regulator
- Fifteen high-performance programmable Low Dropout regulators (LDO)
- Fully featured Wall and USB chargers for single-cell Li-Ion/Li-Polymer batteries
- USB On-The-Go (OTG) VBUS boost regulator and detection comparators compliant with USB OTG 1.3 standard
- Battery-presence detection and temperature-qualified charging through battery package temperature monitoring
- Die temperature thermal regulation loop for safe battery charging
- Automatic charging source selection
- Battery monitoring with highly accurate coulomb counter-based fuel gauge
- Programmable CC/CV backup battery charger
- 100-/400-kHz I^2C-compatible (BSC) serial interface
- Low-power 32-kHz oscillator
- Supervisory RESET block
- Real-Time Clock (RTC) providing alarm functions with wake-up control
- Accessory detection input
- Watchdog timer
- Two programmable current sources for vibrator and/or LED applications
- Two general-purpose input/output (GPIO) ports
- 6-kV ESD protection on accessible pins
- 121-pin 6-mm x 6-mm BGA package

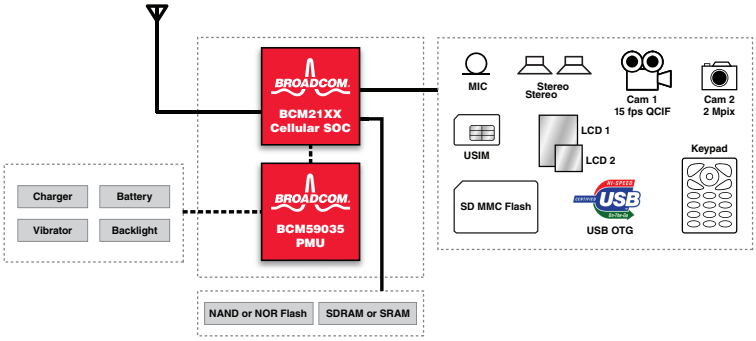
SUMMARY OF BENEFITS

- High level of integration reduces the power management solution size and overall system cost
- Multimode step-down switching regulators offer best-in-class efficiency
- Switching regulators' 2-MHz high-operating frequency enables the use of lowest profile and smallest footprint components
- Output voltage programming through OTP and serial interface for all switching regulators and LDOs offers flexibility and enables policy-driven dynamic power management
- Extended system active/idle mode operations time is achieved through high-efficiency, low-quiescent current, and ECO mode operation
- Charger input voltage up to 18V enables support of a wide range of AC adapters
- Programmable start-up sequencing for higher reliability and flexibility of system operation
- High-performance, noise-free linear charger with fast/precharge charge modes
- Highly accurate battery state-of-charge reporting provided by fuel gauge

APPLICATIONS

- When paired with the wide range of Broadcom cellular basebands, System-on-a-Chip (SOC), and Mobile Multimedia solutions, the BCM59035 provides a total system solution for fully featured EDGE and 3G handsets and a full range of mobile handheld chipsets including BCM2153 HSDPA SOC, BCM2154 WEDGE SOC, BCM21331 EDGE SOC, and BCM282X Application Processor.

Mobile Handset Power and Management Battery Platform



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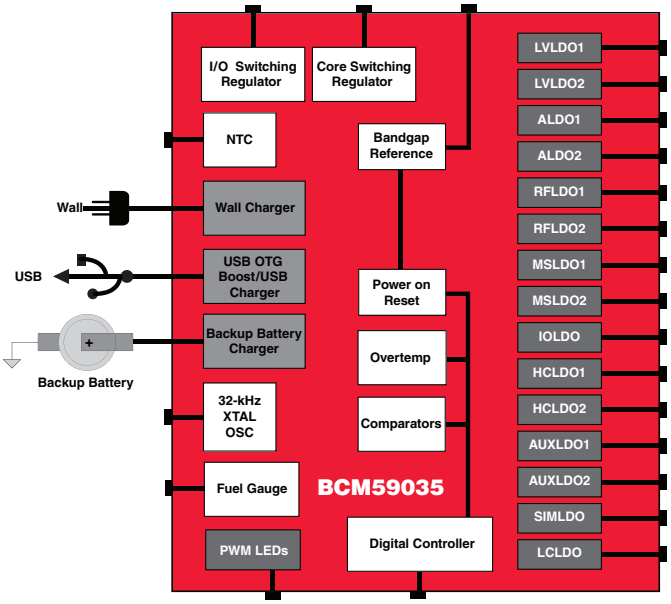
OVERVIEW



BCM59035 Block Diagram

The BCM59035 Power Management Unit (PMU) is a highly integrated complete power management and battery management solution optimized for EDGE, WEDGE, and HSDPA chip sets. The BCM59035 contains a fully featured, host-independent wall and USB linear charger for Li-ion/Li-polymer batteries, USB OTG VBUS regulator and comparators, two high-efficiency synchronous buck regulators, fifteen high-performance LDOs, a backup battery charger, a Real-Time Clock, two programmable current sources (PWMLEDs) to power up LEDs, two GPIO ports, and a fuel gauge. The BCM59035 can be controlled via a 100-/400-kHz I²C-compatible (BSC) interface. An external host controller can access BCM59035 BSC registers to read or program the internal blocks.

The two switching regulators (switchers) provide power to the core and I/O circuit blocks of the Baseband IC. The regulators' operating modes and output voltages are configurable via BSC to adapt to the phone's various operating states, enabling optimum efficiency over the entire load range with up to 93% during normal load. The core switcher supports open loop dynamic voltage scaling (DVS) through BSC, which further improves the system's efficiency. The switching regulators' operating frequency is 2 MHz, allowing the use of small-size, low-profile external components.

The BCM59035 consists of a third integrated switching regulator which boosts the battery voltage to generate the 5V/200 mA VBUS for USB On-The-Go (OTG), as well as the detection comparators required by the USB OTG 1.3 standard.

Fifteen LDOs are optimized for their specific functions to power all analog, RF, host controller, and peripheral circuitries. RF and Analog LDOs typically achieve excellent power supply rejection and low noise performance. Power-up sequencing of the LDOs is programmable via OTP bits.

The battery management section includes a linear battery charger with Wall/USB charging functions, automatic charger source switchover, battery presence detection, battery temperature monitoring, and die temperature regulation loop. In addition, the battery management section supports a coulomb counter-based fuel gauge and a backup battery charger. Precise charging accuracy and temperature monitoring loop ensure maximum battery life and safety. The main battery charger supports precharge, constant current, and constant voltage charging modes for maximum reliability. The backup battery charger also supports Constant Current (CC) and Constant Voltage (CV) charging modes.

An RTC module provides 32.768-kHz output, time reference, and alarm functions with wake-up control. Two programmable current sources generate output patterns with programmable duty cycle and frequency. Two general-purpose I/O (GPIO) ports can be programmed or read by the host controller through the BSC interface and can be used to interface with external circuits.

Note: The Broadcom Serial Control (BSC) bus is Philips® I²C-compatible.

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59035-PB00-R 12/19/07

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