

Smart Analog IC Provider dedicates to professionalism

X-Powers Product Manuals

X-Powers Technology

深圳芯智汇科技有限公司

深圳芯智汇科技有限公司一直致力于嵌入式系统的功耗精细化管理, 我们秉持持续创新, 坚持卓越, 乐于分享, 奉献社会的经营理念和专业, 高品质, 诚信的核心价值观, 为成为世界一流的模拟器件提供商而努力。

Company Profile

X-Powers, founded in March 2009, aligns remarkable R&D teams with long-term core-technology investment in analog devices, SoC and system applications. As a leading supplier of power chips and analog devices in China, X-Powers is engaged in high-performance analog IC design and related technical support services. At present, the main products include: Power Management Unit, Battery Management Unit, Audio Codec, etc.

X-Powers has launched several generations of PMIC products and became a strategic partner of Intel since 2014. In 2015, the cumulative shipment volumes have reached 100 million. With the launch of ultra-high performance audio ADC AC108 in 2017, X-Powers has become a significant player in Intelligent Voice area, and dominated in smart speaker market share in China as ADC supplier. AC108 won the China IC Design Awards and World Electronics Achievement Awards in 2018.

X-Powers strives to be the industry-leading supplier of high-performance analog ICs and total solutions.



X-Powers Market Segment

Personal Electronic



Sport DV



360 Camera



VR



2 in 1 Notebook



Tablet



Voice Story Robot

Smart Home



Vacuum Robot



Smart Speaker



OTT Box



Battery IPC



Smart Photo Frame



TV

Automotive



Navigation Center



Smart Rear Mirror



CDR

Power Product Description

Part No	Family	Package	Features	
			Battery Management	Output
AXP15060	PMIC	QFN-6x6-52-EP	/	DCDCx6, LDOx16
AXP152	PMIC	QFN-5x5-40-EP	/	DCDCx4, LDOx7
AXP1530	PMIC	QFN-3x3-20-EP	/	DCDCx3, LDOx3
AXP173	PMIC	QFN-5x5-32-EP	IPS 1.4A linear charger E-gauge 1.0	DCDCx2, LDOx4
AXP192	PMIC	QFN-6x6-48-EP	IPS 1A linear charger Backup Battery E-gauge 1.0	DCDCx3, LDOx4
AXP202	PMIC	QFN-6x6-48-EP	IPS 1.5A PWM charger Backup Battery E-gauge 1.0	DCDCx2, LDOx5
AXP2101	PMIC	QFN-5x5-40-EP	Power Path Management 2A Charger E-gauge 3.0 Watchdog Power off current 20uA	DCDCx4, LDOx11
AXP216	PMIC	QFN-6x6-48-EP	IPS 2A PWM Charger E-gauge 2.0	DCDCx5, LDOx6
AXP228	PMIC	QFN-8x8-68-EP	IPS 2A PWM Charger E-gauge 1.0	DCDCx5, LDOx14
AXP288C	PMIC	QFN-9x9-76-EP	IPS 2.8A PWM Charger E-gauge 2.0 BC 1.2	DCDCx6, LDOx15

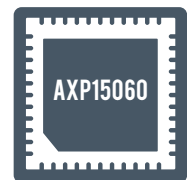
Power Product Description

Part No	Family	Package	Features	
			Battery Management	Output
AXP2401	BMU	QFN-5x5-40-EP	6~24V NVDC charger for 2 cells. Intel APL&GML platform E-gauge 2.0	/
AXP2402	BMU	QFN-5x5-40-EP	6~24V NVDC charger for 2 cells. E-gauge 2.0	/
AXP2403	BMU	QFN-4x4-32-EP	6-24V NVDC charger for 2-4S Battery	/
AXP2585 AXP2586	BMU	QFN-5x5-32-EP	Power Path Management 3A PWM Charger E-gauge 2.0 OTG CC Logic	/
AXP2601	E-gauge	DFN-2x3-8-EP	E-gauge 3.0 only 1~4 cells Normal current 11uA Sleep current 1uA	/
AXP8179	Discrete	QFN-2x3-12-EP	/	5.5~18V input 5.1V output@ 7A
AXP8180	Discrete	QFN-2x3-12-EP	/	4.5~18V input 3.3V output @7A

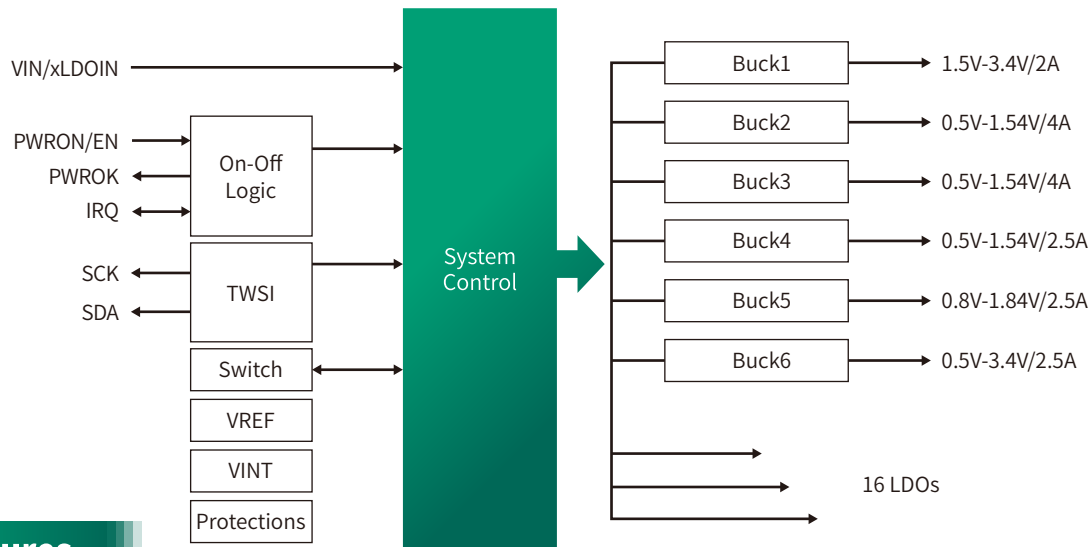
Audio Codec Product Description

Family	Part No	Channel	Package	SNR(dB)	THD+N (dB)	Special Function	Supply Voltage (V)	Applications
ADC	AC108	4-ch ADC	6x6 QFN48	108	-95		3.3 to 5	Smart Speaker/Smart TV/OTT Box/Robot
	AC107	2-ch ADC	3x3 QFN20	103	-85		1.8 & 3.3	
	AC107s	2-ch ADC	4x4 QFN24	103	-85		1.8 & 3.3	
Codec	AC101	2-ch DAC 2-ch ADC	5x5 QFN40	DAC 100 ADC 95	DAC-85 ADC-85	DRC/AGC	1.8 & 3.3	Table/Recorder
	AC102	1-ch DAC 1-ch ADC	3x3 QFN20	DAC 105 ADC 101	DAC-88 ADC-82	DRC/AGC/ 3EQ	1.8 or 3.3	Voice Story Robot/IPC/SDV

Product Overview



Block Diagram



Features

• 6 DCDCs

- DCDC1: 1.5~3.4V, IMAX=2A
- DCDC2~3: 0.5~1.54V, IMAX=4A, DVM
- DCDC4~6: 0.5~1.54V, DVM; 0.8~1.84V, DVM; 0.5~3.4V; IMAX=2.5A
- DCDC2 & DCDC3 can be set to dual-phase; DCDC4 & DCDC6 can be set to dual-phase
- DVM(Dynamic Voltage Management) ramp rate: 15.625us/step or 31.250us/step

• 16 LDOs, 1 Switch

- RTCLDO: 1.8V/3.3V, IMAX=100mA
- ALDO1~5: 0.7~3.3V, IMAX=600mA/300mA/200mA/300mA/300mA
- BLDO1~5: 0.7~3.3V, IMAX=300mA/500mA/300mA/400mA/600mA
- CLDO1~3: 0.7~3.3V, IMAX=200mA/200mA/300mA
- CLDO4: 0.7~4.2V, IMAX=200mA
- LDO:VDDR/2(source/sink), 0.7~1.4V, IMAX=200mA, input is DCDC5
- Switch: 0.1ohm switch, input is DCDC1, IMAX=1A, soft turn on
- TWISI(Two Wire Serial Interface) supporting standard mode (100KHz) and fast mode (400KHz), slave address is 0x36 or 0x37(7 bits) by customer
- RSB(Reduced Serial Bus) supporting for Allwinner platform, slave address is 0x03A2 or 0x04E6 by customer
- Internal temperature sensor and protection
- Monitor DCDCs output voltage, send interrupt and over/under voltage protection
- Customization for startup sequence and default voltage

Footprint

QFN 6x6mm² 52-pin

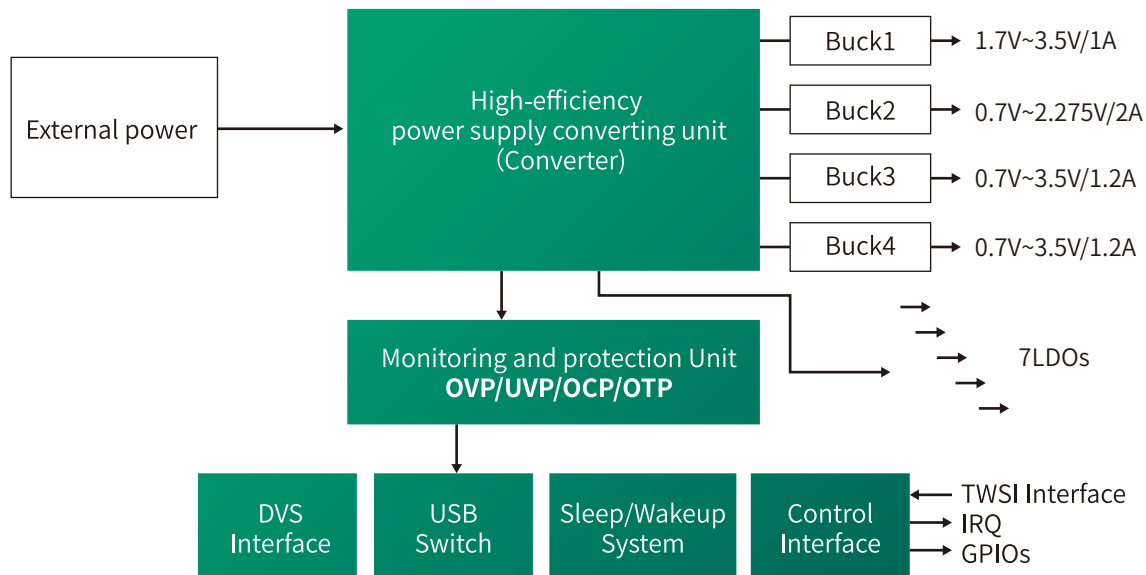
Applications

- VR, Tablet, Smartphone, Smart TV
- UMPC-like, Student Computer

Product Overview



Block Diagram



Features

- **Four step-down DC-DC(1000mA/2000mA/1200mA/1200mA)**
 - Buck1: 1.7-3.5V/1000mA
 - Buck2: 0.7-2.275V/2000mA, support DVM
 - Buck3/4: 0.7-3.5V/1200mA
- **Seven low-noise LDO**
 - RTC31、RTC13: 30mA
 - Digital LDO: 2 × 300mA, 0.7-3.5V/300mA
 - LDO0: Adjustable output voltage, max load current 1.5A, internal current limit 500/900/1500mA
 - Analog LDO: 2 × 300mA, 1.2-3.3V/300mA
 - GPIO LDO: 1.8-3.3V/20mA
- **System management**
 - Software and hardware Power key or switch function
 - Supports external wake-up
 - Output PWROK for system reset or turned off
 - OVP/UVP/OCP/OTP
- **Host Interface**
 - Support TWSI (Two wire serial interface)
 - Interrupt function with programmable masking
 - Multiple GPIO can be set respectively for IO, ADC, etc
 - Power-up timing

Footprint

QFN 5x5mm² 40-pin

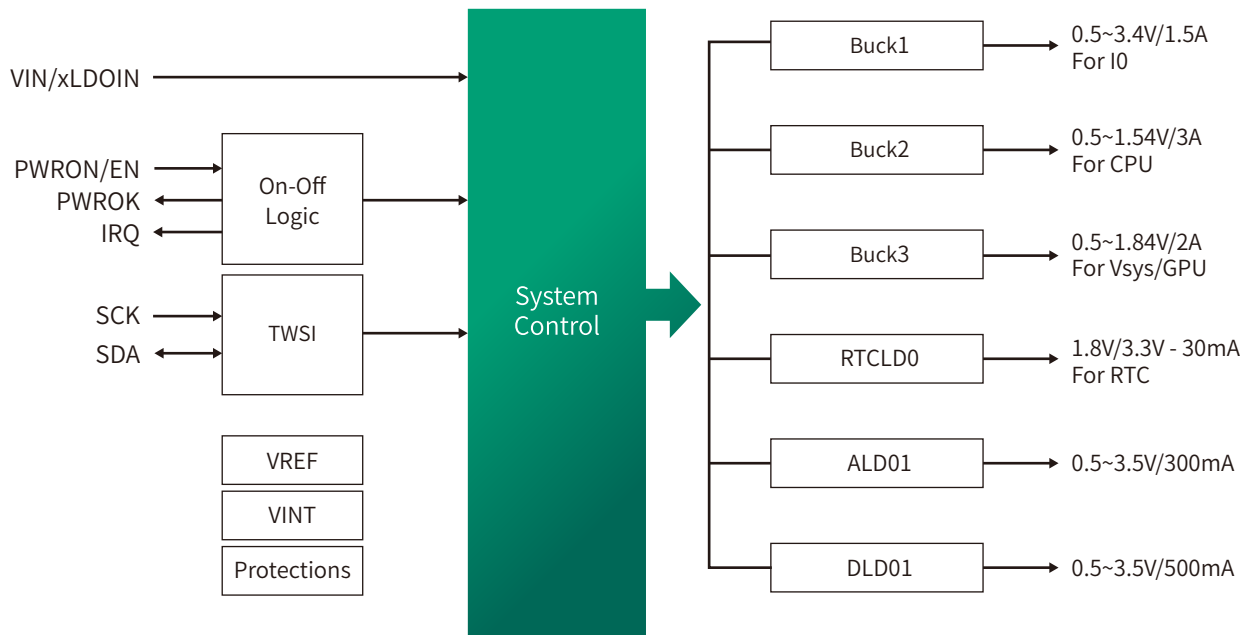
Applications

- Mobile Internet Device, xPad
- Digital Photo Frame, Portable DVD Player, Set-top Box Entertaining and Education Machine
- Network devices
- Safety monitor
- Application Processor Systems

Product Overview



Block Diagram



Features

- **3 DCDCs**
 - DCDC1: 0.5~1.2V, 10mV/step, 1.22~1.54V, 20mV/step, 1.6~3.4V, 0.1V/step, IMAX=1.5A, ILimit=2.5A;
 - DCDC2: 0.5~1.2V, 10mV/step, 1.22~1.54V, 20mV/step, IMAX=3A, ILimit=4A; support DVM;
 - DCDC3: 0.5~1.12V, 10mV/step, 1.14~1.84V, 20mV/step, IMAX=2A, ILimit=3A, for DDR;
- **3 LDOs**
 - RTCLDO: 1.8/3.3V, IMAX=30mA. Always on configured by customization, default OFF;
 - ALD01: low noise/high PSRR LDO, 0.5~3.5V, 0.1V/step, IMAX=300mA, Ipeak= 500mA;
 - DLD01: low power LDO, 0.5~3.5V, 0.1V/step, IMAX=500mA, Ipeak = 1000mA;
- **Internal temperature sensor and protection**
- **Monitor DCDCs output current, send interrupt and under/over voltage protection**
- **TWSI**
- **OTP for startup sequence and default voltage**

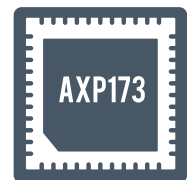
Footprint

QFN 3x3mm² 20-pin

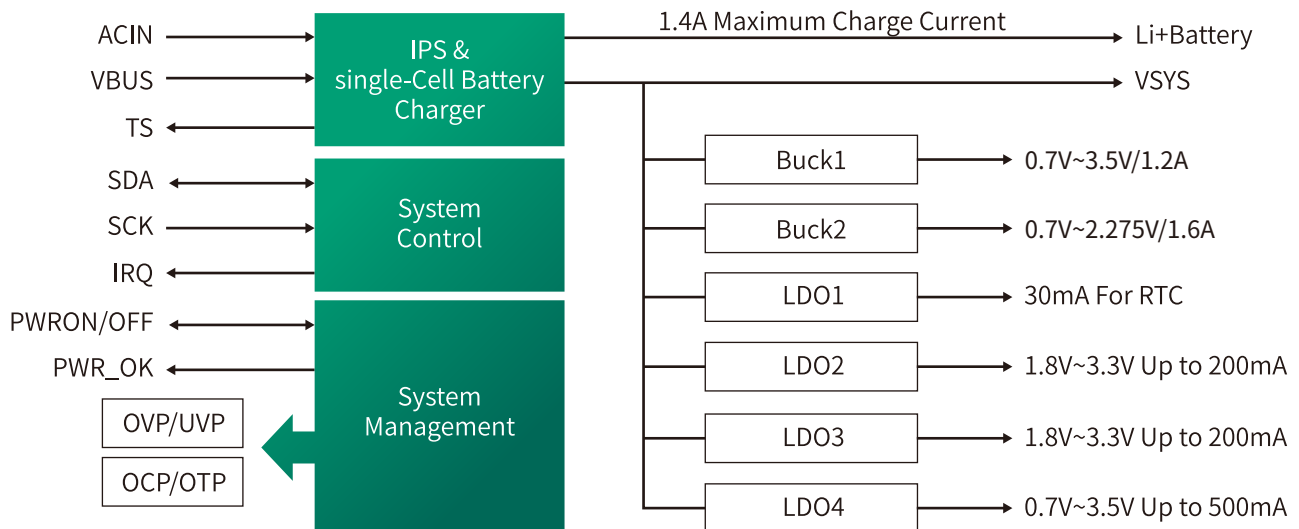
Applications

- OTT Box
- IPC

Product Overview



Block Diagram



Features

- **Intelligent Power Select (IPS™) for power system channel management**
- **Adaptive USB-compatible charger (MAX1.4A)**
- **Two step-down DC-DC (1200mA/1600mA), Four low-noise LDO (30mA/200mA/200mA/500mA)**
- **System management**
 - Software/hardware Power key or switch function
 - PWROK signal for system reset
 - OVP/UVP/OCP/OTP
 - Supports external wakeup
 - Output voltage monitor and self-diagnosis function
 - Supports USB-OTG power application
- **Information acquisition system**
 - Multi-channel 12-bit ADC
 - High-precision Coulomb Counter and Fuel gauge system to provide abundant power management information, including Instantaneous consumption(mA or mW), remaining battery life (% or mAh), charging status(%)
 - Chip temperature monitor
 - Low-power interrupt warning and protection
- **Host Interface**
 - Support TWSI (Two wire serial interface)
 - Interrupt function with programmable masking
 - Four registers for data buffer when Host-processor powers off
 - Power-up timing

Footprint

QFN 5x5mm² 32-pin

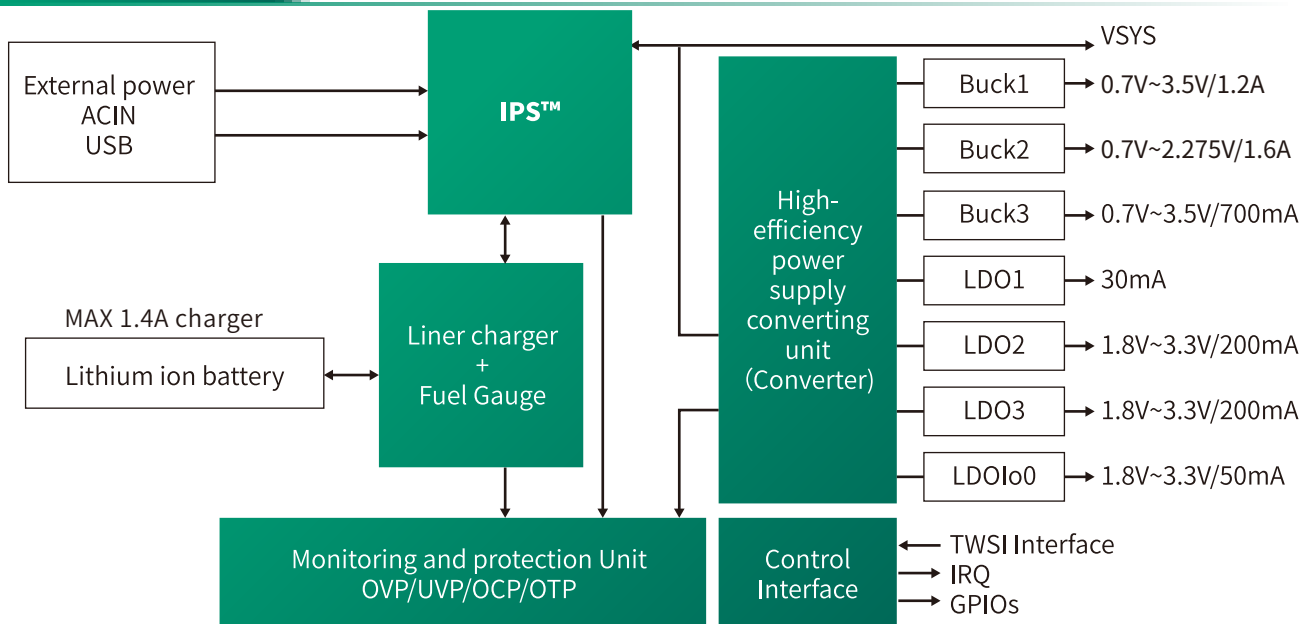
Applications

- Portable Handset
- Smartphone, PMP/MP4, Digital Camera, Digital Camcorder, PND, PDA, PTV
- MID, E-reader
- DPF, Portable DVD Player, Ultra Mobile UMPCand UMPC-like, Entertainment and Education Machine
- Application Processor systems

Product Overview



Block Diagram



Features

- **Intelligent Power Select (IPS™) for power system channel management**
- **Adaptive USB-compatible charger (MAX1.4A)**
- **Three step-down DC-DC (1200mA/1600mA/700mA), Four low-noise LDO (30mA/200mA/200mA/50mA)**
- **System management**
 - Software and hardware Power-Key or switch function, support external wake-up
 - Multimode dormancy control system
 - OVP/UVP/OCP/OTP
 - Output voltage monitor and self-diagnosis function
 - Support USB-OTG power application
- **Information acquisition system**
 - Multi-channel 12-bit ADC
 - High-precision Coulomb Counter and Fuel gauge system, providing abundant power management information including Instantaneous consumption(mA or mW), remaining battery life(% or mAh), charging status(%)
 - Chip temperature monitor
 - Low-power interrupt warning and protection
- **Host Interface**
 - Support TWSI (Two wire serial interface)
 - Interrupt function with programmable masking
 - Four registers for data buffer when Host-processor powers off
 - Power-up timing

Footprint

QFN 6x6mm² 48-pin

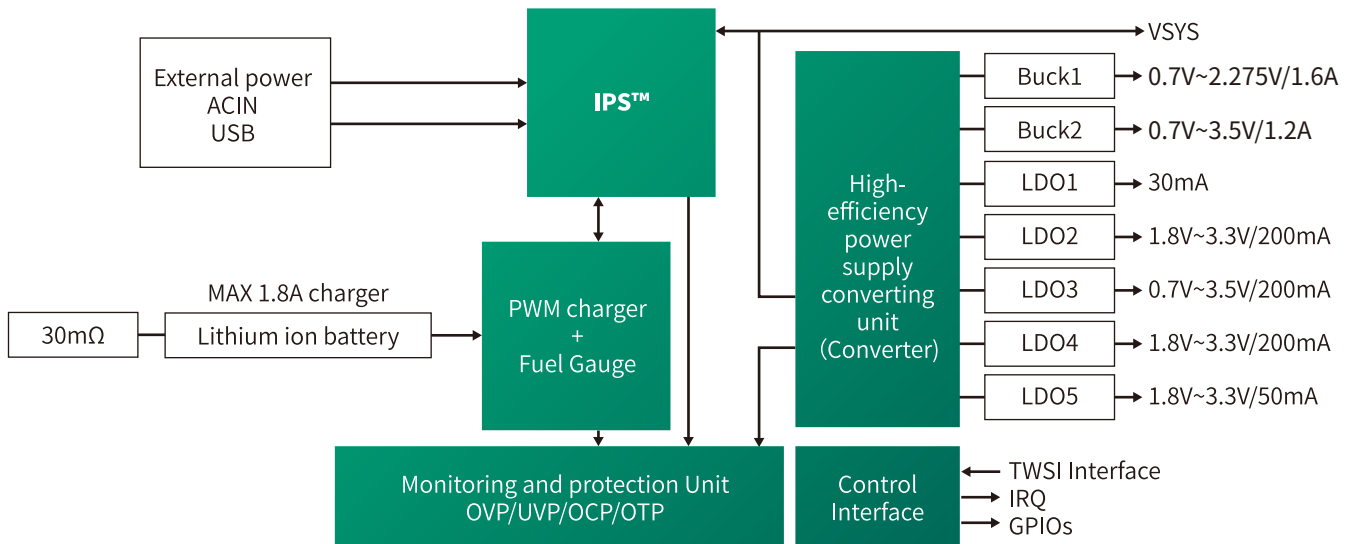
Applications

- Handhold mbile devices, Smart cell phone, PMP/MP4, digital camera, handheld navigation devices GPS, PDA, digital broadcast TV receiver
- MID(Mobile internet device)
- Digital photo Frame, portable DVDplayer, UMPC, and UMPC-like, Learning machine

Product Overview



Block Diagram



Features

- **Intelligent Power Select (IPSTM) for power system channel management**
- **Smart charger (Switching charging MAX1.8A)**
- **DVFS dynamic voltage regulation**
- **Multi-mode dormancy control system, reduce standby power consumption**
- **System management**
 - Software/hardware Power key or switch function
 - Supports external wake-up
 - OVP/UVP/OCP/OTP
 - Supports USB-OTG power application
- **Information acquisition system**
 - Multi-channel 12-bit ADC
 - High-precision Coulomb Counter and Fuel gauge system, providing abundant power management information including Instantaneous consumption(mA or mW), Remaining Battery Capacity(% or mAh), Charging Status(%)
 - Direct support for Android original ecological battery power measurement
 - Low-power interrupt warning and protection
 - Chip temperature monitor
- **Host Interface**
 - Support TWSI (Two wire serial interface)
 - Interrupt function with programmable masking
 - 12 registers for data buffer when Host-processor powers off
 - Power-up timing
 - Multiple GPIO can be set up respectively for IO, ADC, etc

Applications

- Handhold mobile devices, Smart cell phone, PMP/MP4, digital camera, handhold navigation devices GPS, PDA, digital broadcast TV receiver
- MID(Mobile internet device)
- Digital photo Frame, portable DVDplayer, UMPC, and UMPC-like, Learning machine
- Other battery and multi-power applications

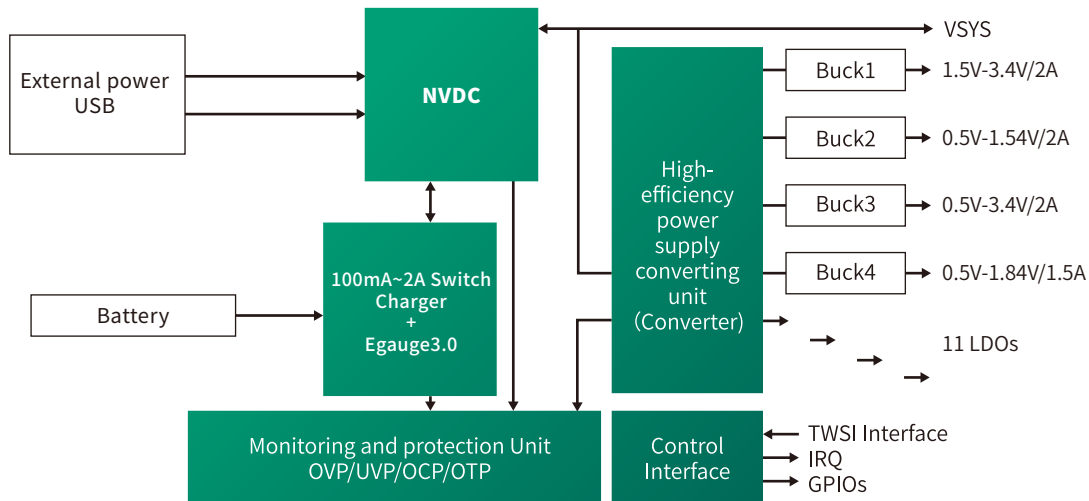
Footprint

QFN 6x6mm² 48-pin

Product Overview



Block Diagram



Features

- **3.9V-5.5V Input VBUS voltage Operating Range and Support single Cell Battery**
- **2.6V-4.4V Input VBAT voltage Operating Range**
- **High efficiency 100mA~2A buck mode Switch Charger, CV accuracy +/-0.5%**
- Single input to support USB supply
- **High integration including all MOSFETS, current sensing and loop compensation**
- **Power off current <20uA (BATFET off, RTCLDO output on, E-gauge works)**
- **NVDC for VBUS and VBAT**
- **4DCDCs**
 - DCDC1: 1.5~3.4V, IMAX=2A
 - DCDC2: 0.5~1.2V, 1.22~1.54V, IMAX=2A
 - DCDC3: 0.5~1.2V, 1.22~1.54V, 1.6~3.4V, IMAX=2A
 - DCDC4: 0.5~1.2V, 1.22~1.84V, IMAX=1.5A, for DDR
- **11 LDOs (ALDO1/BLDO1 accuracy<1%)**
 - RTCLDO1~2: 1.8V/2.5V/3V/3.3V, 30mA; Support RTCLDO1 supplied by backup battery(button battery)
 - ALDO1~4: analog LDO, 0.5~3.5V, 0.1V/step, IMAX=300mA
ALDO3 AND ALDO4 are low noise LDO
 - BLDO1~2: analog LDO, 0.5~3.5V, 0.1V/step, IMAX=300mA
high PSRR LDO
 - CPUSLDO: for CPUs, 0.5~1.4V, IMAX=30mA
 - DLDO1~2: analog LDO or power switch, 0.5~3.5V/ 0.5~1.4V, IMAX=300mA
- **OTP for startup sequence and default voltage of DCDC/LDO setting**
- **Internal temperature sensor**
- **Protection**
 - Input Over-Voltage Protection
 - Battery Thermistor Sense Hot/Cold Charge Suspend
 - Programmable Safety Timer for Charger
 - Die Thermal Balance for Charger
 - Thermal Shutdown
 - DCDC Over-Voltage/Under-Voltage Protection
 - LDO Short Protection
- **TWI/RSB for Control**
- **Watchdog Control**
- **Fuel Gauge: E-gauge 3.0**
- **Flexible GPIO setting**

Footprint

QFN 5x5mm² 40-pin

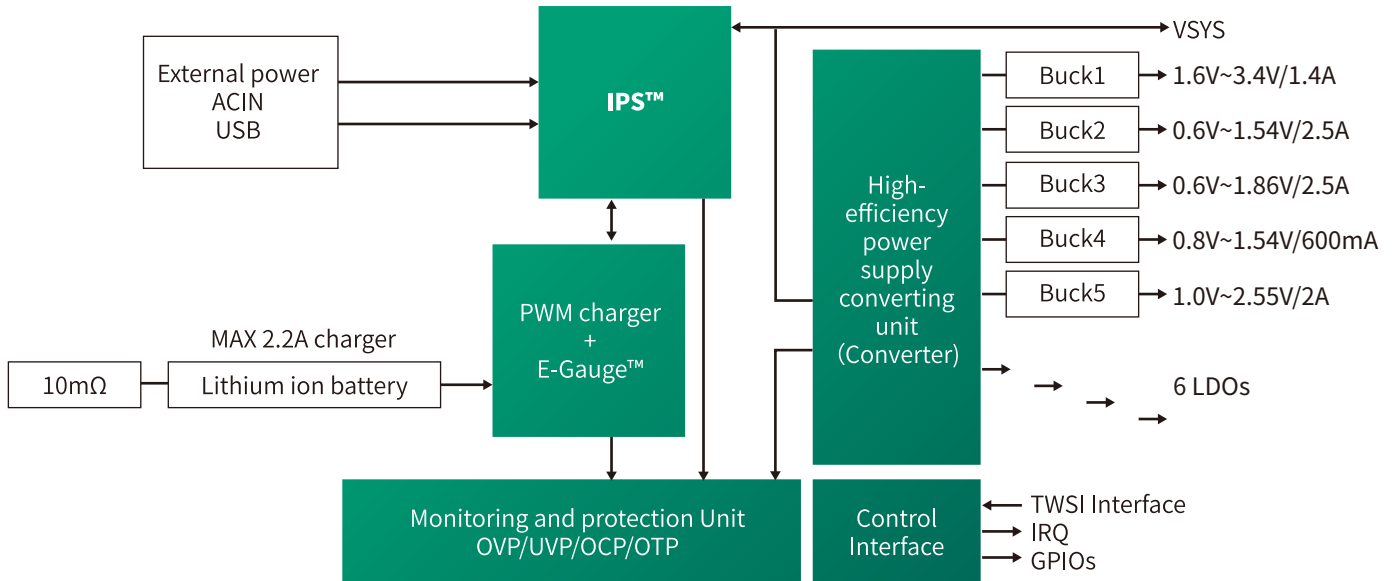
Applications

SDV, Car DVR, Battery IPC,
Smart Doorbell, Smart Speaker

Product Overview



Block Diagram



Features

- **Intelligent Power Select (IPS™) for power system channel management**
- **Smart charger (Switching charging MAX2.2A)**
- **DVFS dynamic voltage regulation**
- **Multi-mode dormancy control system, reduce standby power consumption**
- **System management**
 - Software and hardware Power key or switch function
 - Supports external wake-up
 - OVP/UVP/OCP/OTP
 - Supports USB-OTG power application
- **Information acquisition system**
 - Multi-channel 12-bit ADC, providing abundant power management information
 - Unique the E-Gauge coulomb meter system greatly simplifies the battery parameters test (full hardware, self-learning and high accuracy)
 - Low-power interrupt warning and protection
 - Chip temperature monitor
- **Host Interface**
 - Support TWSI (Two wire serial interface)
 - Interrupt function with programmable masking
 - 12 registers for data buffer when Host-processor powers off
 - Multiple GPIO can be set respectively for IO, ADC, etc
 - Power-up timing

Footprint

QFN 6x6mm² 48-pin

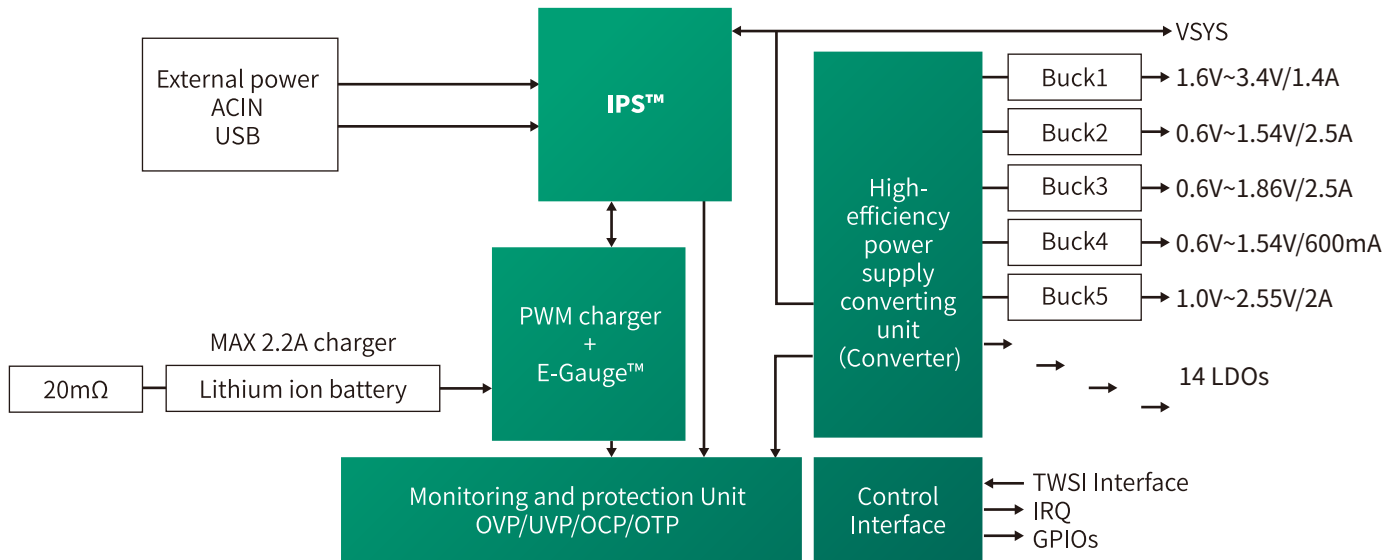
Applications

- Tablets, Smart Phones, Smart TVs, DVRs
- UMPC and UMPC-like, Student Computers

Product Overview



Block Diagram



Features

- **Intelligent Power Select (IPS™) for power system channel management**
- **Smart charger (Switching charging MAX2.2A)**
- **DVFS dynamic voltage regulation**
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 - Power-up timing

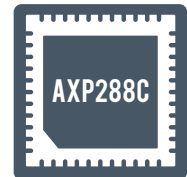
Footprint

QFN 8x8mm² 68-pin

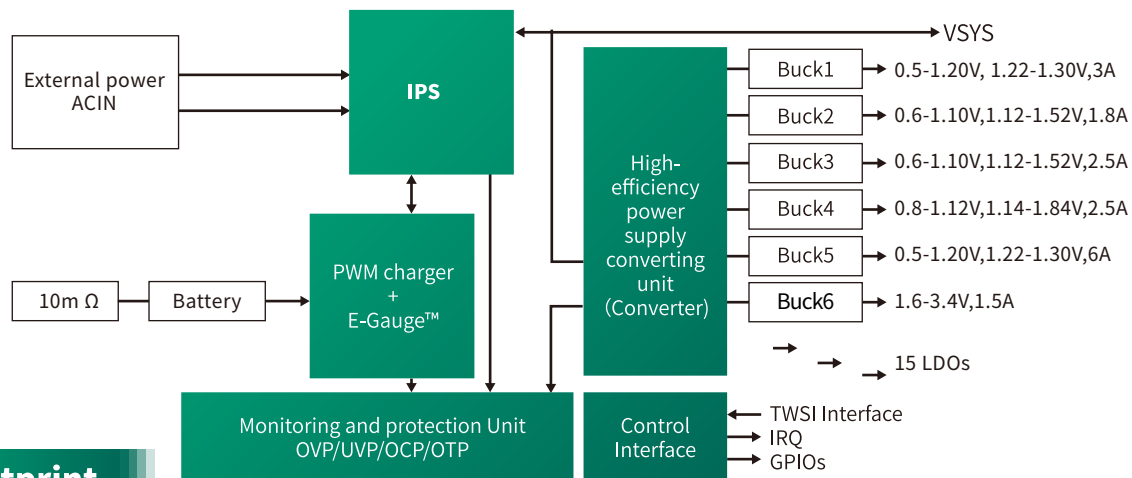
Applications

- Tablets, smartphones, smart TVs, DVRs
- UMPC and UMPC-like, student computers

Product Overview



Block Diagram



Footprint

AXP288C is customized PMIC for Intel Cherry trail (CHT-CR) platforms.

• 6 DCDCs

- DCDC1: 0.5-1.20V, 1.22-1.30V, IMAX=3A, DVM
- DCDC2~3: 0.6-1.10V, 1.12-1.52V, IMAX=1.8A/2.5A, DVM
- DCDC4: 0.8-1.12V, 1.14-1.84V, IMAX=2.5A, DVM, , default set by BUCK4SET
- DCDC5: 0.5-1.20V, 1.22-1.30V, IMAX=6A, DVM, Dual-Phase
- DCDC6: 1.6-3.4V, 19 steps, IMAX=1.5A

DVM ramp rate: 2.5mV/us at buck frequency 3MHz

• 15 LDOs & Switch+2GPIO

- RTCLDO: VCC_RTC=3V, IMAX=60mA, always enable
- ALDO1~3: Analog LDO, 0.7-3.3V, IMAX=500mA/300mA/200mA, input is ALDOIN
- DLDO1: Analog LDO, 0.7-3.3V, IMAX=500mA, input is DLDOIN
- DLDO2: Analog LDO, 0.7-3.4V, 3.4-4.2V, IMAX=400mA, input is DLDOIN
- DLDO3~4: Analog LDO, 0.7-3.3V, IMAX=300mA/500mA, input is DLDOIN
- ELDO1~3: Digital LDO, 0.7-1.9V, 50mV/step; 25 steps, IMAX=400mA/200mA/200mA, input is ELDOIN
- FLDO1~2: Digital LDO, 0.7-1.45V, 50mV/step, 16 steps, IMAX=300mA/100mA, input is FLDOIN
- FLDO3: Sink and Source LDO, FLDOIN/2, BUCK4/2, IMAX=30mA, input is FLDOIN, for VREFDQ, default on
- GPIO0LDO/GPIO1LDO: Analog LDO, 0.7-3.3V, IMAX=100mA/150mA, input is ALDOIN
- CHGLED: GND switch for motor or LED, IMAX=100mA

• Two wire serial interface (SCK/SDA) supporting standard and quick slave mode

• Intelligent Power Select (IPS), VBUS-IPSOOUT is 80mΩ 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

Footprint

QFN 9x9mm² 76-pin

Applications

- Tablet, DVR, Desktop, Dongle
- MPC-like, Student Computer

Product Overview



Features

- **6V-24V NVDC Charger Controller For Fixed 2 Cells Battery**

- Support Deeply Discharged Battery and No Battery Operation

- **Adapter Detection & Flexible Converter**

- Switching Frequency(600kHz-1.2MHz, step 200kHz)
- Ultra-Low Quiescent Current of 900µA and High PFM Light Load Efficiency 80% At 20mA Load to meet Energy Star and ErP Lot 6

- **Integrate E-Gauge™ 2.0**

- Chip T-sensor/Battery T-sensor/Mother board T-sensor*2
- Support TWSI Interface and Interrupt
- Support JEITA Guideline

- **Power On Key and Power On/Off Sequence For Discrete regulator and PMIC**

- **Support Intel APL/GLK Platform S0/S3/S4 State and LED Indication**

- Programmable Charge Voltage(8mV resolution), Charger Current(64mA resolution), Input Current(64mA resolution), Minimum System Voltage(256mV resolution)
- Battery Charging Cycle Times Information

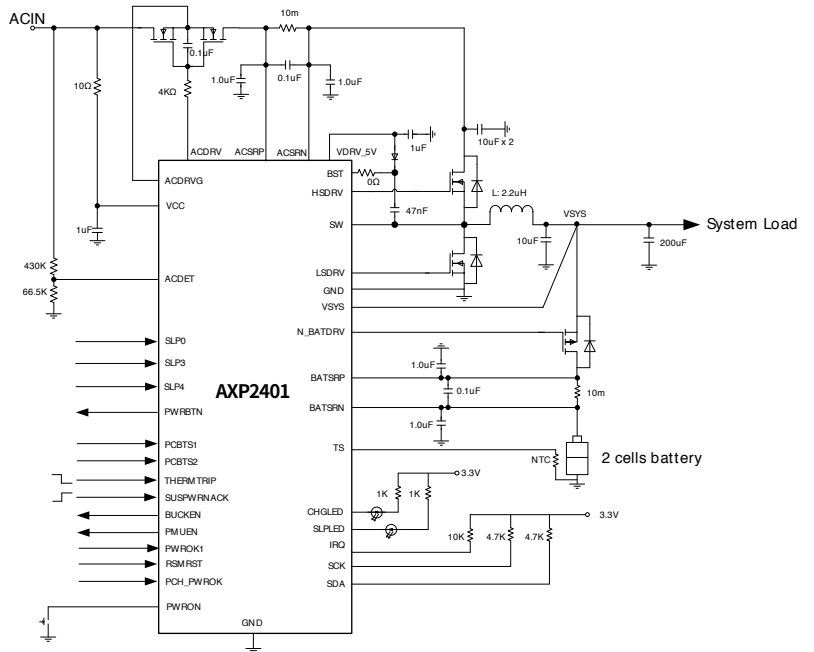
- **High Accuracy**

- ±0.5% Charge Voltage Regulation
- ±10%@2A Input/Charge Current Regulation
- 12-bit ADC for Monitoring Adapter&Charge Current&Battery Voltage

- **Protection**

- Adapter Under/Over-Voltage/Over-Current Protection
- Battery Over-Voltage Protection
- Battery Temp Sense From NTC Resistor
- System Over-Voltage Protection
- Charger Timeout Protection
- Thermal Shutdown Protection

Block Diagram



Footprint

QFN 5x5mm² 40-pin

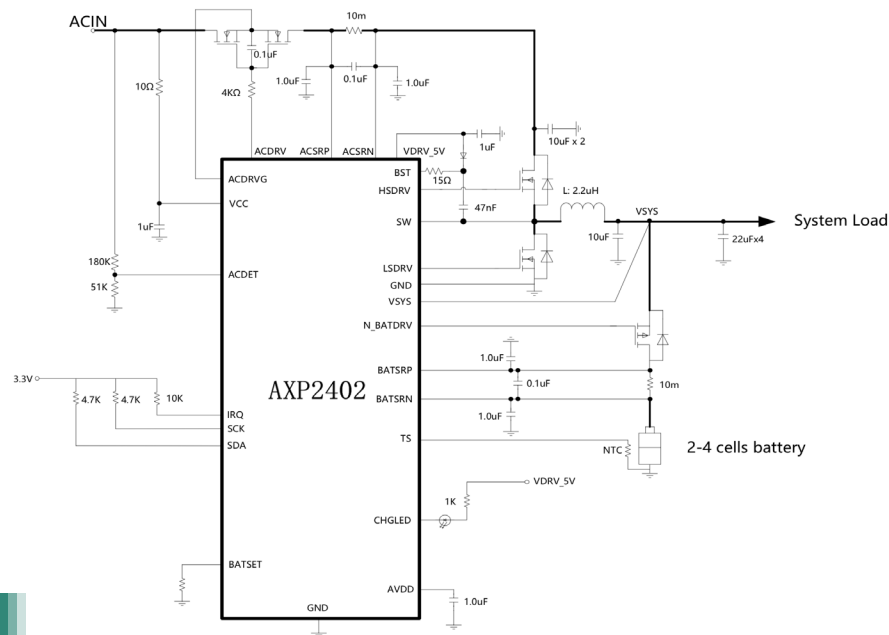
Applications

Ultra book, Portable Equipment, Notebook and Tablet PC

Product Overview



Block Diagram



Features

- **6V-24V NVDC Charger Controller For Fixed 2 Cells Battery**
 - Support Deeply Discharged Battery and No Battery Operation
- **Adapter Detection & Flexible Converter Switching Frequency**(600kHz-1.2MHz, step 200kHz)
 - Ultra-Low Quiescent Current of 900 μ A and High PFM Light Load Efficiency 80% At 20mA Load to meet Energy Star and ErP Lot 6
- **Integrate E-Gauge™**
 - Chip T-sensor/Battery T-sensor
 - Support TWSI Interface and Interrupt
 - Support JEITA Charging Guideline
 - Support LED Indication
 - Programmable Charge Voltage(8mV resolution),Charger Current(64mA resolution),Input Current(64mA resolution),Minimum System Voltage(256mV resolution)
 - Battery Charging Cycle Times Information
- **High Accuracy**
 - $\pm 0.5\%$ Charge Voltage Regulation
 - $\pm 10\%$ @2A Input/Charge Current Regulation
 - 12-bit ADC for Monitoring Adapter&Charge Current&Battery Voltage
- **Protection**
 - Adapter Under/Over-Voltage/Over-Current Protection
 - Battery Over-Voltage Protection
 - Battery Temp Sense From NTC Resistor
 - System Over-Voltage Protection
 - Charger Timeout Protection
 - Thermal Shutdown Protection

Footprint

QFN 5x5mm² 40-pin

Applications

Ultra book, Portable Equipment
Notebook and Tablet PC

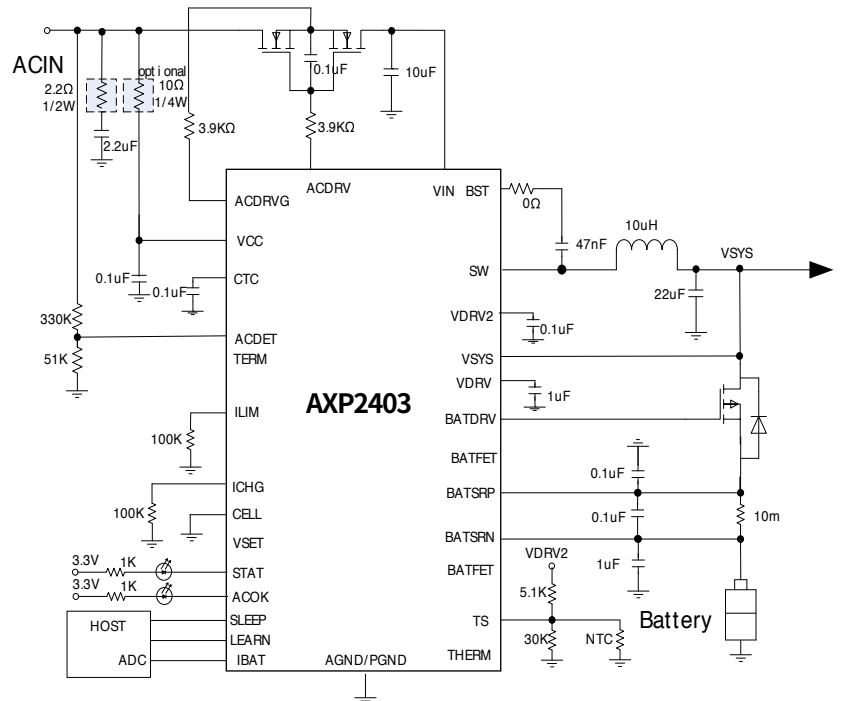
Product Overview



Features

- **6-24V Input Stand-alone NVDC 2-4S**
- Battery Charger Controller with switching MOSFET Integrated
- **Up to 96% efficiency for 4S application**
- Support Deeply Discharged Battery Operation
- Fixed 600kHz Switching Frequency
- **Ultra-Low Quiescent Current of 22uA at Battery Supply mode**
- **High Accuracy Battery Current Monitor**
- **Battery Charge Voltage**
- 2~4 Cell with 4.1V/4.2V/4.35V/4.4V Cell voltage
- **Integrated NMOS ACFET, RBFET Driver**
- Charging Status and Fault Indicator
- **High Accuracy**
- $\pm 0.5\%$ Charge Voltage Regulation
- $\pm 5\%$ @2A Charge Current Regulation
- $\pm 10\%$ @2A Input Current Regulation
- **Protection**
- Adapter Under-Voltage/Over-Voltage/Over-Current Protection
- Battery/System Over-Voltage Protection
- Battery Thermistor Sense Hot/Cold Charge Suspend
- Charger Timeout Protection
- Thermal Shutdown Protection

Block Diagram



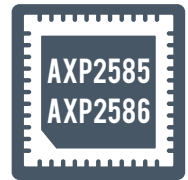
Footprint

QFN 4x4mm² 32-pin

Applications

- Robot and Portable Vacuum Cleaners
- Wireless speaker
- Drones and power tool
- Portable UPS

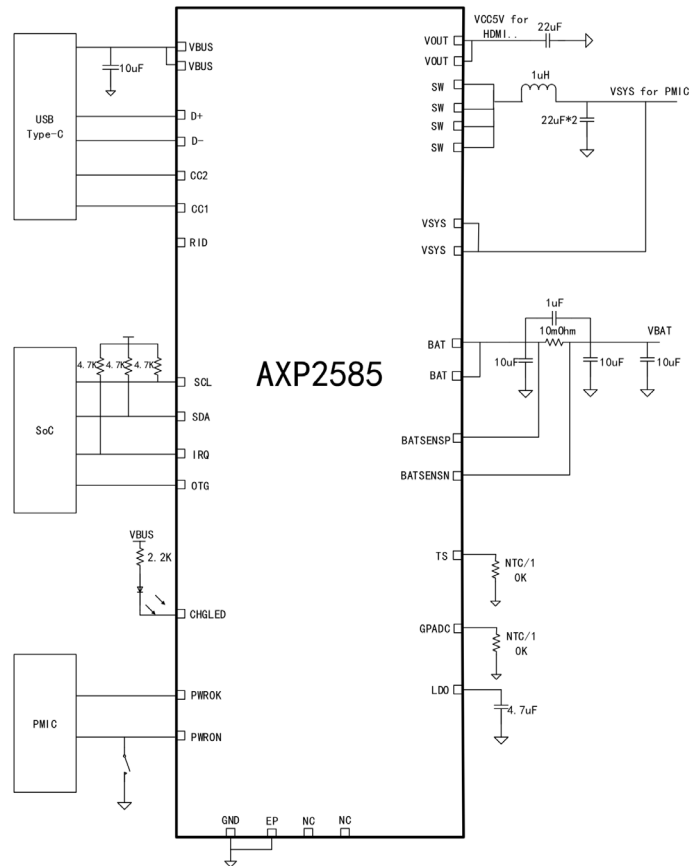
Product Overview



Features

- **3.9V–5.5 Input Operating Range and Support single Cell Battery**
- **Battery charge and discharge coulomb counter & E-gauge 2.0**
- Support TWSI(Two Wire Serial interface), and the slave address is 0x34(7 bits)
- **High efficiency 3A, 1uH inductor buck mode switch charger efficiency up to 94%**
- **Boost mode operation with adjustable output from 4.5V to 5.5V, and with current limit**
- Integrated control to switch between charge and boost mode
- Single input to support USB input
- Resistance compensation(IRCOMP) from charger output to cell terminal
- **High battery discharge efficiency with 18mohm battery discharge**

Block Diagram



- **BATFET control to support shipping mode, wake up and full system reset**
- Flexible autonomous and TWSI mode for optimal system performance
- **High integration includes all MOSFETS, current sensing and loop compensation**
- **Support BC1.2 and CC logic**
- **Protection**
 - Input Over-Voltage Protection
 - Battery Thermistor Sense Hot/Cold Charge Suspend
 - Programmable Safety Timer for Charger
 - Die Thermal Balance for Charger
 - Thermal Shutdown

Footprint

QFN 5x5mm² 32-pin

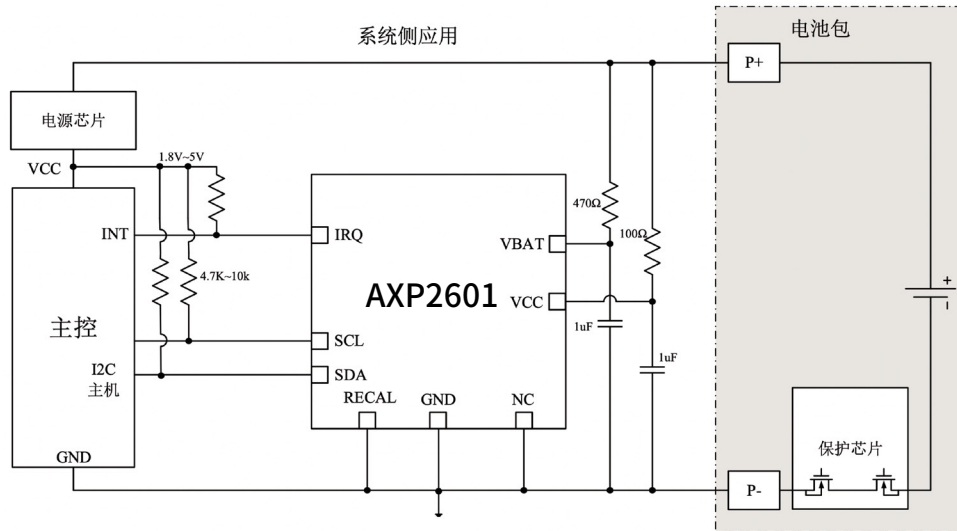
Applications

- AXP2585: Tablet, Smartphone, Portable Devices
- AXP2586: Smart Speaker, Mobile POS, Smart Door Lock

Product Overview



Block Diagram



Features

- System-Side or Pack-Side fuel Gauge for one cell Li-ion applications
- Integrated MCU and E-gauge 3.0 algorithm
- **3% Typical SOC Measurement Error**
- **14-bit Delta Sigma ADC for Temperature and Cell Voltage Measurement**
- Precision Voltage Measurement
- **Aging Self-Learning**
- **No Full-to-Empty Battery Learning Cycles Necessary**
- **No Sense Resistor Required**
- SOC and RRT available
- **Very low active and sleep power consumption**
 - normal mode typical current : <11uA
 - sleep mode typical current: <1uA
- **Additional Time-to-Empty and Time-to-Full Predictions**
- **External IRQ for warning available**
- I2C slave interface, up to 1MHz

Footprint

DFN 3x2mm² 8-pin

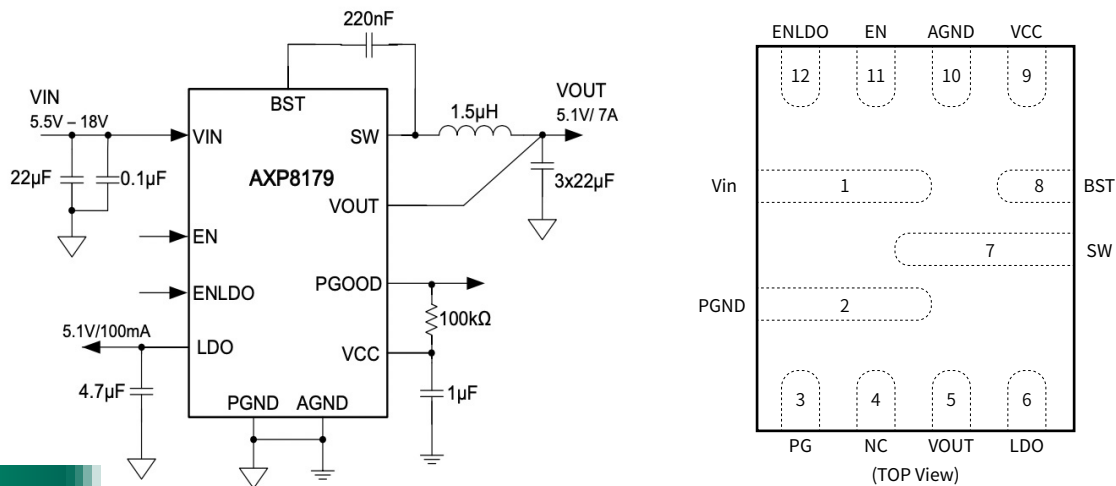
Applications

- Mobile Phones, Laptops, Tablets,
- Mini Projector, POS Terminal, IOT

Product Overview



Block Diagram



Features

- Wide 5.5V–18V Input Range
- 105uA Low Quiescent Current
- $\pm 3\%$ Reference Accuracy
- XCOT Control with Internal Compensation for Fast Transient
- Support Polymer Cap and All-MLCC
- Build in 5.1V/100mA LDO with Switching to VOUT as Input
- Output Discharge
- Ultrasonic Mode
- OCP, OVP, UVP, and Thermal Shutdown
- Integrated 24m Ω /13.4m Ω MOSFETs
- 600kHz Switching Frequency
- Efficiency up to 96.5%

Description

The AXP8179 is a fully integrated, high-frequency, synchronous, rectified, step-down switch mode converter with a fixed 5.1V output compact solution to achieve 7A continuous output current and 11 A valley output current over a wide input supply range with excellent load and line regulation. Based on adaptive constant-on-time control scheme with internal compensation, AXP8179 enables fast transient response and supports POSCAP and all MLCC output cap. AXP8179 provides a fixed 5.1V LDO, which can be used to power the external peripherals.

The feature set includes switching frequency of 600kHz, Internal soft startup, auto-skip, pre-biased startup, integrated bootstrap switch, power good, ultrasonic mode, enable and a full suite of fault protection schemes, including OCL, UVP, OVP, and thermal shutdown. It is packaged in 2mm x 3 mm 0.5mm pitch, 12-pin QFN package and specified from -40 °C - 125°C.

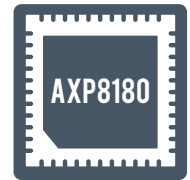
Footprint

QFN 3x2mm² 12-pin

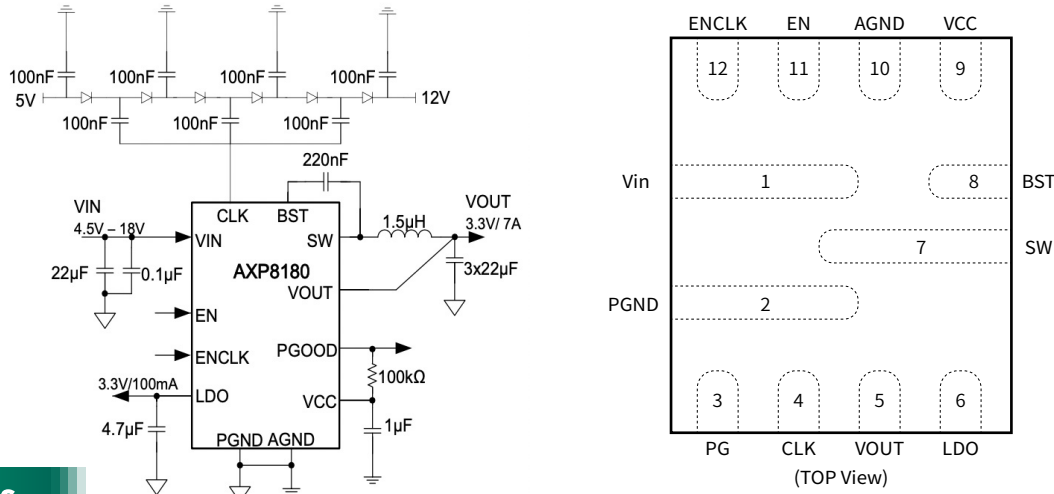
Applications

- Laptop/2-in-1 Computer
- Distributed Power Systems
- Set-top Box

Product Overview



Block Diagram



Features

- Wide 4.5V–18V Input Range
- 105uA Low Quiescent Current
- $\pm 3\%$ Reference Accuracy
- XCOT Control with Internal Compensation for Fast Transient
- Support Polymer Cap and All-MLCC
- Build in 3.3V/100mA LDO with Switching to VOUT as Input Source
- 11A Cycle-by-Cycle Inductor Valley Current Limit
- Internal Soft Startup
- Output Discharge
- Ultrasonic Mode
- OCP, OVP, UVP, and Thermal Shutdown
- Integrated 24m Ω /13.4m Ω MOSFETs
- 600kHz Switching Frequency
- Efficiency up to 96%

Description

The AXP8180 is a fully integrated, high-frequency, synchronous, rectified, step-down switch-mode converter with a fixed 3.3V output compact solution to achieve 7A continuous output current and 11 A valley output current over a wide input supply range with excellent load and line regulation. Based on adaptive constant-on-time control scheme with internal compensation, AXP8180 enables fast transient response and supports POSCAP and all MLCC output cap.

AXP8180 provides a fixed 3.3V LDO, which can be used to power the external peripheries. The feature set includes switching frequency of 600kHz, Internal soft startup, auto-skip, pre-biased startup, integrated bootstrap switch, power good, ultrasonic mode, enable and a full suite of fault protection schemes, including OCL, UVP, OVP, and thermal shutdown. It is packaged in 2mm x 3 mm 0.5mm pitch, 12-pin QFN package and specified from -40 °C-125°C.

Footprint

QFN 3x2mm² 12-pin

Applications

- Laptop/2-in-1 Computer
- Distributed Power Systems
- Set-top Box

Product Overview



Features

ADC Features

- **4-ch ADC, 108 dB dynamic range (A-weighted) @ 0 dB boost gain**
- **-95 dB THD+N @ 0 dB boost gain**
- 4 programmable boost amplifiers with 0dB to 30dB in 1dB step
- ADC sample rates supported: 8kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz, 96kHz
- Analog switching and digital mixer in record data path

Analog Input and output

- Four fully differential microphone inputs: MIC1P/N ~MIC4P/N
- Can be configured differential, single-ended mode
- Four low noise mic bias outputs: MIC1_BIAS~MIC4_BIAS
- Programmable bias voltage 1.5V to 3.4V
- 4uV noise level in signal bandwidth

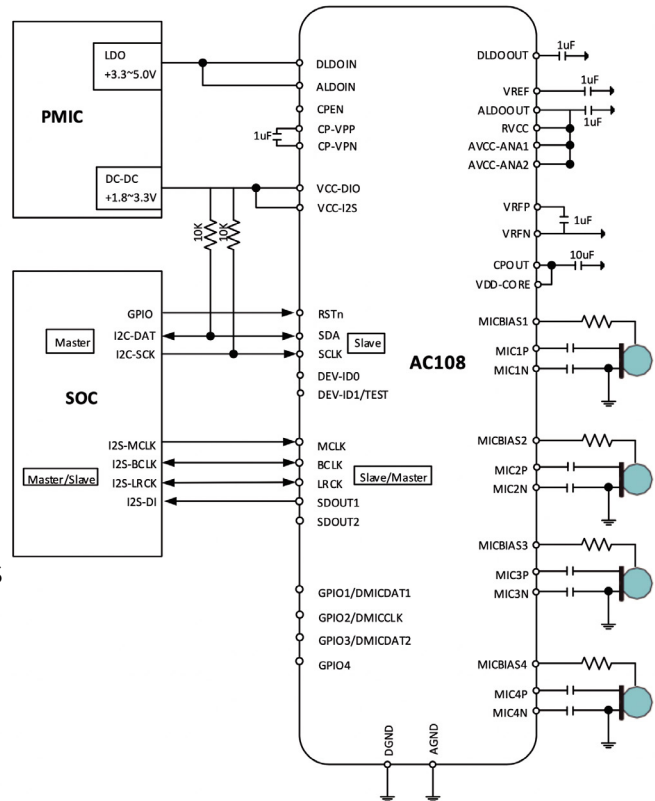
Digital Output

- Two digital microphone SCLK output@1M~3M
- Two I2S data output:
 - Can be configured as I2S/PCM format using 2 pins to output 4 channel data
 - Can be configured as TDM format using 1 pins to output 4 channel data even 16 channel of 4 devices
 - **Can be configured as Encoding format** using 1 pins to output 4 channel data even 16 channel of 4 devices

Other Features

- PLL support a wide input for 6-/12-MHz, 6.144-/12.288-MHz, 5.6448-/11.2896-MHz, 13MHz and 19.2MHz
- Integrated LDO allowing single supply (3.3V~5V)
- **3.6mA@3.3V per ADC channel for low power consumption application**
- TWI control interface support up to 400 kHz

Block Diagram



Footprint

QFN 6x6mm² 48-pin

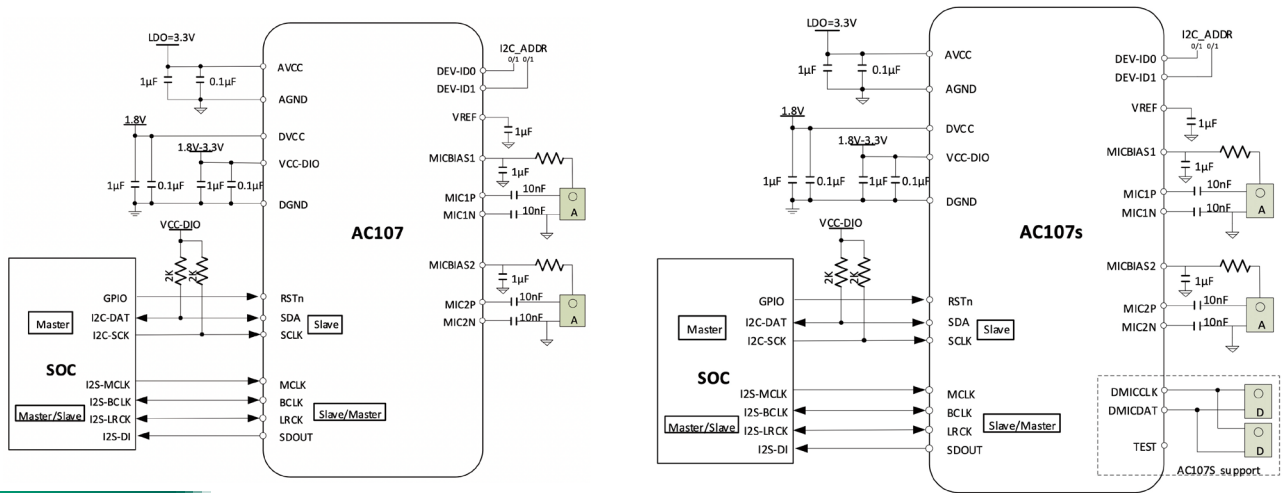
Applications

- Smart Voice Assistant Systems
- Voice Recorders
- Digital Cameras and video cameras
- Voice Conferencing System

Product Overview



Block Diagram



Features

ADC feature

- **2-ch ADC, 103 dB dynamic range (A-weighted) @ 0 dB boost gain**
- **-85 dB THD+N @ 0 dB boost gain**
- 2 programmable boost amplifiers with 0dB to 30dB in 1dB step
- ADC sample rates supported: 8kHz, 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz, 96kHz
- digital mixer in record data path

Analog Input and output

- Two fully differential microphone inputs: MIC1P/N ~MIC2P/N
- Two low noise mic bias outputs: MIC1_BIAS~MIC2_BIAS
- Programmable bias voltage 1.8V to 3.0V
- 4uV noise level in signal bandwidth

Digital In/Out

- One digital microphone SCLK output@1M~3M
- **One I2S data output transmits even 16 channel of 8 devices, support Encoding format**
- **One PDM output transmits internal 2-channel data, especially for echo cancellation paths**
- TWI control interface support up to 400 kHz

Low Power Consumption

- **2uW of standby mode**
- **7mW Mono 48ksps Record**
- **13mW Stereo 48ksps Record**
- **11mW Stereo 16ksps Record**

Footprint

- AC107: QFN 3x3mm² 20-pin
- AC107S: QFN 4x4mm² 24-pin

Applications

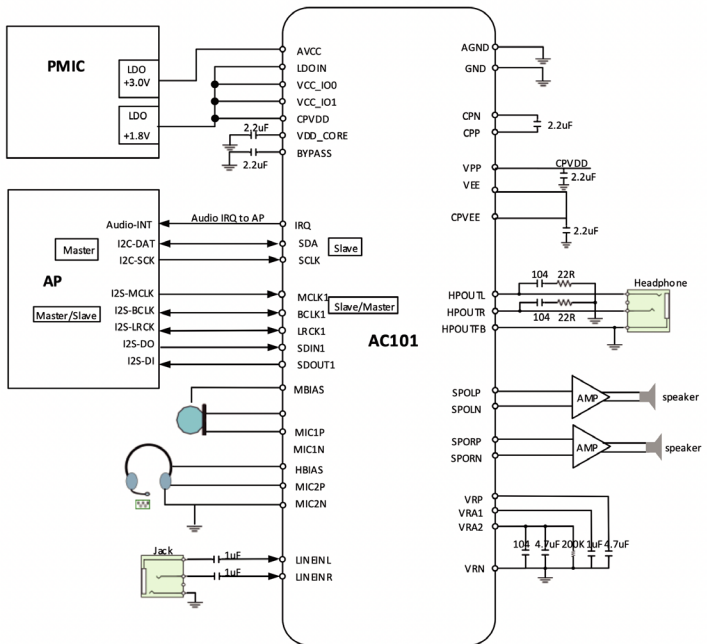
- Smart Voice Assistant Systems
- Digital Cameras and Video Cameras
- Voice Recorders
- Voice Conferencing System

Product Overview



Features

- **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**
 - Integrated charge pump for 0V reference
 - 18mW @1.8V driver
- **Two stereo differential speaker outputs** using external amplifier to drive the loud speaker
- **Differential Line output** with 1 Vrms full scale output voltage
- **Three audio inputs**
 - Two differential analog microphone inputs with 30dB~48dB boost amplifier gain
 - One mono differential or single-ended line-in input
 - Two low noise analog microphone bias
- **Audio jack insert/ button press detection**
 - I2C/RSB control interface
 - 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
 - Support one stereo digital microphone interface
- **16mW Mono 44.1ksps ADC MIC1 Record**
- **19mW Stereo 44.1ksps DAC to HPOUT**



Footprint

QFN 5x5mm² 40-pin

Applications

- Box
- Tablets
- Player/recorder/WiFi speaker

Product Overview



Features

ADC Features

- **Mono ADC with 101dB SNR typically(A-weight)**
- **-82 dB THD+N @ 0 dB gain and 1.0Vpp input**
- Mono Fully-differential analog microphone input with 0dB~31dB boost amplifier gain
- ADC sample rates supported: 8k, 11.025k, 12kHz, 16kHz,22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz
- Programmable Microphone Bias 1.81V~2.39V
- Support Automatic Gain Control (AGC) adjusting the ADC recording output

DAC Features

- **Mono DAC with 104dB SNR typically(A-weight)**
- **-88 dB THD+N @ 0dB line-out gain**
- Mono Fully-differential Line Output with 1.0Vrms maximum output voltage
- DAC sample rates supported: 8k, 11.025k, 12kHz, 16kHz,22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz
- 3 bands parametric Biquad filter for EQ in DAC path

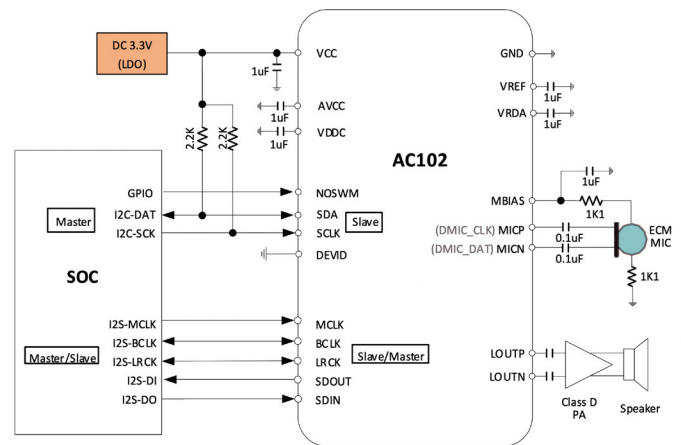
System

- One TWI control interface up to 400 kHz
- One 8KHz ~ 48KHz I2S/PCM interface
- Adjustable 44.1K/48K sample rate without software driver
- 2 Integrated LDOs, analog LDO output is 1.8V, digital LDO output is 1.2V

Low Power

- Support single 1.8V or 3.3V power supply;
- **2.64mA Mono 48ksps ADC Record with fully-differential analog microphone input**
- **2.97mA Mono 48ksps DAC Playback with line-out driver output**

Block Diagram



Footprint

QFN 3x3mm² 20-pin

Applications

- Portable audio applications
- Digital Cameras and video cameras
- Wireless headset
- Tablets and e-Books

**X-Powers strives to be the industry-leading
supplier of high-performance analog ICs
and total solutions.**



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