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AC6939B Datasheet

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Zhuhai Jieli Technology Co.,LTD

Version: 1.3

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AC6939B Datasheet

AC6939B Features**High performance 32-bit RISC CPU**

- DC-160MHz operation
- With 16k read only cache
- 64Vectored interrupts
- 8 Levels interrupt priority
- Coprocessor with mathematic instructions

Flexible I/O

- 4 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 in all working conditions
- Long press reset on all GPIOs

Peripheral Feature

- One full speed USB 2.0 OTG controller
- Hardware universal algorithm accelerator for FFT and AEC
- Four multi-function 16-bit timers, support capture and PWM mode
- Three 16-bit PWM generator for motor driving with automatic stop protection
- One full-duplex basic UART
- Two full-duplex advanced UART with DMA
- One IIC interface supports host and device mode
- One Quadrate decoder
- One LED light controller
- Watchdog
- One 12/24Mhz Crystal Oscillator
- Hardware Audio algorithm accelerator
- 16-bit Stereo DAC with headphone amplifier, SNR >= 96dB
- 1 channels ADC , SNR >= 85dB
- 1 channel MIC amplifier
- 1 channel analog MUX
- 4 channels 10-bit ADC
- 2 channels 8 levels Low Voltage Detector
- Power-on reset
- Embedded PMU support low power mode
- Integrated Li-ion battery charger, up to supports 150mA fast charging
- Communication with TWS headset charging case

Bluetooth Feature

- CMOS single-chip fully-integrated radio and baseband

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- Bluetooth V5.0+BR+EDR+BLE specification
- Bluetooth Piconet and Scatternet support
- Meet class2 and class3 transmitting power requirement
- Support 1M GFSK\2M GFSK\S2 CODE\S8 CODE\π/4 DQPSK all packet types
- Provides +4dbm transmitting power
- receiver with -90dBm sensitivity
- Support a2dp\avctp\avdtp\avrcp\hfp\spp\smp\att\gap\gatt\rfcomm\sdp\l2cap profile

Power Supply

- VBAT is 2.2V to 4.2V
- VDDIO is 2.2V to 3.6V

Package

- SOP16

Temperature

- Operating temperature range: -40°C to +80°C
- Storage temperature range: -65°C to +150°C

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VDDIO	1	16	PA1
VBAT	2	15	DACVSS
LDO_IN	3	14	DACL
BT_AVDD	4	13	DACR
PB2	5	12	USBDP/PA3
PB1	6	11	USBDM
BT_RF	7	10	BT_OSCO
VSSIO	8	9	BT_OSCI

Figure 1-1 AC6939B_SOP16 Package Diagram

1.2 Pin Description

Table 1-1 AC6939B_SOP16 Pin Description

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
1	VDDIO	P	/	IO Power 3.3v	
2	VBAT	P	/	LDO Power	
3	LDO_IN	P	/	Charge Power 5v	
4	BT_AVDD	P	/	BT Power 1.3v	
5	PB2	I/O		GPIO	ADC12: ADC Input Channel12;
6	PB1	I/O		GPIO (pull up)	Long Press Reset; ADC6: ADC Input Channel6;
7	BT_RF	P	/		
8	VSSIO	P	/	Ground	
9	BT_OSCI	I	/	OSC In	
10	BT_OSCO	O	/	OSC Out	
11	USBDM	I/O	4	USB Negative Data	UART1RXD: Uart1 Data In(D); IIC_SDA_A: IIC SDA(A); ADC11: ADC Input Channel 11;
12	USBDP	I/O	4	USB Positive Data	UART1TXD: Uart1 Data Out(D); IIC_SCL_A: IIC SCL(A); ADC10: ADC Input Channel 10;
	PA3	I/O		GPIO	AMUX1L: Simulator Channel1 Left; ADC1: ADC Input Channel1; UART2TXA: Uart2 Data Output(A); PWMCH0L: Motor PWM Channel0 (L)
13	DACR	O	/	DAC Right Channel	
14	DACL	O	/	DAC Left Channel	
15	DACVSS	P	/	Ground	
16	PA1	I/O	24	GPIO	MIC: MIC Input Channel ; PWM0: Timer0 PWM Output; ADC0: ADC Input Channel0; UART1TXC: Uart1 Data Output(C); PWMCH0H: Motor PWM Channel0 (H)

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2、Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+80	°C
Tstg	Storage temperature	-65	+150	°C
VBAT	Supply Voltage	-0.3	5.5	V
V _{3.3IO}	3.3V IO Input Voltage	-0.3	VDDIO+0.3	V
LDOIN	Charge Input Voltage	-0.3	5.5	V

2.2 PMU Characteristics

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
LDOIN	Voltage Input	4.5	5	5.5	V	—
VBAT	Voltage Input	2.2	3.7	5.5	V	—
V _{DVDD}	Voltage output	0.9	1.2	1.25	V	VBAT = 4.2V, 30mA loading
V _{3.3}	Voltage output	—	3.3	—	V	VBAT = 4.2V, 100mA loading
V _{BT_AVDD}	Voltage output	—	1.3	—	V	VBAT=4.2V, 100mA loading
V _{DACVDD}	DAC Voltage	—	3.1	—	V	VBAT = 4.2V, 10mA loading
I _{L3.3}	Loading current	—	—	150	mA	VBAT = 4.2V

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 _{Charge}	Charge Voltage	4.15	4.2	4.25	V	—
I _{Charge}	Charge Current	20	—	200	mA	Charge current at fast charge mode
I _{Trickl}	Trickle Charge Current	20	45	70	mA	V _{BAT} < V _{Trickl}

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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_{IL}	Low-Level Input Voltage	-0.3	—	$0.3 \cdot V_{DDIO}$	V	$V_{DDIO} = 3.3V$
V_{IH}	High-Level Input Voltage	$0.7 \cdot V_{DDIO}$	—	$V_{DDIO} + 0.3$	V	$V_{DDIO} = 3.3V$
IO output characteristics						
V_{OL}	Low-Level Output Voltage	—	—	0.33	V	$V_{DDIO} = 3.3V$
V_{OH}	High-Level Output Voltage	2.7	—	—	V	$V_{DDIO} = 3.3V$

2.5 Internal Resistor Characteristics

Table 2-5

Port	Driving (mA)				Internal Pull-Up Resistor (kΩ)	Internal Pull-Down Resistor (kΩ)	Comment
PA1 PA1,PA3 PB1,PB2	3	8	18	24	10	10	1、USBDM & USBDP default pull down 2、internal pull-up/pull-down resistance accuracy $\pm 20\%$
USBDP	4				1.5	15	
USBDM					180	15	

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	—	-74	—	dB	
S/N	—	96	—	dB	
Crosstalk	—	-60	—	dB	
Output Swing	—	0.95	—	Vrms	1KHz/-60dB 10Kohm loading With A-Weighted Filter
Dynamic Range	—	94	—	dB	
DAC Output Power	11	18	—	mW	

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2.7 ADC Characteristics

Table 2-7

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range		82		dB	1KHz/-60dB 10Kohm loading With A-Weighted Filter
S/N	—	90	—	dB	1KHz/-60dB
THD+N	—	-64	—	dB	10Kohm loading
Crosstalk	—	-80	—	dB	With A-Weighted Filter

2.8 BT Characteristics

2.8.1 Transmitter

Basic Data Rate

Table 2-8-1

Parameter	Min	Typ	Max	Unit	Test Conditions
RF Transmit Power		0	4	dBm	25℃, Power Supply VBAT=5V 2441MHz
RF Power Control Range		28		dB	
20dB Bandwidth		950		KHz	
Adjacent Channel	+2MHz	-40		dBm	
	-2MHz	-38		dBm	
Transmit Power	+3MHz	-44		dBm	
	-3MHz	-35		dBm	

Enhanced Data Rate

Table 2-8-2

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

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2.8.2 Receiver**Basic Data Rate****Table 2-8-3**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25°C, Power Supply VBAT=5V 2441MHz
Co-channel Interference Rejection			-10		dB	
Adjacent Channel	+1MHz		+4		dB	
	-1MHz		+4		dB	
	+2MHz		+34		dB	
Interference Rejection	-2MHz		+34		dB	
	+3MHz		+44		dB	
	-3MHz		+25		dB	

Enhanced Data Rate**Table 2-8-4**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25°C, Power Supply VBAT=5V 2441MHz
Co-channel Interference Rejection			-10		dB	
Adjacent Channel	+1MHz		+4		dB	
	-1MHz		+4		dB	
	+2MHz		+34		dB	
Interference Rejection	-2MHz		+34		dB	
	+3MHz		+44		dB	
	-3MHz		+25		dB	

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3、 Package Information

3.1 SOP16

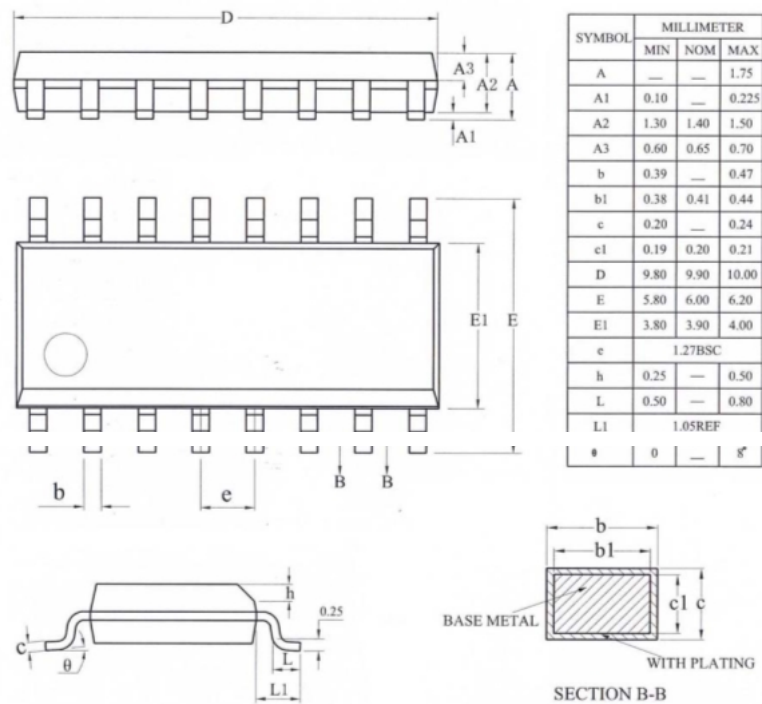


Figure 3-1 AC6939B_SOP16 Package

4、Revision History

Date	Revision	Description
2019.03.01	V1.0	Initial Release
2019.03.25	V1.1	Modify Electrical Characteristics
2019.04.01	V1.2	Modify BT Characteristics
2019.04.01	V1.3	Modify Bluetooth Support Paket Types

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