

# **AC6084A2 Datasheet**

**Zhuhai Jieli Technology Co.,LTD**

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## AC6084A2 Features

### CPU

- 32-bit DSP supports hardware Float Point Unit (FPU)
- Up to 160MHz programmable processor
- 64 Vectored interrupts
- 4 Levels interrupt priority

### DSP Audio Processing

- Supports MP2, MP3, WMA audio decoding
- 10-band EQ configuration for voice Effects
- Built-in microphone echo function

### Audio Codec

- Two channels 16-bit DAC, SNR  $\geq$  92dB
- One channels 16-bit ADC , SNR  $\geq$  90dB
- Sampling rates of 8KHz/11.025KHz/16KHz/22.05KHz/24KHz/32KHz/44.1KHz/48KHz are supported
- One analog MIC amplifier, build-in MIC bias generator
- Two channels Mono analog MUX
- Supports cap-less, single-ended, and differential mode at the DAC path
- Supports 16ohm and 32ohm Speaker loading

### Peripherals

- Full speed USB 2.0 OTG controller

- Multi-function 32-bit timers, support capture and PWM mode
- Three full-duplex basic UART, UART0 and UART1 supports DMA mode
- Two SPI interface supports host and device mode
- One hardware IIC interface supports host and device mode
- 10-bit ADC for analog sampling
- External wake up/interrupt on all GPIOs

### PMU

- Low voltage LDO for internal digital and analog circuit supply
- 3uA current consumption in the soft-off mode
- Built-in LDO for the core, I/O and flash
- VBAT is 2.2V to 5.5V
- VDDIO is 2.2V to 3.6V

### Packages

- QSOP24

### Temperature

- Operating temperature: -40°C to +85°C
- Storage temperature: -65°C to +150°C

### Applications

- Card MP3 player speaker

# 1、 Pin Definition

## 1.1 Pin Assignment

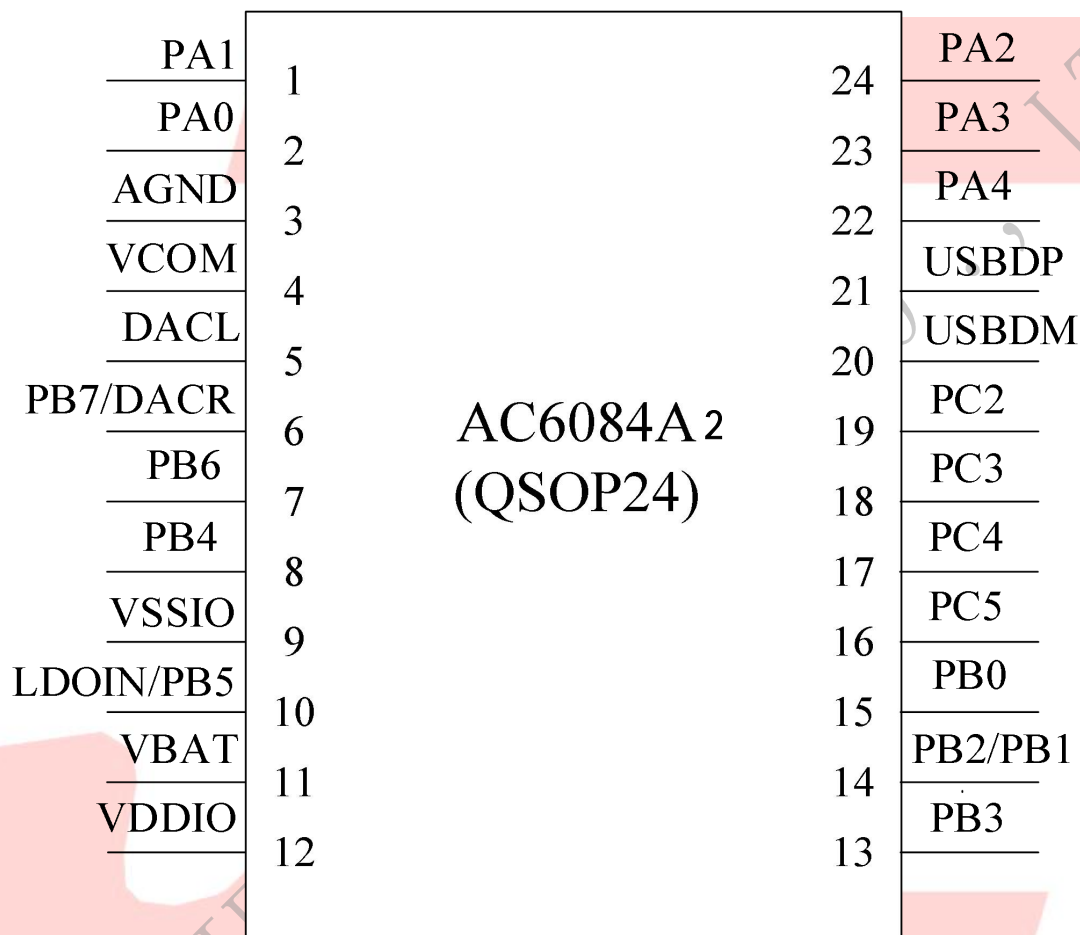


Figure 1-1 AC6084A\_QSOP24 Package Diagram

## 1.2 Pin Description

Table 1-1 AC6084A\_QSOP24 Pin Description

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
1	PA1	I/O	24/8	GPIO	MIC: MIC Input Channel ; ADC1: ADC Input Channel 1; PWM4: Timer4 PWM Output; UART1RXC: Uart1 Data In(C);
2	PA0	I/O	24/8	GPIO	SDPG: SD Power Supply; ADC0: ADC Input Channel 0; CLKOUT0; UART1TXC: Uart1 Data Out(C);
3	AGND	P	/		Analog Ground
4	VCOM	P	/		DAC Reference
5	DACL	O	/		DAC Left Channel
	DACR	O	/		DAC Right Channel
6	PB7	I/O	24/8	GPIO	SD0CLK_B: SD0 Clock(B); SD0CLK_F: SD0 Clock(F); SPI2DOA: SPI2 Data Out(A); AMUX1R: Analog Channel1Right; IIC_SDA_C: IIC DAT(C); ADC9: ADC Input Channel 9; PWM5: Timer5 PWM Output; UART1RXA: Uart1 Data In(A);
7	PB6	I/O	24/8	GPIO	SD0CMD_B: SD0 Command(B); SD0CMD_F: SD0 Command(F); SPI2CLKA: SPI2 Clock(A); AMUX1L: Analog Channel1 Left; IIC_SCL_C: IIC SCL(C); ADC8: ADC Input Channel 8; TMR3: Timer3 Clock Input; UART1TXA: Uart1 Data Out(A);
8	PB4	I/O	24/8	GPIO	SD0DAT_F: SD0 Data(F); ADC7: ADC Input Channel 7; LVD: Low Voltage Detect; UART2TXC: Uart2 Data Out(C); UART2RXC: Uart2 Data In(C); CLKOUT1; Q-decoder2_0;

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9	VSSIO	P	/		IO Ground
10	LDOIN	P	/		Battery Charger In
	PB5	I/O	8	GPIO (High Voltage Resistance)	SD0DAT_B: SD0 Data(B); SPI2DIA: SPI2 Data Input(A); PWM3: Timer3 PWM Output; CAP1: Timer1 Capture; UART0TXC: Uart0 Data Out(C); UART0RXC: Uart0 Data In(C); Q-decoder2_1;
11	VBAT	P	/		Battery Power Supply
12	VDDIO	P	/		IO Power 3.3v
13	PB3	I/O	24/8	GPIO	SD0DAT_D: SD0 Data(D); ADC6: ADC Input Channel 6; PWM2: Timer2 PWM Output; UART2RXB: Uart2 Data In(B); Q-decoder1_1;
14	PB2	I/O	8	GPIO (High Voltage Resistance)	SD0CMD_D: SD0 Command(D); SPI1DIA: SPI1 Data In(A); UART2TXB: Uart2 Data Out(B); CAP0: Timer0 Capture; Q-decoder1_0;
	PB1	I/O	24/8	GPIO	Long Press Reset; SPI1DOA: SPI1 Data Out(A); ADC5: ADC Input Channel 5; UART0RXB: Uart0 Data In(B); TMR2: Timer2 Clock Input;
15	PB0	I/O	8	GPIO (High Voltage Resistance)	SD0CLK_D: SD0 Clock(D); SPI1CLKA: SPI1 Clock(A); UART0TXB: Uart0 Data Out(B); TMR5: Timer5 Clock Input;
16	PC5	I/O	24/8	GPIO	SD0CLK_A: SD0 Clock(A); SD0CLK_E: SD0 Clock(E); SPI1DOB: SPI1 Data Out(B); IIC_SDA_B: IIC SDA(B); ADC12: ADC Input Channel 12; TMR1: Timer1 Clock Input; UART2RXD: Uart2 Data In(D);

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17	PC4	I/O	24/8	GPIO	SD0CMD_A: SD0 Command(A); SPI1CLKB: SPI1 Clock(B); IIC_SCL_B: IIC SCL(B); ADC11: ADC Input Channel 11; PWM1: Timer1 PWM Output; UART2TXD: Uart2 Data Out (D);
18	PC3	I/O	24/8	GPIO	SD0DAT_A: SD0 Data(A); SPI1DIB: SPI1 Data In(B); CAP2: Timer2 Capture; UART0TXD: Uart0 Data Out (D); UART0RXD: Uart0 Data In(D);
19	PC2	I/O	24/8	GPIO	ADC10: ADC Input Channel 10; CAP5: Timer5 Capture; UART1RXB: Uart1 Data In(B);
20	USBDM	I/O	4	USB Negative Data (pull down)	SD0DAT_E: SD0 Data(E); SPI2DOB: SPI2 Data Out(B); IIC_SDA_A: IIC SDA(A); ADC14: ADC Input Channel 14; UART1RXD: Uart1 Data In(D);
21	USBDP	I/O	4	USB Positive Data (pull down)	SPI2CLKB: SPI2 Clock(B); IIC_SCL_A: IIC SCL(A); ADC13: ADC Input Channel 13; UART1TXD: Uart1 Data Out(D);
22	PA4	I/O	24/8	GPIO	SD0CMD_C: SD0 Command(C); SD0CMD_E: SD0 Command(E); AMUX0R: Analog Channel0 Right; UART1_RTS: Uart1 Request to send; ADC3: ADC Input Channel 3; TMR4: Timer4 Clock Input; UART2RXA: Uart2 Data In(A); Q-decoder0_1;
23	PA3	I/O	24/8	GPIO	SD0DAT_C: SD0 Data(C); AMUX0L: Analog Channel0 Left; ADC2: ADC Input Channel 2; UART1_CTS: Uart1 Clear to send; UART2TXA: Uart2 Data Out(A); PWM5: Timer5 PWM Output; Q-decoder0_0;
24	PA2	I/O	24/8	GPIO	SD0CLK_C: SD0 Clock(C); MIC_BIAS: Microphone Bias Output; CAP3: Timer3 Capture;

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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 <sub>3.3IO</sub>	3.3V IO Input Voltage	-0.3	3.6	V
LDOIN	Charge Input Voltage	-0.3	6.0	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
LDOIN	Loading current	–	–	250	mA	VBAT = 4.2V
VBAT	Voltage Input	2.2	3.7	5.5	V	–
V <sub>VDDIO</sub>	Voltage output	–	3.3	–	V	VBAT = 4.2V, 100mA loading

### 2.3 Battery Charge

Table 2-3

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
LDOIN	Charge Input Voltage	4.5	5	5.5	V	–
V <sub>Charge</sub>	Charge Voltage	4.15	4.2	4.25	V	–
I <sub>Charge</sub>	Charge Current	20	–	250	mA	Charge current at fast charge mode
I <sub>Trinkl</sub>	Trickle Charge Current	20	45	70	mA	V <sub>BAT</sub> < V <sub>Trinkl</sub>

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## 2.4 IO Input/Output Electrical Logical Characteristics

Table 2-4

IO input characteristics						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V <sub>IL</sub>	Low-Level Input Voltage	-0.3	–	0.3* VDDIO	V	VDDIO = 3.3V
V <sub>IH</sub>	High-Level Input Voltage	0.7* VDDIO	–	VDDIO+0.3	V	VDDIO = 3.3V
IO output characteristics						
V <sub>OL</sub>	Low-Level Output Voltage	–	–	0.33	V	VDDIO = 3.3V
V <sub>OH</sub>	High-Level Output Voltage	2.7	–	–	V	VDDIO = 3.3V

## 2.5 Internal Resistor Characteristics

Table 2-5

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA0~PA4 PB1,PB4 PB6,PB7 PC2~PC5	8mA	24mA	10K	10K	1、PB1 default pull up 2、USBDM & USBDP default pull down 3、internal pull-up/pull-down resistance   accuracy ±20%
PA0 PB3	Output 0	8mA	10K	10K	
	Output 1	8mA			
PB0,PB2,PB5	8mA	–	10K	10K	
USBDP	4mA	–	1.5K	15K	
USBDM	4mA	–	180K	15K	

## 2.6 DAC Characteristics

Table 2-6

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	–	20K	Hz	1KHz/0dB 10Kohm loading With A-Weighted Filter
THD+N	–	-72	–	dB	
S/N	–	92	–	dB	
Crosstalk	–	-80	–	dB	
Output Swing	–	1	–	V <sub>rms</sub>	
Dynamic Range	–	90	–	dB	1KHz/-60dB 10Kohm loading With A-Weighted Filter
DAC Output Power	11	–	–	mW	32ohm loading

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## 2.7 ADC Characteristics

Table 2-7

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range	–	80	–	dB	1KHz/-60dB
S/N	–	90	91	dB	1KHz/-60dB
THD+N	–	-70	–	dB	
Crosstalk	–	-90	–	dB	

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## 3、 Package Information

### 3.1 QSOP24

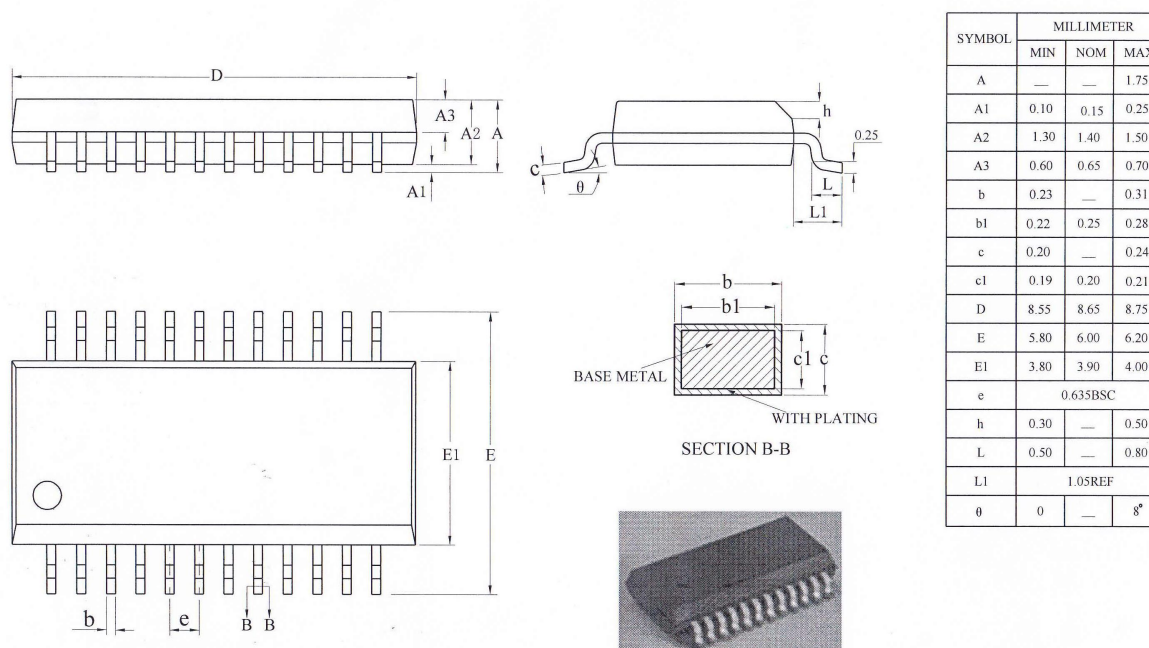


Figure 3-1. AC6084A\_QSOP24 Package

## 4、 Revision History

Date	Revision	Description
2020.10.13	V1.0	Initial Release

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