

AC6328A Datasheet

Zhuhai Jieli Technology Co.,LTD

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AC6328A Features

High performance 32-bit RISC CPU

- RISC 32-bit CPU
- DC-96MHz operation
- 73KB data RAM
- 8KB I-cache 2way
- 1KB Rocache 1way
- 64 Vectored interrupts
- 8 Levels interrupt priority

Flexible I/O

- 3 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 OTG controller
- Four Multi-function 32-bit timers, support capture and PWM mode
- Three full-duplex advanced UART(DMA)
- One IIC interface supports host and device mode
- 16-bit PWM generator for motor driving
- 3 channels 10-bit ADC
- 1 channel 8 levels Low Power Detector

- Embedded PMU support low power mode
- Watchdog
- Power-on reset

Bluetooth Feature

- CMOS single-chip fully-integrated radio and baseband
- Compliant with Bluetooth V5.4+BR+EDR+BLE specification
- Bluetooth Piconet and Scatternet support
- Meet class2 and class3 transmitting power requirement
- Support GFSK and $\pi/4$ DQPSK all packet types
- Maximum +8dBm transmitting power
- EDR receiver with -93dBm sensitivity
- Support a2dp\avctp\avdtp\avrcp\hfp\spp\smp\att\gap\gatt\rfcomm\sdpl2cap profile

Power Supply

- VDDIO is 1.8V to 3.4V

Packages

- SOP8

Temperature

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

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1. Block Diagram

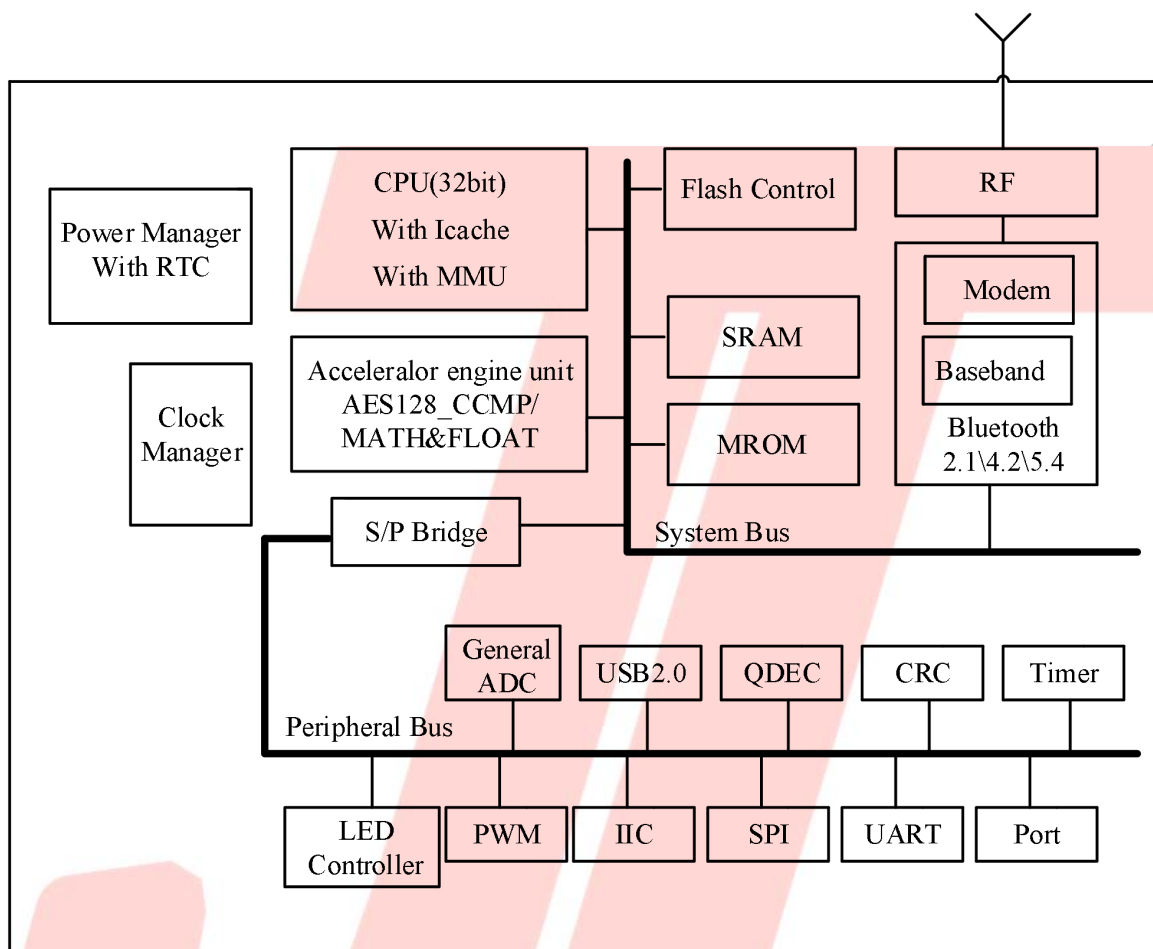


Figure 1-1 AC6328A_SOP8 Block Diagram

2. Pin Definition

2.1 Pin Assignment

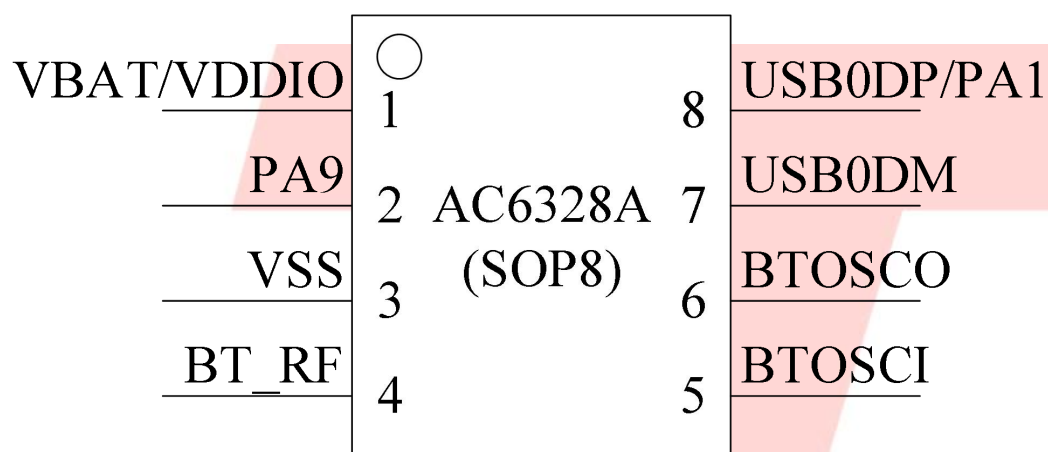


Figure 2-1 AC6328A_SOP8 Package Diagram

2.2 Pin Description

Table 2-1 AC6328A_SOP8 Pin Description

PIN NO.	Name	I/O Type	Function	Other Function
1	VBAT	P	LDO Power	-
	VDDIO	P	IO Power 3.3V	-
2	PA9	I/O	GPIO (pull up)	Long Press Reset; ADC8: ADC Channel 8;
3	VSS	P	GND	-
4	BT_RF	-	RF Antenna	-
5	BTOSCI	I	BTOSCI	-
6	BTOSCO	O	BTOSCO	-
7	USB0DM	I/O	GPIO (pull down)	IIC_SDA_A: IIC SDA(A); ADC11: ADC Channel 11; UART1_RXD: Uart1 Data In(D);
8	USB0DP	I/O	GPIO (pull down)	IIC_SCL_A: IIC SCL(A); ADC10: ADC Channel 10; UART1_TXD: Uart1 Data Out(D);
	PA1	I/O	GPIO	PWM0: Timer0 PWM Output; ADC0: ADC Channel 0; UART0_TXC: Uart0 Data Out(C);

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3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Table 3-1

Symbol	Parameter	Min	Max	Unit
T _{opt}	Operating temperature	-40	+85	°C
T _{stg}	Storage temperature	-65	+150	°C
V _{VDDIO}	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

3.2 Recommended Operating Conditions

Table 3-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V _{VDDIO}	Voltage Input	1.8	3.0	3.4	V	

3.3 IO Input/Output Electrical Logical Characteristics

Table 3-3

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

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3.4 Internal Resistor Characteristics

Table 3-4

Port	Drive Strength	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA1, PA9	drive_select[11] 24mA drive_select[10] 24mA (with 120ohm res) drive_select[01] 8mA drive_select[00] 8mA (with 120ohm res)	10K	10K	1. PA9 default pull up 2. USB0DM&USB0DP default pull down 3. Internal pull-up/pull-down resistance accuracy $\pm 20\%$
USB0DP	4mA	1.5K	15K	
USB0DM	4mA	180K	15K	

3.5 BT Characteristics

3.5.1 Transmitter

Basic Rate

Table 3-5

Parameter	Min	Typ	Max	Unit	Test Conditions	
RF Transmit Power	-	4	6	dBm	25°C, Power Supply	
RF Power Control Range	-	20	-	dB		
20dB Bandwidth	-	950	-	KHz		
In-band spurious Emissions (BQB Test Mode RF_Tx Power=4dBm)	F=F ₀ ±1MHz	-	-20	-	dBm	VBAT=3.7V 2441MHz
	F=F ₀ ±2MHz	-	-45	-	dBm	
	F=F ₀ ±3MHz	-	-35	-	dBm	DH5
	F=F ₀ ±>3MHz	-	-40	-	dBm	

Enhanced Data Rate

Table 3-6

Parameter	Min	Typ	Max	Unit	Test Conditions	
Relative Power	-	-1	-	dB	25°C, Power Supply	
$\pi/4$ DQPSK Modulation Accuracy	DEVM RMS	-	4	-		%
	DEVM 99%	-	12	-		%
In-band spurious Emissions (BQB Test Mode RF_Tx Power=4dBm)	DEVM Peak	-	9	-	%	VBAT=3.7V 2441MHz
	F=F ₀ ±1MHz	-	-4	-	dBm	
	F=F ₀ ±2MHz	-	-30	-	dBm	2DH5
	F=F ₀ ±3MHz	-	-30	-	dBm	
F=F ₀ ±>3MHz	-	-37	-	dBm		

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3.5.2 Receiver

Basic Rate

Table 3-7

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-91	-	dBm	25°C, Power Supply VBAT=3.7V 2441MHz DH5
Co-channel Interference Rejection		-	6	-	dB	
Adjacent Channel selectivity C/I	+1MHz	-	-7	-	dB	
	-1MHz	-	-7	-	dB	
	+2MHz	-	-37	-	dB	
	-2MHz	-	-39	-	dB	
	+3MHz	-	-32	-	dB	
	-3MHz	-	-43	-	dB	

Enhanced Data Rate

Table 3-8

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-93	-	dBm	25°C, Power Supply VBAT=3.7V 2441MHz 2DH5
Co-channel Interference Rejection		-	8	-	dB	
Adjacent Channel selectivity C/I	+1MHz	-	-14	-	dB	
	-1MHz	-	-15	-	dB	
	+2MHz	-	-36	-	dB	
	-2MHz	-	-39	-	dB	
	+3MHz	-	-29	-	dB	
	-3MHz	-	-43	-	dB	

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3.5.3 BLE

1M Data Rate

Table 3-9

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-95	-	dBm	25°C Power Supply VBAT=3.7V 2440MHz
RF Transmit Power		-	6.5	8	dBm	
In-band Spurious Emission	$ M-N =2\text{MHz}$	-	-35	-	dBm	
	$ M-N \geq 3\text{MHz}$	-	-33	-	dBm	
Modulation Characteristics	$\Delta f1$ avg	-	250	-	KHz	
	$\Delta f2$ 99%	-	210	-	KHz	
	$\Delta f1\text{avg}/\Delta f2\text{avg}$	-	0.9	-	/	
Carrier Frequency Offset		-15	-	+15	KHz	
Frequency Drift		-25	-	+25	KHz	
Frequency Drift Rate		-5	-	+5	KHz/50us	

2M Data Rate

Table 3-10

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-92	-	dBm	25°C Power Supply VBAT=3.7V 2440MHz
RF Transmit Power		-	6.5	8	dBm	
In-band Spurious Emission	$ M-N =4\text{MHz}$	-	-40	-	dBm	
	$ M-N =5\text{MHz}$	-	-40	-	dBm	
	$ M-N \geq 6\text{MHz}$	-	-40	-	dBm	
Modulation Characteristics	$\Delta f1$ avg	-	500	-	KHz	
	$\Delta f2$ 99%	-	430	-	KHz	
	$\Delta f1\text{avg}/\Delta f2\text{avg}$	-	0.9	-	/	
Carrier Frequency Offset		-20	-	+20	KHz	
Frequency Drift		-25	-	+25	KHz	
Frequency Drift Rate		-5	-	+5	KHz/50us	

Long Range

Table 3-11

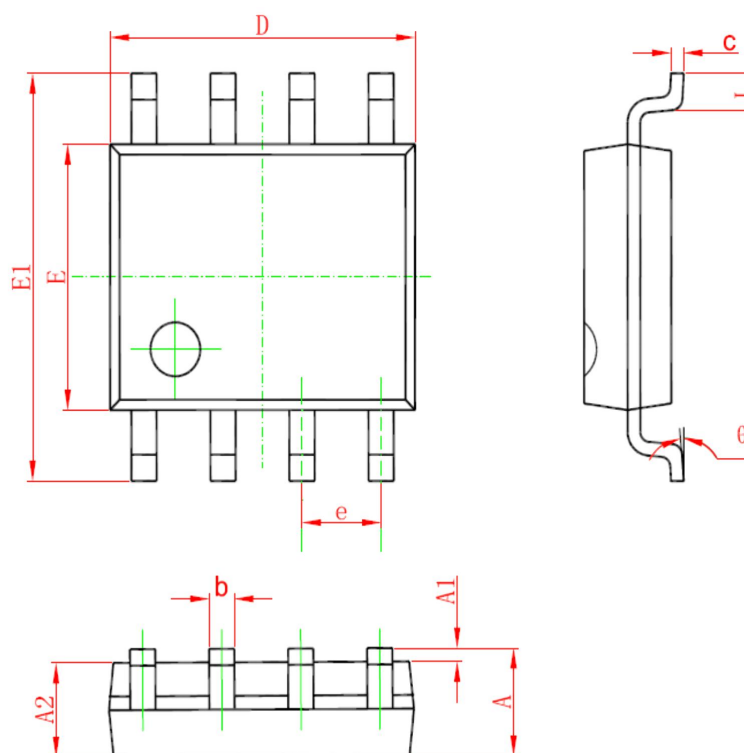
Parameter	Min	Typ	Max	Unit	Test Conditions
Sensitivity LE 125K(S8)	-	-102	-	dBm	VBAT=3.7V,25°C
Sensitivity LE 500K(S2)	-	-99	-	dBm	2440MHz

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4. Package Information

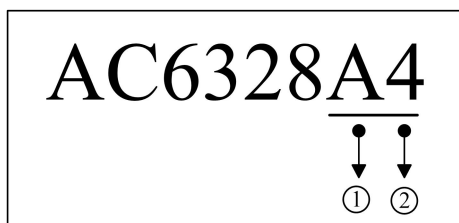
4.1 SOP8(4.9mm*3.9mm)



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0° to 8°		0° to 8°	

Figure 4-1 AC6328A_SOP8 Package

5. Package Type Specification



- ① Represents different packages
- ② Represents different memory sizes
 - 2: 2Mbit Flash
 - 4: 4Mbit Flash

6. Revision History

Date	Revision	Description
2021.03.04	V1.0	Initial Release
2022.07.19	V1.1	Update Bluetooth Feature
2023.04.24	V1.2	Update The Package
2023.11.28	V1.3	Add BLE parameter
2023.12.13	V1.4	Update Bluetooth Feature