AS3603

Fact Sheet

Multi-Standard Power Management Unit

1 General Description

The AS3603 is a highly-integrated, ultra-flexible CMOS power management device designed specifically for portable devices such as any standard of mobile phones, PDAs, CD players, digital cameras and other devices powered by 1-cell lithium-based or 3- 4-cell nickel-based batteries.

The device incorporates low dropout regulators (LDOs), DC/DC converters, a complete battery charger, and an audio power amplifier onto one die.

The linear analog LDOs feature extremely high performance regarding:

- Noise – typ 30µV$_{RMS}$ from 100Hz to 100kHz
- Line/Load Regulation – < 1mV static and < 10mV transient
- Power Supply Rejection – > 70dB @ 1kHz

The integrated Step Down DC/DC Converter does not require an external Schottky diode yet provides very high efficiency (up to 95%) throughout the whole operating range. It can be either used as a stand-alone device or as a pre-regulator for LDOs to increase overall device efficiency.

A Step Up DC/DC Converter is included to supply power for white LEDs together with programmable current sources to control LED brightness.

A low-distortion audio power amplifier (1 Watt @ 8Ω) supports handsfree mobile phone operation and HiFi ringtones.

The device also features a chemistry-independent battery charger including fuel gauge circuitry, automatic trickle charging, programmable constant current, constant voltage and pulse charging.

The AS3603 is controlled via a serial interface and integrates all necessary system specific functions such as Reset, Watchdog, and Power-On Detection.

Regulator output voltages are programmable by software. Eight preset startup timings can be selected by an external resistor.

This data sheet is applicable for device versions:

- AS3603-FxC
- AS3603-GxC

2 Key Features

- Ten Programmable High Performance LDOs
  - 2 Digital Low Power LDOs (0.75-2.5V, 200mA)
  - 3 RF Low Noise LDOs (1.85 - 3.4V, 150mA)
  - 2 RF Low Noise LDOs (1.85 - 3.4V, 75mA)
  - 1 SIM Low Power LDO (3.0V, 20mA)
  - 1 Periphery Low Noise LDO (2.5 - 3.2V, 150mA)
  - 1 Low Power LDO (2.5V, 10mA)
- Programmable High Efficiency DC/DC Converters
  - Step Down: 1.0 - 3.0V, up to 500mA
  - Step Up: 15V, 45mA, (for White LEDs)
- Stereo Audio Power Amplifier
  - 0.5W @ 4Ω -stereo
  - 1W @ 8Ω -bridged
  - Digital Volume Control, 3dB Steps
  - Click- and Pop-Less Start-Up and Power-Down
- Complete Chemistry-Independent Battery Charger
  - Integrated Fuel Gauge
  - Automatic Trickle Charging
  - Programmable Constant Current Charging
  - Programmable Constant Voltage Charging
  - Programmable Pulse Charging
  - Safety Functions (Low Battery Shutdown)
  - Operation without Battery
  - No-Battery detection
- Four 8-Bit Programmable Current Sources (0.625mA - 160mA) support:
  - Buzzer
  - Vibrator
  - LEDs
- Wide Battery Supply Range 3.0V - 5.5V
- Four General Purpose Switches (1Ω and 2Ω)
- Four Programmable General Purpose I/O Pins
- On-Chip Bandgap Tuning for High Accuracy (+/-1%)
- Integrated Programmable Watchdog (7.5 - 1900ms)
- Programmable Reset (10 - 110ms)
- Shutdown Current typ 7µA (2.5V Always On)
- Overcurrent and Thermal Protection
- 0.35µ CMOS Solution
- 48-pin, 6x6mm QFN Package (0.4mm pitch)
- 48-pin, 7x7mm QFN Package (0.5mm pitch)
- 2.1 Watt Power Dissipation @ T$_{AMBIENT}$ = 70ºC

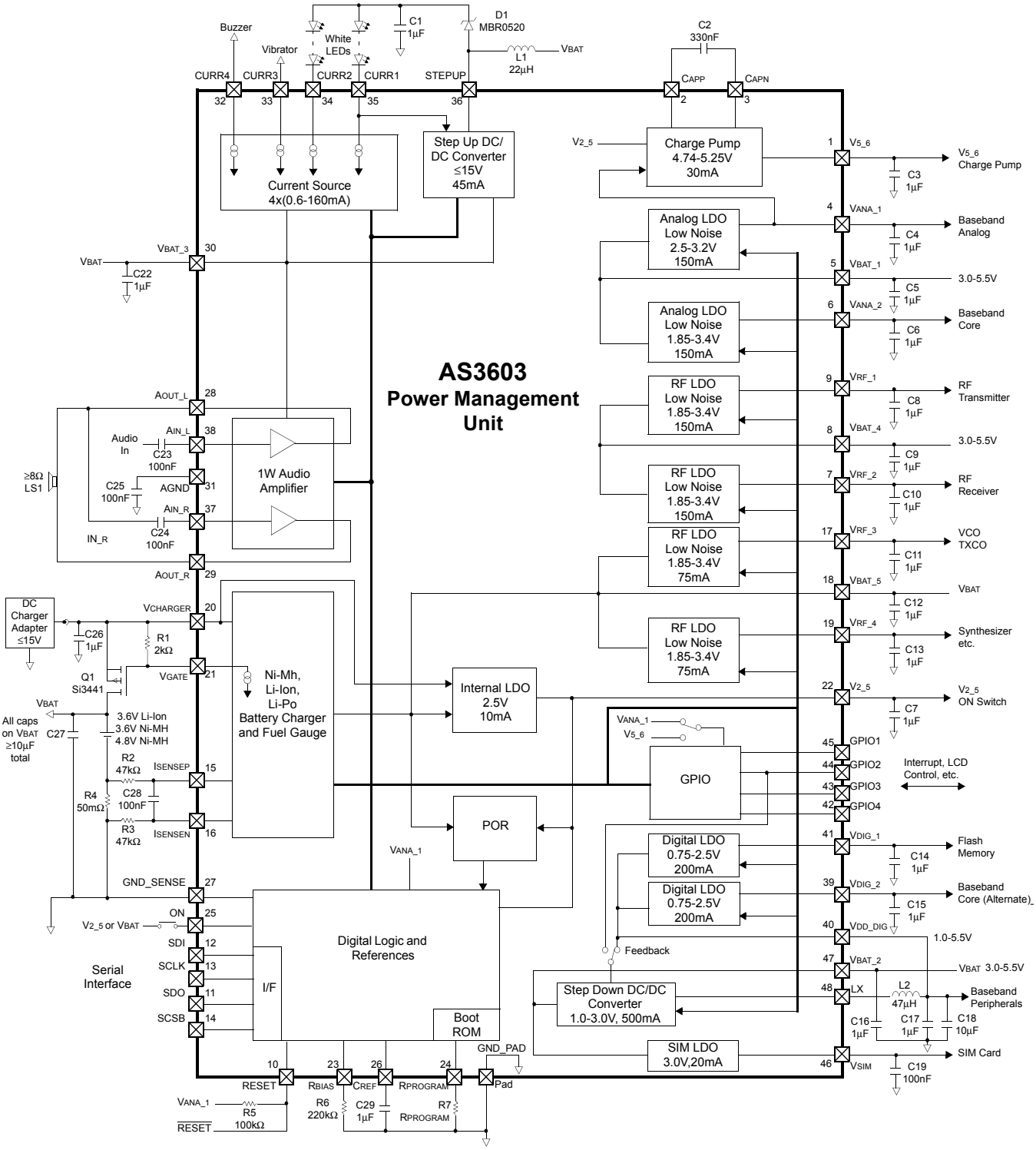
3 Application

Multi-standard power management for mobile phones, PDAs, and 1-cell Li+ or 3 to 4-cell Ni-Mh powered devices.

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4 Block Diagram

Figure 1. AS3603 Block Diagram. Option: Audio Amplifier In Differential Mode, Step Down DC/DC Converter as Pre-regulator for Digital LDOs



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