Multi-Standard Power Management Unit for Cellular Phones / PDAs and other Battery Powered Mobile Devices

AS3601 Data Sheet (preliminary confidential)

General Description

The AS3601 is a highly integrated CMOS Power Management Unit to supply multi-standard battery powered handsets such as CDMA, WCDMA, GSM, GPRS, EDGE, UMTS and Japanese Standards.

The device incorporates low dropout regulators, DC/DC converters, a complete charger and an audio power amplifier on one die. It is assembled into a 48-pin Micro Lead Frame Package (MLF-QFN) with enhanced thermal characteristics and small form factor.

The linear analog regulators feature extremely high analog performance regarding noise (30µVrms typ. from 100Hz to 100kHz), line/load regulation (<1mV static and <20mV transient) and power supply rejection (>70dB@1kHz).

The integrated step-down DC/DC converter does not require an external schottky diode and provides a 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 the overall efficiency.

To supply white LEDs an additional step-up DC/DC converter is included together with programmable current sources to control the brightness.

A low distortion audio power amplifier (1 Watt differential) allows hands-free operation and high quality ringing tones.

The device also features a chemistry independent charger including automatic trickle charge, gas gauge and programmable constant voltage and current charging.

The AS3601 is controlled via a serial interface and integrates all necessary system specific functions such as Reset, Watch Dog and On Detection.

Output voltages and start-up timings can be programmed either on metal-mask level, by register or by an external resistor.

Key Features

10 Programmable High Performance Regulators
- 2 Digital Low Power LDOs (0.75-2.5V, 200mA)
- 4 RF Low Noise LDOs (2.0-3.0V, 150mA)
- 1 SIM Low Power LDO (1.8-3.0V, 20mA)
- 1 BB Low Noise LDO (2.0-3.0V, 150mA)
- 1 Periphery Low Noise LDO (2.5-2.8V, 150mA)
- 1 Low Power LDO (2.5V, 20mA)

Programmable Highly Efficient DC/DC Converters
- Step-down: 1.0-3.0V, 250mA
- Step-up: 15V, 40mA e.g. for white LEDs

Stereo Audio Power Amplifier
- Max. 0.5W@4Ohm
- Digital Volume Control, 3dB steps
- Click- and Pop-less start-up and power-down

Complete Chemistry Independent Charger
- Integrated Gas Gauge
- Automatic Trickle Charge
- Prog. Constant Current Charging (0.1-1A)
- Prog. Constant Voltage Pulse Charging
- Safety Functions (Low Battery Shutdown)
- Over and Under Temperature Charge Disable

4 Programmable Current Sources
- Buzzer (64-127mA)
- Vibrator (64-127mA)
- LED1 (1-64mA)
- LED2 (1-64mA)

- Wide Battery Supply Range 3.0V – 5.5V
- Serial Control Control Interface
- On Detect with Hardware Regulator Program
- 2 General Purpose Switches (2Ohm)
- 4 Programmable General Purpose I/Os
- On-Chip Bandgap Tuning for High Accuracy (+/-1%)
- Integrated Programmable Watchdog (1-1000ms)
- Programmable Reset (10-500ms)
- Shutdown Current <1uA
- Overcurrent and Thermal Protection
- 0.35u CMOS Solution
- 48 Pin Micro Lead Frame Package (MLF-QFN)
- 2.2 Watt Power Disipation @ TAmbient =70C

Application

- Multi-Standard Power Management for Cellular Phones
  PDAs
- 1 Cell Li+ or 3 Cell NiMH powered devices