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AS3710

Product Brief

High Current Power Management Unit for Portable Devices

1 General Description

The AS3710 is a compact System PMU with integrated battery charger and back light driver.

The device offers advanced power management functions. All necessary ICs and peripherals in a battery powered mobile device are supplied by the AS3710. It features 3 DCDC buck converters as well as 8 low noise LDOs. The different regulated supply voltages are programmable via the serial control interface. 4MHz operation with 1uH coils are reducing cost and PCB space.

The three step-up converter generate voltages for e.g.the backlight, classD amplifier, USB host support or LCD display supply. Both constant voltage (for e.g. OLED supply) as well as constant current (white LED backlight) operations with three current sinks are possible. An internal voltage protection is limiting the output voltage in the case of external component failures.

AS3710 contains a linear or switching mode Li-Ion battery charger with constant current and constant voltage. The maximum charging current is 1.5A. An integrated battery switch and an optional external switch are separating the battery during charging or whenever an external power supply is present. With this switch it is also possible to operate with no or deeply discharged batteries. A programmable current limit can be used to control the maximum current used from a USB supply. Additional features are a 30V OV protection and battery temperature supervision.

The single supply voltage may vary from 2.7V to 5.5V.

2 Key Features

Power Management

Voltage Generation

- 3 DCDC step down regulators
 - DVM (0.6V-3.3V; 1x 1.2-1.5A, 2x 0.7-1A)
 - 50uA quiescent current
 - selectable switching frequency (2, 3 or 4MHz)
 - 2A with combined DCDC 2 & 3
- 2 analog low noise LDOs, 6 digital LDOs
 - 2x 1.2-3-3V, 6x 0.9-3.3V; 150-300mA
 - 30uA quiescent current (low power mode)
- 1 ultra low power always on LDO 2.5V, 10mA
- power supply supervision
- 4sec and 8sec emergency shut-down
- stand-by function

HV Backlight Driver

- 3x step up with external transistor
- voltage control mode and over-voltage protection
- 3 programmable current sinks (max. 40mA)
- e.g. 500mA@5V; 40mA@50V
- possible external PWM dimming input (DLS, CABAC)

Battery Charger

- prog. trickle charging (25-220mA)
- prog. constant current charging (up to 1500mA)
- prog. constant voltage charging (3.9V-4.25V)
- charger time-out and temperature supervision
- selectable current limitation for USB mode
- integrated battery switch & ideal diode (linear mode)
- external battery switch control (switching mode)
- external 30V OV protection

General

Supervisor

- automatic battery monitoring with interrupt generation and selectable warning level
- automatic temperature monitoring with interrupt generation and selectable warning and shutdown levels

Real Time Clock

- ultra low power 32kHz oscillator
- sec and minute counter, auto wake-up
- selectable alarm (seconds or minutes)
- 32kHz clock output to peripheral
- <1uA total power consumption

4 General Purpose IOs

- 10bit general purpose ADC input
- wake-up/sleep and DVM input
- PWM (DLS, CABAC) dimming input
- status output for: charger, low battery, power good and step-up overcurrent
- Q32k clock output
- interrupt output
- PWM output
- step-up feedback input

OTP programmable BOOT Sequence

- programmable regulator default voltages
- programmable start-up sequence

General Purpose ADC

- 10bit resolution
- several internal / external sources
 - VUSB, VSUP, CHGIN, VBAT
 - GPIOx, CURRx
 - XOUT32K, SENSEN_SU1
 - chip temperature

Control Interface

- I2C control lines, including watchdog
- Power-Up input
- bidirectional reset, with selectable delay
- ultra low power standby mode

Power-On Reset Circuit

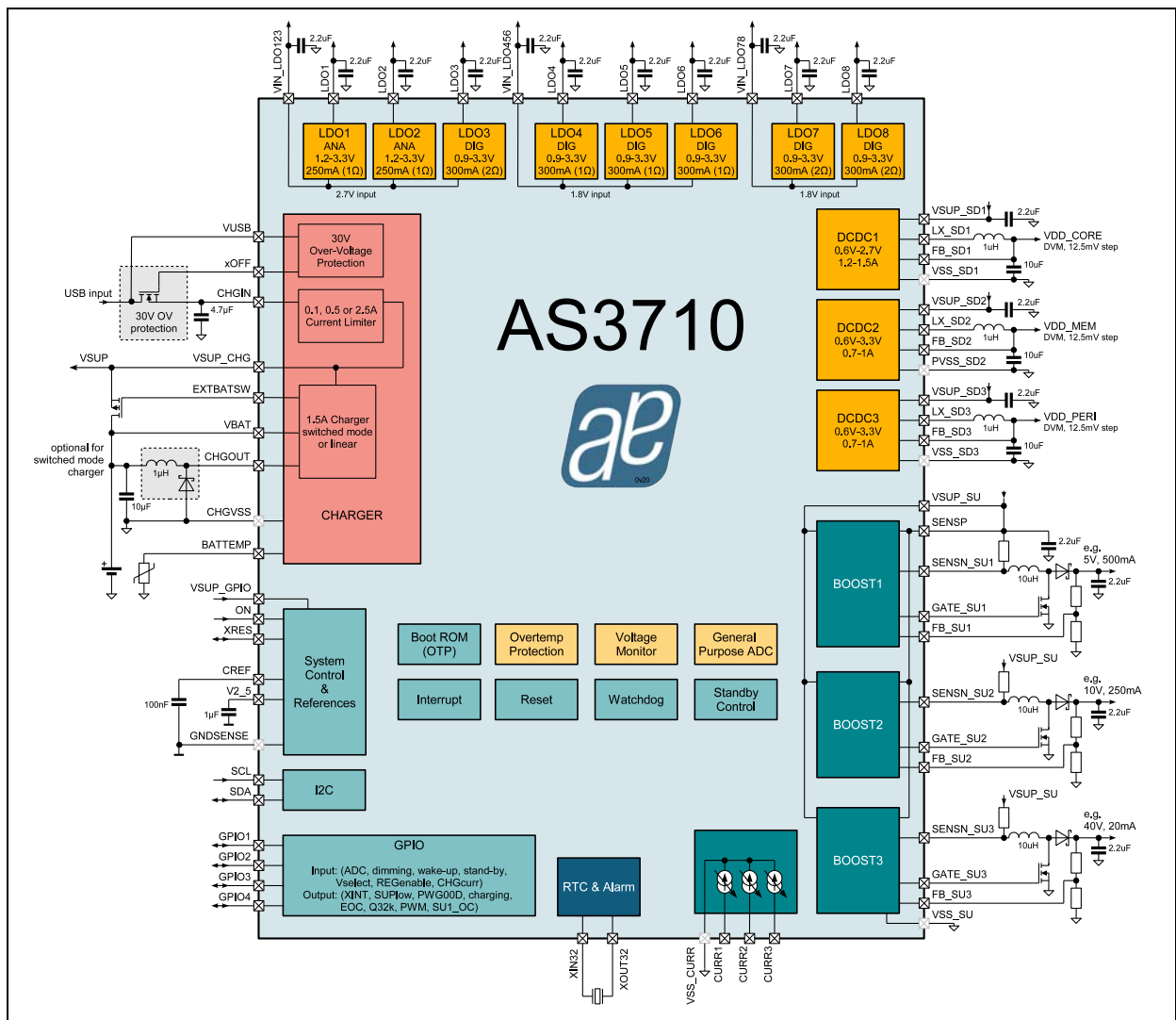
Packaging

QFN56 7x7mm 0.4mm pitch

Application

Portable Media Players, Portable Navigation Devices, E-Books, Mobile Internet Devices, Tablet PCs

Figure 1. AS3710 Block Diagram



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