

# AS3654

## Power Management Unit with 18 Bit Audio DAC + Headphone Amplifier, DCDC Charger, 3 Buck DCDCs, 3 Boost DCDCs, 5 LDOs, Current Sinks, ADC

### 1 General Description

The AS3654 is a highly integrated solution for power supply generation and monitoring, battery management including charging. It is controlled via a serial control interface and integrates all necessary system specific functions such as clock, reset and interrupt generation, voltage and temperature monitoring.

### 2 Key Features

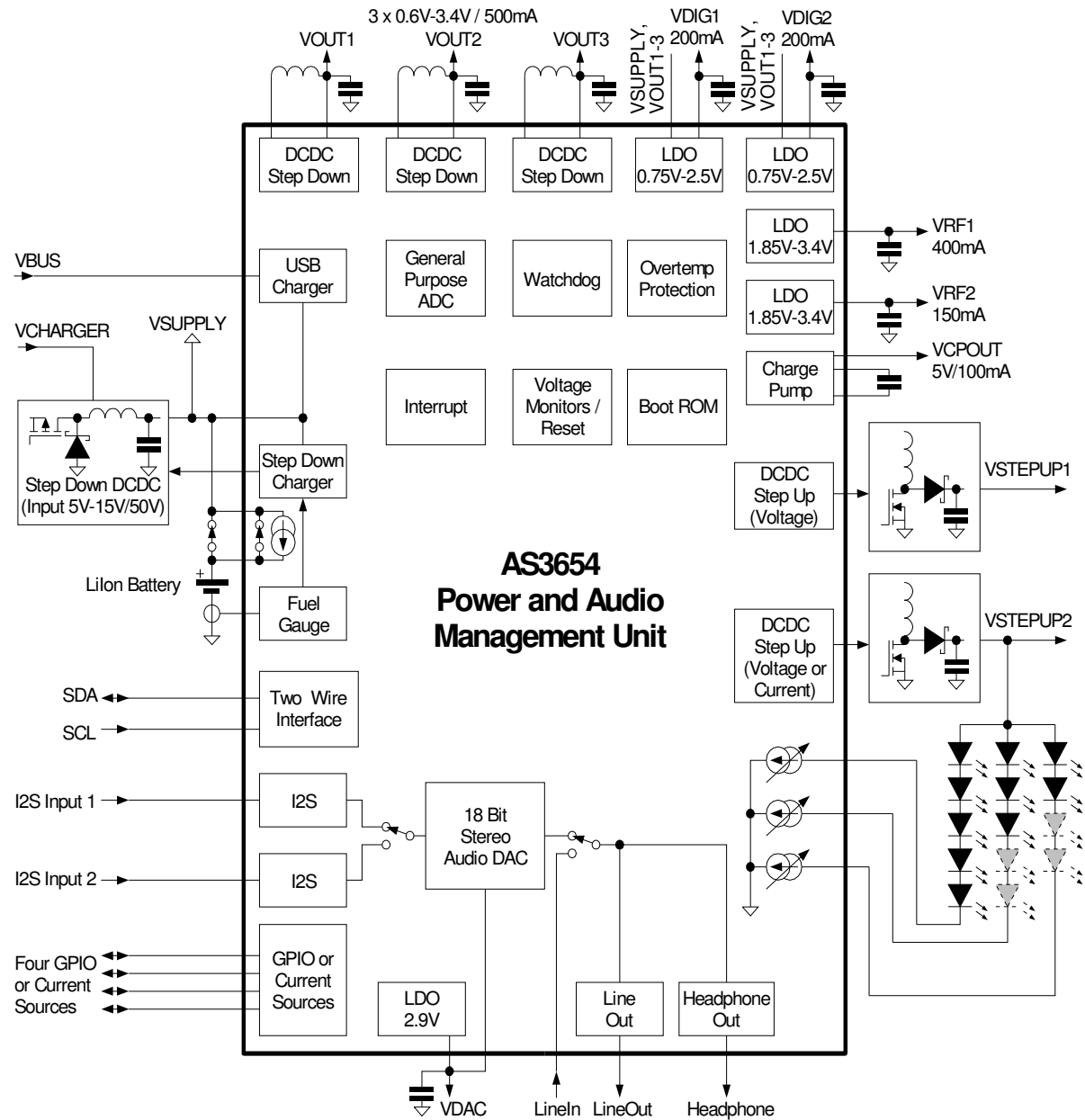
- System Control
  - Serial Control Interface
  - On/Off Control Module
  - Reset Generation for system controller
  - Programmable Interrupt Controller
  - Watchdog
  - Low power off mode (9 $\mu$ A; 2.5V LDO on)
- Supply Voltage Generation
  - 1 RF Programmable Low Noise LDOs (400mA)
  - 1 RF Programmable Low Noise LDOs (150mA) 2 RF Programmable Low Noise LDOs (150mA)
  - 2 Programmable Digital Low Power LDOs (200mA)
  - 2 General Purpose PWM DC/DC step up converter with two programmable current sinks (e.g. for white led)
  - 3 General Purpose high efficiency DC/DC step down converter
  - 1 Low noise charge pump with 5V output voltage
  - 1 Ultra Low Power 2.5V LDO (always on)
- Current sinks
  - 4 programmable(6-bit) from 0.625 to 40mA optional useable as GPIOs
  - 3 programmable high voltage (15V) (6-bit) from 0.625 to 40mA
  - internal PWM generator
- 10-bit Successive Approximation ADC
  - 40 $\mu$ s conversation time
- Battery Management
  - Full featured chemistry independent step down charger with included Gas Gauge and Current limitation
  - 0.2  $\Omega$  Battery switch for start-up during trickle charging
  - Integrated USB charger up to 400mA
- Power Management Features
  - Wide Battery Supply Range 3.0...5.5V
  - On-Chip Bandgap Tuning for High Accuracy ( $\pm$ 1%)
  - Current protection
  - Thermal Protection with internal temperature sensor
- Audio
  - 18 Bit Audio DAC
  - Two Digital Audio Inputs (I2S interface)
  - 2.9V low Noise LDO for Audio DAC
  - Headphone Amplifier Output with GND separation
  - GND Buffer for Headphone Amplifier
  - Line/ Headphone output with GND separation
- Programmable System clock
  - 1.6 MHz to 2.3 MHz with 100 kHz steps
- Package
  - BGA100 9x9mm, 0.8mm pitch

### 3 Application

- Power Management Unit
- 1 Cell Li+ or 3 Cell NiMH powered devices
- Car battery powered systems with and without internal battery

## 4 Block Diagram

Figure 1 – AS3654 Block Diagram



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