AC6926A Datasheet

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Version：V1.0

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AC6926A Features

High performance 32-bit RISC CPU

- RISC 32-bit CPU
- DC-160MHz operation
- Support DSP instructions
- 64Vectored interrupts
- 4 Levels interrupt priority

Flexible I/O

- 19 GPIO pins
- All GPIO pins can be programmable as input or output individually
- All GPIO pins are internal pull-up/pull-down selectable individually
- CMOS/TTL level Schmitt triggered input
- External wake up/interrupt on all GPIOs

Peripheral Feature

- One full speed USB 2.0 OTG controller
- One audio interface supports IIS, left adjusted, right adjusted and DSP mode
- Four multi-function 16-bit timers, support capture and PWM mode
- Three 16-bit PWM generator for motor driving
- One 16-bit active parallel port
- One full-duplex basic UART
- Two full-duplex advanced UART
- One SPI interface supports host and device mode
- Two SD Card Host controller
- One IIC interface supports host and device mode
- One SPDIF receiving interface without analog amplify
- One Quadrate decoder
- Watchdog
- 1 Crystal Oscillator
- 16-bit Stereo DAC with headphone amplifier, SNR >= 95dB
- 1 channel ADC , SNR >= 90dB
- 1 channel MIC amplifier
- 2 channels Stereo analog MUX
- 10 channels 10-bit ADC
- 2 channels 8 levels Low Voltage Detector
- Power-on reset
- Embedded PMU support low power mode

Bluetooth Feature

- CMOS single-chip fully-integrated radio and baseband
- Compliant with Bluetooth V5.0 specfication

- Bluetooth Piconet and Scatternet support
- Meet class2 and class3 transmitting power requirement
- Support GFSK and π/4 DQPSK all paket types
- Provides +2dbm transmitting power
- receiver with -89dBm sensitivity
- Support a2dp\avctp\avdtp\avrcp\hfp\spp\smp\att\gap\gatt\rfcomm\sdp\l2cap profile

FM Tuner

- Support worldwide frequency band 76-108MHz
- Fully integrated digital low-IF tuner & frequency synthesizer
- Autonomous search tuning
- Digital auto gain control (AGC)
- Digital adaptive noise cancellation
- Programmable de-emphasis (50/75 uS)
- Receive signal strength indicator (RSSI)
- Radio search in multi-channel simultaneously
- Digital volume control

Power Supply

- VBAT is 2.2V to 5.5V
- VDDIO is 2.2V to 3.6V
- RTCVDD is 2.2V to 3.6V

Packages

- QFN32(4mm*4mm)

Temperature

- Operating temperature: -20℃ to +70℃
- Storage temperature: -65℃ to +150℃

1、Pin Definition

1.1 Pin Assignment

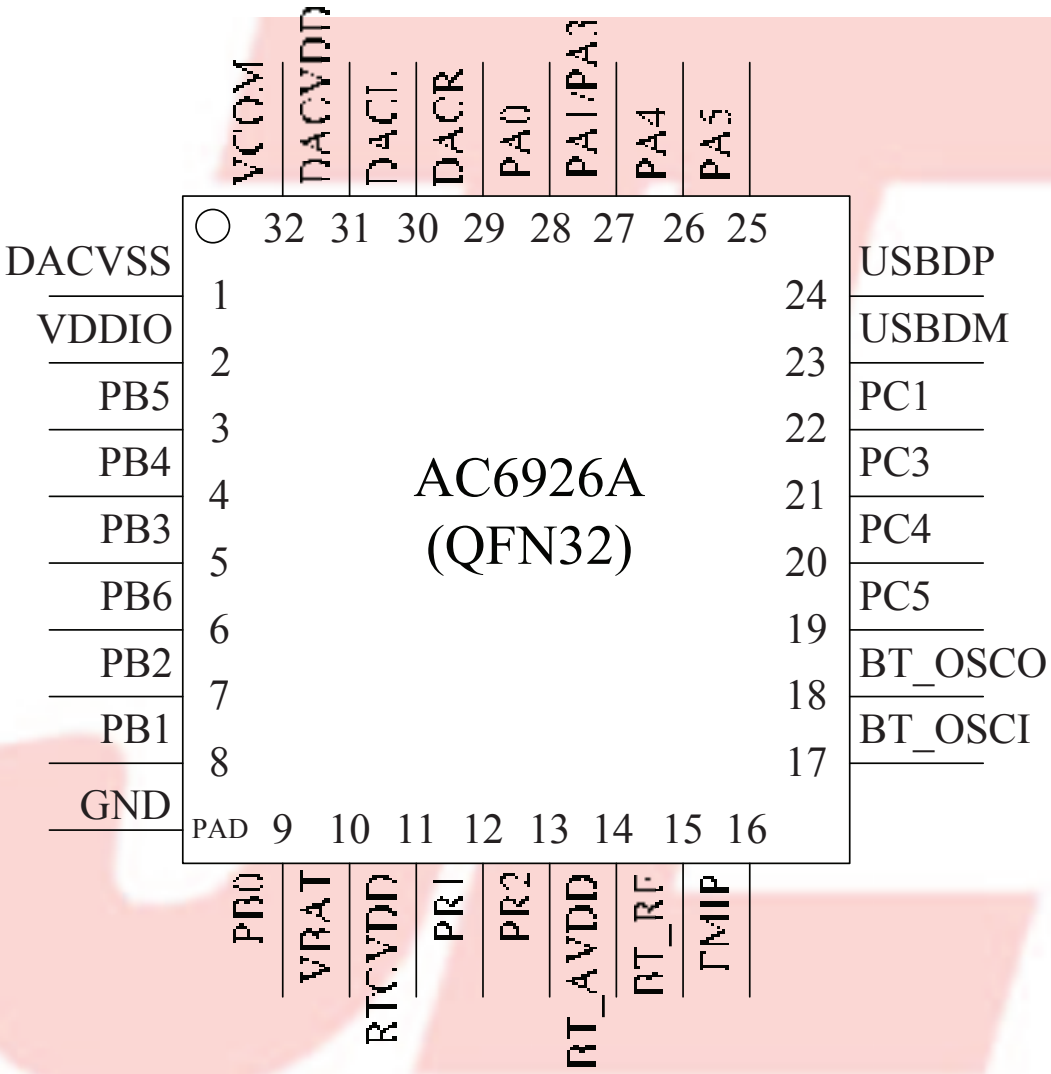

Figure 1-1 AC6926A_QFN32 Package Diagram

1.2 Pin Description

Table 1-1 AC6926A_QFN32 Pin Description

PIN NO.	Name	I/O Type	High Drive (mA)	Function	Other Function
1	DACVSS	P	/	Ground	
2	VDDIO	P	/	IO Power 3.3v	
3	PB5	I/O	8	GPIO	UART0TXB：Uart0 Data Out(B); AMUX0R：Simulator Channel0 Right; SPI1DOA：SPI1 Data Out(A); SD0CLKB：SD0 Clock(B); ADC9：ADC Input Channel 9; Touch5：Touch Input Channel 5;
4	PB4	I/O	8	GPIO	PWM3：Timer3 PWM Output; AMUX0L：Simulator Channel0 Left; SPI1CLKA：SPI1 Clock(A); SD0CMDB：SD0 Command(B); ADC8：ADC Input Channel 8; SPI0_DAT2AB(2)：SPI0 Data2(AB); Touch4：Touch Input Channel 4;
5	PB3	I/O	8	GPIO	PWM2：Timer2 PWM Output; UART2RXC：Uart2 Data In(C); SPI1DIA：SPI1 Data In(A); SD0DAT0B：SD0 Data0(B); AMUX2R：Simulator Channel2 Right; SPI0_DAT3AB(3)：SPI0 Data3(AB); Touch3：Touch Input Channel 3;
6	PB6	I/O	8	GPIO	AMUX2L：Simulator Channel2 Left; SPI0_DIB(1)：SPI0 Data In(B); Touch6：Touch Input Channel 6;
7	PB2	I/O	8	GPIO	UART2TXC：Uart2 Data Out(C); SPI2DIA：SPI2 Data In(A); SPI0_CLKB：SPI0 Clock(B); Touch2：Touch Input Channel 2;
8	PB1	I/O	8	GPIO	TMR2：Timer2 Clock Input; UART1RXA：Uart1 Data In(A); SPI2DOA：SPI2 Data Out(A); ADC7：ADC Input Channel 7; Touch1：Touch Input Channel 1;
9	PB0	I/O	8	GPIO	PWMH2L

					SPI2CLKA：SPI2 Clock(A); UART1TXA：Uart1 Data Out(A); ADC6：ADC Input Channel 6; Touch0：Touch Input Channel 0;
10	VBAT	P	/	LDO Power	
11	RTCVDD	P	/	RTC Power 3.3v	
12	PR1	I/O	10	RTCIO1 (output 0V)	RESET1： ADC12：ADC Input Channel 12;
13	PR2	I/O	10	RTCIO2 (pull up)	RESET2： ADC12：ADC Input Channel 12;
14	BT_AVDD	P	/	BT Power 1.3v	
15	BT_RF	P	/		
16	FMIP	I	/		
17	BT_OSCI	I	/	BT OSC In	
18	BT_OSCO	O	/	BT OSC Out	
19	PC5	I/O	24	GPIO	PWMH1L SD1CLKA：SD1 Clock(A); SPI1DOB：SPI1 Data Out(B); UART2RXD：Uart2 Data In(B); IIC_SDA_B：IIC SDA(B);
20	PC4	I/O	24	GPIO	SD1CMDA：SD1 Command(A); SPI1CLKB：SPI1 Clock(B); UART2TXD：Uart2 Data Out(B); IIC_SCL_B：IIC SCL(B);
21	PC3	I/O	24	GPIO	SD1DAT0A：SD1 Data0(A); SPI1DIB：SPI1 Data In(B); UART0RXC：Uart0 Data In(C); TMR3：Timer3 Clock Input; ADC10：ADC Input Channel 10;
22	PC1	I/O	24	GPIO	PWMH1H UART1RXB：Uart1 Data In(B);
23	USBDM	I/O	4	USB Negative Data (pull down)	UART1RXD：Uart1 Data In(D); ADC11：ADC Input Channel 11;
24	USBDP	I/O	4	USB Positive Data (pull down)	UART1TXD：Uart1 Data Out(D);
25	PA5	I/O	24	GPIO	ADC2：ADC Input Channel 2; Touch12：Touch Input Channel 12;
26	PA4	I/O	24	GPIO	PWM1：Timer1 PWM Output; AMUX1R：Simulator Channel1 Right; ADC1：ADC Input Channel 1; UART2RXA：Uart2 Data In(A);

					Touch11：Touch Input Channel 11;
27	PA1	I/O	24	GPIO	PWM0：Timer0 PWM Output; UART1TXC：Uart1 Data Out(C); Touch8：Touch Input Channel 8;
	PA3	I/O	24	GPIO	AMUX1L：Simulator Channel1 Left; ADC0：ADC Input Channel 0; UART2TXA：Uart2 Data Out(A); Touch10：Touch Input Channel 10;
28	PA0	I/O	24	GPIO	MIC：MIC Input Channel; UART0RXB：Uart0 Data In(B);
29	DACR	O	/	DAC Right Channel	
30	DACL	O	/	DAC Left Channel	
31	DACVDD	P	/	DAC Power	
32	VCOM	P	/	DAC Reference	

2、Electrical Characteristics

2.1 PMU Characteristics

Table 2-1

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.2	3.7	5.5	V	
$V_{3.3}$	Voltage output	_	3.3	_	V	LDO5V = 5V, 100mA loading
$V_{1.2}$		_	1.2	_	V	LDO5V = 5V, 50mA loading
$V_{1.3}$	Voltage output		1.3		V	LDO5V=5V, 100mA loading
V_{DACVDD}	DAC Voltage	_	3.1	_	V	LDO5V = 5V, 10mA loading
$I_{L3.3}$	Loading current	_	_	150	mA	LDO5V = 5V

2.2 IO Input/Output Electrical Logical Characteristics

Table 2-2

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

2.3 Internal Resistor Characteristics

Table 2-3

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA0 PA3~PA5 PC1 PC3~PC5	8mA	24mA	10K	10K	1、USBDM & USBDP default pull down 2、internal pull-up/pull-down resistance | accuracy ±20% 3、PR1 default output 0 4、PR2 default pull up
PB0~PB6	4mA	8mA	10K	10K	
PR1 PR2	8mA	10mA	10K	10K	
USBDM USBDP	4mA	_	1.5K	15K	

2.4 DAC Characteristics

Table 2-4

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	_	20K	Hz	
THD+N	_	-69	_	dB	1KHz/0dB
S/N	_	95	_	dB	10Kohm loading
Crosstalk	_	-80	_	dB	With A-Weighted Filter
Output Swing		1		Vrms	
Dynamic Range		90		dB	1KHz/-60dB 10Kohm loading With A-Weighted Filter
DAC Output Power	11		_	mW	32ohm loading

2.5 ADC Characteristics

Table 2-5

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range		85		dB	1KHz/-60dB 10Kohm loading With A-Weighted Filter
S/N	_	90	_	dB	1KHz/-60dB
THD+N	_	-72	_	dB	10Kohm loading
Crosstalk	_	-80	_	dB	With A-Weighted Filter

2.6 BT Characteristics

2.6.1 Transmitter

Basic Data Rate **Table 2-6**

Parameter		Min	Typ	Max	Unit	Test Conditions
RF Transmit Power			0	4	dBm	
RF Power Control Range			20		dB	25℃,
20dB Bandwidth			950		KHz	Power Supply
Adjacent Channel Transmit Power	+2MHz		-40		dBm	Voltage=5V
	-2MHz		-38		dBm	
	+3MHz		-44		dBm	2441MHz
	-3MHz		-35		dBm	

Enhanced Data Rate **Table 2-7**

Parameter		Min	Typ	Max	Unit	Test Conditions
Relative Power			1.2		dB	25℃, Power Supply Voltage=5V 2441MHz
π/4 DQPSK Modulation Accuracy	DEVM RMS		6		%	
	DEVM 99%		10		%	
	DEVM Peak		15		%	
Adjacent Channel Transmit Power	+2MHz		-40		dBm	
	-2MHz		-38		dBm	
	+3MHz		-44		dBm	
	-3MHz		-35		dBm	

2.6.2 Receiver

Basic Data Rate **Table 2-8**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-89		dBm	25℃, Power Supply Voltage=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Interference Rejection	+1MHz		+5		dB	
	-1MHz		+2		dB	
	+2MHz		+37		dB	
	-2MHz		+36		dB	
	+3MHz		+40		dB	
	-3MHz		+35		dB	

Enhanced Data Rate **Table 2-9**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-89		dBm	25℃, Power Supply Voltage=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Interference Rejection	+1MHz		+5		dB	
	-1MHz		+2		dB	
	+2MHz		+37		dB	
	-2MHz		+36		dB	
	+3MHz		+40		dB	
	-3MHz		+35		dB	

2.7 FM Receiver Characteristics

Table 2-10

Parameter	Min	Typ	Max	Unit	Test Conditions
Input Frequency	76		108	MHz	
Usable Sensitivity	3	4	8	dBμV EMF	(S+N)/N=26dB
Adjacent Channel Selectivity		48		dB	± 200kHz
IIP3		88		dbμV EMF	Δf1=200 kHz, Δf2=400 kHz
Audio Output Voltage	0		3	V	Empty load
Audio Frequency Response	20		20k	Hz	DAC test
Audio (S+N)/N		52		dB	
Stereo Separation		40		dB	
Audio Total Harmonic Distortion (THD)		0.4		%	

3、Package Information

3.1 QFN32(4mm*4mm)

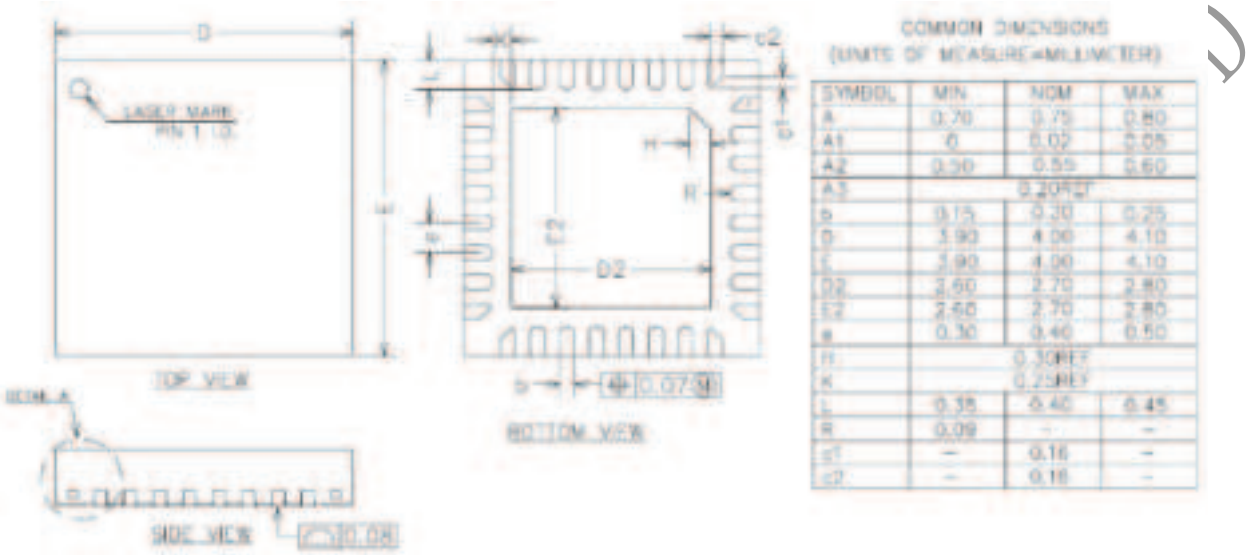

Figure 3-1. AC6926A_QFN32 Package

4、Revision History

Date	Revision	Description
2018.04.20	V1.0	Initial Release

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
The module in this product is labeled with its own FCC ID. The FCC ID is not visible when the module is installed inside another device. Therefore, the outside of the device into which the module is installed must also display a label referring to the module. The final end device must be labeled in a visible area with the following “Contains FCC ID: 2BFCG-BLE”