

AC1042A Datasheet

Zhuhai Jieli Technology Co.,LTD

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AC1042A Features

CPU Core

- 32-bit CPU, the highest frequency is 160MHz
- Maximum 16KB 4Way ICache, configurable part Way as a common memory for the CPU use or other Peripheral

Memory

- On-chip 32KB SRAM(not including ICache)
- ICache SRAM: 4KB~12KB configurable

Clock Source

- RC Clock frequency about 16MHz
- LRC(low power RC) clock frequency about 32KHz
- HTC(low drift internal high frequency RC)clock frequency is 5MHz

Digital I/O

- 9 programmable digital I/O pins
- USB DP/DM can be configured to normal I/O pins
- General the IO supports pull-up(10k),pull-down(60k), strong,weak output,input and high impedance
- Up to 8 external interrupt/wake-up source(low power available,can be multiplexed to any I/O, with hardware filter)
- Input channel and Output channel, provide arbitrary IO input and output options for some modules

Digital peripherals

- One Full Speed USB 1.1 PHY
- Two UART Controllers(UART0/1)

UART1 supports DMA and Flow Control

- Two SPI Controllers with DMA(SPI0/1) support master mode and slave mode,SPI0 support 4bit,SPI1support 2bit
- One Spi Flash Controller to run code
- One SD host controller
- Two 16-bit Asynchronous Divider Timers
- IIS for digital Audio streaming, supports host and device mode
- One IIC Controller
- Four channel PWM output
- Infrared remote control decoder
- Watchdog
- 64-bit EFUSE

Analog Peripherals

- MIC amplifier circuit
- Two analog audio input channels
- 10-bit high precision ADC
- 16-bit high precision ADC (mainly as recording)
- 16-bit high precision DAC
- Low voltage protection
- Power on reset

Operating Conditions

- Working voltage
VBAT: 2.0v - 5.5v
HPVDD: 2.0v - 5.5v
VDDIO: 2.0v - 3.4v
- Operating Temperature: -40°C to +85°C

Package

- SOP16

Application

- Sound Toy
- Audio player

1、 Pin Definition

1.1 Pin Assignment

PB0	○		16	VCOM
VSSIO	1		15	AGND
VDDIO	2		14	PB1
VBAT	3		13	PA13
PA2/PA12	4	AC1042A	12	PA14/PA15
	5	(SOP16)	11	PA0
PA11	6		10	USBDP
PA10	7		9	USBDM
PA9	8			

Figure 1-1 AC1042A_SOP16 Package Diagram

1.2 Pin Description

Table 1-1 AC1042A_SOP16 Pin Description

PIN NO.	Name	Type	Drive (mA)	Function	Description
1	PB0	I/O	8/64	GPIO	DAC:Analog Audio Output; ADC13:ADC Input Channel 13; LVD:Low Voltage Detect;
2	VSSIO	G	/		Digital Ground;
3	VDDIO	P	/		GPIO Power;
4	VBAT	P	/		Battery Power Supply;
5	PA2	I/O	8/64	GPIO	ADC2:ADC Input Channel 2; SPI0DOB(0):SPI0 Data0 Out(B); SD0CMDA:SD0 Command(A); I2C_SDA(B); PWM2H;
	PA12	I/O	8/64	GPIO	I2S_LRCK:Audio Link Word Select; SPI1DOB:SPI1 Data Out(B); SD0CMDB:SD0 Command(B); MCAP3:Motor Timer3 Capture;
6	PA11	I/O	8/64	GPIO	ADC9:ADC Input Channel 9; I2S_SCLK:Audio Link Serial Clock; SPI1CLKB:SPI1 Clock(B); SD0CLKB:SD0 Clock(b); MCAP2:Motor Timer2 Capture;
7	PA10	I/O	8/64	GPIO	ADC8:ADC Input Channel 8; I2S_DAT3:Audio Link Data3; SPI1DIB:SPI1 Data In(B); SD0DATB:SD0 Data(B); TMR1:Timer1 Clock In; MCAP1:Motor Timer1 Capture;
8	PA9	I/O	8	GPIO (High Voltage Resistance)	I2S_DAT2:Audio Link Data2; UART1TXB:Uart1 Data Out(B); UART1RXB:Uart1 Data In(B); I2C_SDA(D); CAP1:Timer1 Capture; PWM3:PWM Channel3 Output;

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9	USBDM	I/O	10	USB Negative Data (pull down)	ADC5:ADC Input Channel 5; SPI1DOA:SPI1 Data Out(A); SD0DATC:SD0 Data(C); UART1TXA:Uart1 Data Out(A); I2C_SDA(A);
10	USBDP	I/O	10	USB Positive Data (pull down)	ADC4:ADC Input Channel 4; SPI1CLKA:SPI1 Clock(A); UART1RXA:Uart1 Data In(A); I2C_SCL(A);
11	PA0	I/O	8/64	GPIO (pull up)	Long Press Reset; ADC0:ADC Input Channel 0; UART0TXB:Uart0 Data Out(B);
12	PA15	I/O	8/64	GPIO	ADC12:ADC Input Channel 12; MIC_LDO:Microphone Power Output;
	PA14	I/O	8/64	GPIO	ADC11:ADC Input Channel 11; AUX1:Analog Channel 1 Input;
13	PA13	I/O	8/64	GPIO	ADC10:ADC Input Channel 10; AUX0:Analog Channel 0 Input; MIC_BIAS:Microphone Bias Output; CAP0:Timer0 Capture
14	PB1	I/O	8/64	GPIO	MIC_IN: MIC Input Channel;
15	AGND	G	/		Analog Ground;
16	VCOM	P	/		Analog Reference;

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2、Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+85	°C
Tstg	Storage temperature	-65	+150	°C
VBAT	Supply Voltage	-0.3	5.5	V
V _{VDDIO33}	3.3V IO Input Voltage	-0.3	3.6	V

Note : The chip can be damaged by any stress in excess of the absolute maximum ratings listed below

2.2 PMU Characteristics

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.0	3.7	5.5	V	—
V _{VDDIO}	Voltage output	2.0	3.0	3.4	V	VBAT = 3.7V, 100mA loading
I _{VDDIO}	Loading current	—	—	100	mA	VBAT=3.7V

2.4 IO Input/Output Electrical Logical Characteristics

Table 2-3

IO input characteristics						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V _{IL}	Low-Level Input Voltage	-0.3	—	0.3* VDDIO	V	VDDIO = 3.3V
V _{IH}	High-Level Input Voltage	0.7* VDDIO	—	VDDIO+0.3	V	VDDIO = 3.3V
IO output characteristics						
V _{OL}	Low-Level Output Voltage	—	—	0.33	V	VDDIO = 3.3V
V _{OH}	High-Level Output Voltage	2.7	—	—	V	VDDIO = 3.3V

2.5 Internal Resistor Characteristics

Table 2-4

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA0~PA15 PB0、PB1	8mA	64mA	10K	60K	1、PA0 default pull up 2、USBDM & USBDP default pull down 3、internal pull-up/pull-down resistance accuracy $\pm 20\%$
PA9 (high voltage I/O)	8mA	–	10K	60K	
USBDP	10mA	–	1.5K	15K	
USBDM	10mA	–	180K	15K	

2.6 Analog DAC(PB0) Characteristics

Table 2-5

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	–	16K	Hz	1KHz/0dB 100kohm loading With A-Weighted Filter
THD+N	–	-65	–	dB	
S/N	–	95	–	dB	
Output Swing	–	0.54	–	Vrms	
Dynamic Range	–	92	–	dB	1KHz/-60dB 100kohm loading With A-Weighted Filter
Output Resistance	–	8.3	–	K	–

2.7 ADC Characteristics

Table 2-6

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range	–	75	–	dB	1KHz/210mVrms line mode :6dB with cap PGAIS=2
S/N	–	79	–	dB	
THD+N	–	-70	–	dB	

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3、 Package Information

3.1 SOP16

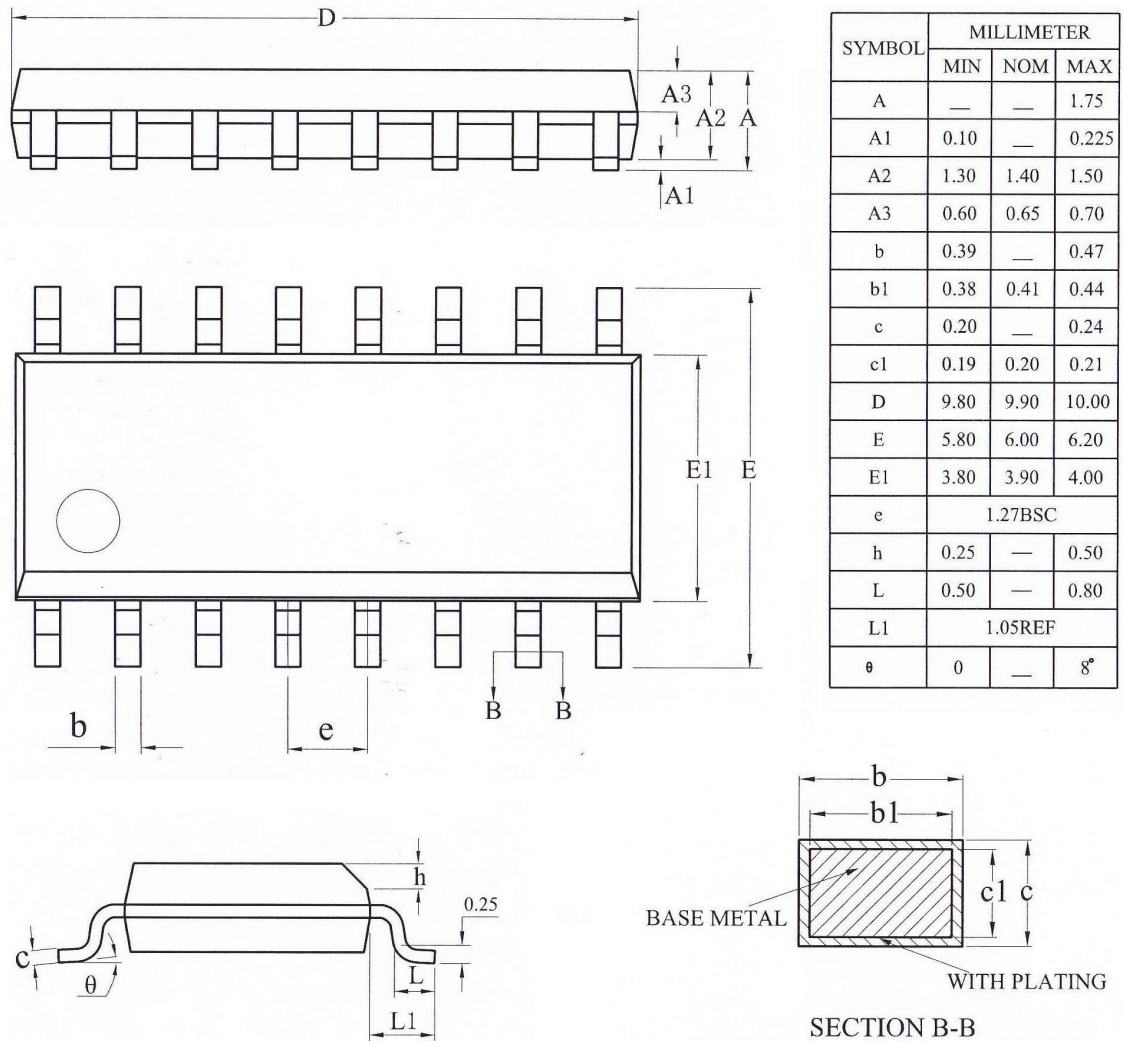


Figure 3-1. AC1042A_SOP16 Package

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4、 Revision History

Date	Revision	Description
2020.12.25	V1.0	Initial Release

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