X-Powers AXP818

High Integrated Power Management and Audio Codec Solution for Multi-Core High-Performance System

Revision 1.0

Overview

AXP818 is a high integrated power management and audio Codec integrated circuit available in 11mm x 11mm 218-ball BGA package. The device contains power management, USB3.0-compatible Flash Charger, audio codec, real-time clock(RTC).

The power portion of AXP818 targets at Li-battery(Li-ion or Li-polymer)applications that require multi-channel power conversion outputs. It provides an easy and flexible power management solution for multi-core processors to meet the increasingly complex and accurate requirements on power control.

The device comes with an adaptive USB3.0-compatible Flash Charger that supports up to 2.8A charge current. It also supports 21 channels power outputs (including 7-CH Bucks). To ensure the security and stability of the power system, the device provides multiple channels 12-bit ADC for voltage/current/temperature monitor and integrates protection circuits such as OVP,UVP,OTP and OCP. Moreover, the device features a unique E-Gauge™ system, making power gauge easy and exact.

A fast interface is included to dynamically adjust output voltage and set the work mode so that the battery life can be extended to the largest extent. Other features combined with an IPS™ (Intelligent Power Select) circuit to transparently select the type of charger and provide charging with USB chargers, external AC chargers, and Li-battery.

The audio codec of the device includes three I2S/PCM interfaces to provide independent and fully asynchronous connection to multiple processors, five analog input paths to allow diverse analog audio sources such as microphone, baseband voice, FM radio, etc , and five differential or single-ended output paths to be used in headphone amplifiers, speakers and baseband voice, etc. Meanwhile, the integrated hardware DSP engine capable of AGC and DRC , which can respectively be used in record and playback paths for maintaining a constant signal level and maximizing the loudness .

In addition, the device has a RTC , it can be powered by a backup battery when the main supply is not present.

AXP818 is extremely diverse on tablets ,smart phones and mobile application platforms.

Features

15 LDOs & Switch	• RTC_LDO: VCC_RTC=3V,IMAX=60mA,always enable • ALDO1: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps, IMAX=500mA, input is ALDOIN • ALDO2: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps, IMAX=300mA, input is ALDOIN • ALDO3: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps, IMAX=200mA, input is ALDOIN • DLDO1: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps; IMAX=500mA, input is DLDOIN • DLDO2: Analog LDO, 0.7-3.4V, 100mV/step; 28 steps; 3.4-4.2V, 200mV/step, 5 steps. IMAX=400mA, input is DLDOIN • DLDO3: Analog LDO, 0.7-3.3V, 100mV/step; 27 steps, IMAX=300mA, input is DLDOIN • DLDO4: Analog LDO, 0.7-3.3V, 100mV/step; 27 steps, IMAX=500mA, input is DLDOIN • ELDO1: Digital LDO, 0.7-1.9V, 50mV/step; 25 steps, IMAX=400mA, input is ELDOIN • ELDO2: Digital LDO, 0.7-1.9V, 50mV/step; 25 steps, IMAX=200mA, input is ELDOIN • ELDO3: Digital LDO, 0.7-1.9V, 50mV/step; 25 steps, IMAX=200mA, input is ELDOIN

Features (Continued)

	• FLDO1: Digital LDO, 0.7-1.45V, 50mV/step, 16 steps, IMAX=300mA, input is FLDOIN • FLDO2: Digital LDO, 0.7-1.45V, 50mV/step, 16 steps, IMAX=100mA, input is FLDOIN • FLDO3:Sink and Source LDO, FLDOIN/2, DCDC5/2, IMAX=30mA, input is FLDOIN, default on • GPIO0LDO: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps, IMAX=100mA, input is ALDOIN • GPIO1LDO: Analog LDO, 0.7-3.3V, 100mV/step, 27 steps, IMAX=150mA, input is ALDOIN • CHGLED: GND switch for motor or LED, IMAX=100mA
7 Frequency spread Bucks	• DCDC1：PFM/PWM, 1.6-3.4V, 100mV/step, 19 steps, IMAX=1.5A • DCDC2：PFM/PWM, 0.5-1.20V, 10mV/step, 1.22-1.30V, 20mV/step, 76 steps, IMAX=3A • DCDC3：PFM/PWM, 0.5-1.20V, 10mV/step, 1.22-1.30V, 20mV/step, 76 steps, IMAX=3A • DCDC4：PFM/PWM, 0.5-1.20V, 10mV/step, 1.22-1.30V, 20mV/step, 76 steps, IMAX=3A • DCDC5：PFM/PWM, 0.8-1.12V, 10mV/step, 1.14-1.84V, 20mV/step, 70 steps, IMAX=2.5A, default set by DC5SET • DCDC6: PFM/PWM, 0.6-1.10V, 10mV/step, 1.12-1.52V, 20mV/step, 72 steps, IMAX=2.5A • DCDC7: PFM/PWM, 0.6-1.10V, 10mV/step, 1.12-1.52V, 20mV/step, 72 steps, IMAX=1.5A • DCDC2/3/4/5/6/7: DVM • DVM(Dynamic Voltage scaling Management) ramp rate:2.5Mv/us at buck frequency 3MHz
Power Management	• TWI/RSB control interface supporting standard and quick slave mode • Intelligent Power Select (IPS), VBUS-IPSOUT is 110mΩ typically • Adaptive Li battery PWM charger with current total up to 2.8A • Battery Fuel Gauge and coulomb counter • Power output on/off touch key • Internal Temperature sensor and protection • Safe and Soft start up
Audio	• 2 ADCs and 2 DACs @ 24-bit and inter PLL processing with flexible clocking scheme • Up to 100dB SNR during DAC playback path (A ' weight) • Up to 95dB SNR during ADC record path (A ' weight) • Capless stereo headphone driver • Mono differential earpiece driver • Two stereo differential speaker outputs using external amplifier to drive the loud speaker • Differential Line output with 1 Vrms full scale output voltage • Two low noise analog microphone bias • Audio jack insert/ button press detection • 24-bit 8KHz ~ 192KHz I2S/PCM interface • Support Dynamic Range Controller (DRC) adjusting the DAC playback output • Support Automatic Gain Control (AGC) adjusting the ADC recording output • SRC for synchronization between audio interface or digital audio data mixing • Soft mute circuit for pop noise suppression • Support digital microphone interface • RTC and Three clock output

Power Management Typical Application